



**Conformance Statement**

**SurgeryWorkstation**

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## 1. Introduction

### 1.1. Revision History

Version	Date	Author	Changes
1.0	Oct 2011	tb	Initial draft

### 1.2. Intended Audience

This document is intended for the following:

- Potential users
- System integrators of medical equipment

It is assumed that the reader is familiar with the DICOM standard.

### 1.3. Scope and field of application

This document describes SurgeryWorkstation conformance to the DICOM 3.0 Standard. This statement is conformant with the recommended format as described in PS 3.2 of the DICOM standard.

SurgeryWorkstation acts as an SCU for the following SOP Classes:

- Verification
- Storage
- Basic Modality Worklist Management

### 1.4. Remarks

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

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

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

The user should be aware of the following important issues:

- Test procedures should be defined to validate the desired level of connectivity.
- The DICOM standard will evolve to meet the users' future requirements.

### 1.5. Definitions

The following acronyms are used in this document.

- AE DICOM - Application Entity
- AET - Application Entity Title
- DICOM - Digital Imaging and Communication in Medicine
- DIMSE - DICOM Message Service Element
- ISO - International Standard Organization
- LUT - Look-up Table
- NEMA - National Electrical Manufacturers Association
- PDU - Protocol Data Unit
- SCP - Storage Class Provider
- SCU - Storage Class User
- SOP - Service Object Pair
- TCP/IP - Transmission Control Protocol/Internet Protocol
- TLS - Transport Layer Security
- UID - Unique Identifier
- VR - Value Representation

### **1.6. References**

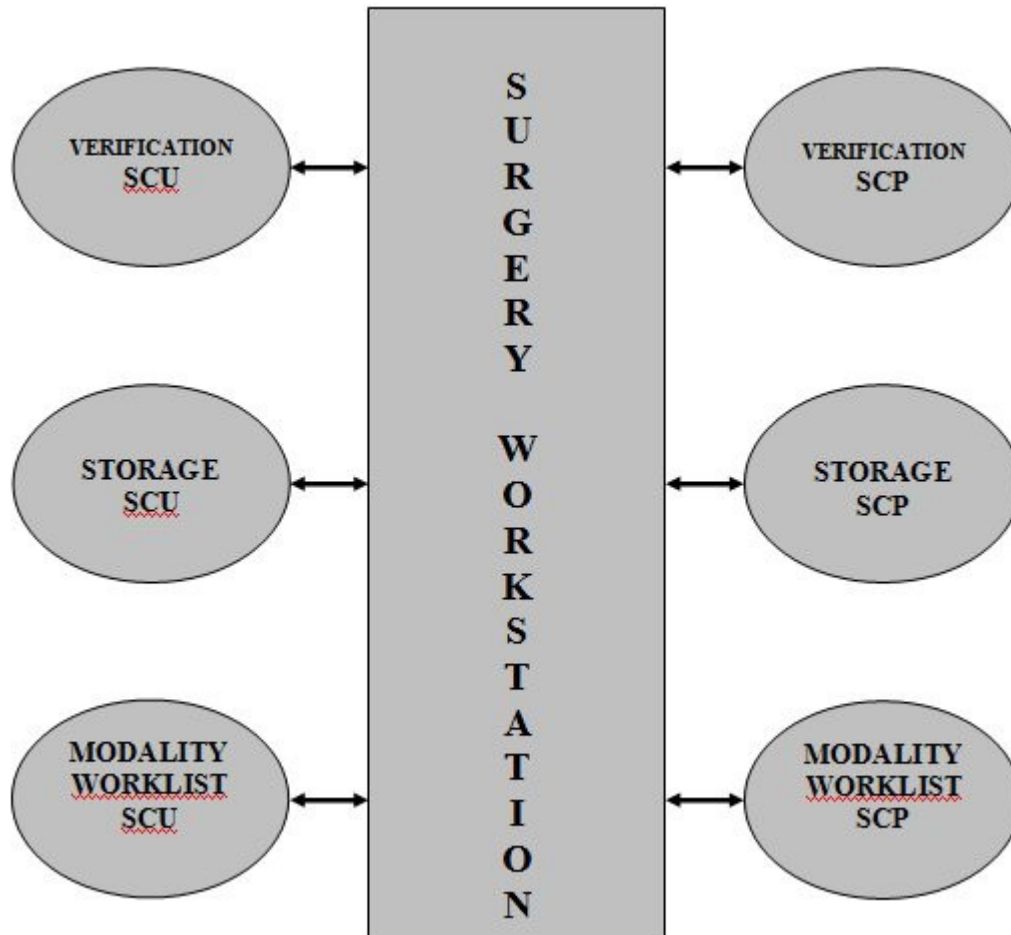
The Digital Imaging and Communication in Medicine (DICOM) Standard, NEMA: PS3.1 – PS3.14 and Supplements.

## **2. Implementation Model**

SurgeryWorkstation is a Windows application that captures still images and converts them into DICOM Part 10 compliant files. SurgeryWorkstation can send or print these images to remote equipment using the DICOM protocol.

SurgeryWorkstation can also record video files and converts these files into DICOM Part 10 compliant files. These files can also be sent to remote equipment using the DICOM protocol. SurgeryWorkstation uses the DICOM Worklist Management service to populate information in generated DICOM datasets.

## 2.1. Application Data Flow Diagram



*SurgeryWorkstation Data Flow Diagram*

## 2.2. Functional Definitions of Application Entities

Each SurgeryWorkstation acts as a single Application Entity and so there will be a maximum of one association per connected remote SCP.

### 2.2.1. Verification Service as SCU

SurgeryWorkstation supports the Echo (Verification) service as SCU.

### 2.2.2. Storage Service as SCU

To store images and video, SurgeryWorkstation establishes a connection with the remote storage SCP, negotiates the presentation contexts and sends all images and video according to their related Storage SOP Class.

### 2.2.3. Modality Worklist Service as SCU

SurgeryWorkstation uses the Basic Worklist Management service to get required information so that DICOM files can be added to an existing study. It establishes one association with the remote Worklist SCP, performs a Find request, waits for a response and then releases the association.

## 3. Overview

SurgeryWorkstation is a suite of applications that provides services for storage and retrieve of DICOM evidence object such Images, Key Image Notes, Presentation States, Structured Reports and others.

SurgeryWorkstation supports the following network services:

Table 1. Network Services

Networking SOP Classes	User of Service (SCU)	Provider of Service (SCP)
<i>Transfer</i>		
Basic Study Content Notification SOP Class (Retired)	Yes	Yes
Stored Print Storage SOP Class (Retired)	Yes	Yes
Hardcopy Grayscale Image Storage SOP Class (Retired)	Yes	Yes
Hardcopy Color Image Storage SOP Class (Retired)	Yes	Yes
Computed Radiography Image Storage	Yes	Yes
Digital X-Ray Image Storage - For Presentation	Yes	Yes
Digital X-Ray Image Storage - For Processing	Yes	Yes
Digital Mammography X-Ray Image Storage - For Presentation	Yes	Yes
Digital Mammography X-Ray Image Storage - For Processing	Yes	Yes
Digital Intra-oral X-Ray Image Storage - For Presentation	Yes	Yes
Digital Intra-oral X-Ray Image Storage - For Processing	Yes	Yes
Standalone Modality LUT Storage (Retired)	Yes	Yes
Encapsulated PDF Storage	Yes	Yes
Encapsulated PDF Storage	Yes	Yes
Encapsulated CDA Storage	Yes	Yes
Standalone VOI LUT Storage (Retired)	Yes	Yes
Grayscale Softcopy Presentation State Storage SOP Class	Yes	Yes
Color Softcopy Presentation State Storage SOP Class	Yes	Yes
Pseudo-Color Softcopy Presentation State Storage SOP Class	Yes	Yes
Blending Softcopy Presentation State Storage SOP Class	Yes	Yes
X-Ray Angiographic Image Storage	Yes	Yes

Enhanced XA Image Storage	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	Yes	Yes
Enhanced XRF Image Storage	Yes	Yes
X-Ray Angiographic Bi-Plane Image Storage (Retired)	Yes	Yes
Positron Emission Tomography Image Storage	Yes	Yes
Standalone PET Curve Storage (Retired)	Yes	Yes
CT Image Storage	Yes	Yes
Enhanced CT Image Storage	Yes	Yes
Nuclear Medicine Image Storage	Yes	Yes
Ultrasound Multi-frame Image Storage (Retired)	Yes	Yes
Ultrasound Multi-frame Image Storage	Yes	Yes
MR Image Storage	Yes	Yes
Enhanced MR Image Storage	Yes	Yes
MR Spectroscopy Storage	Yes	Yes
RT Image Storage	Yes	Yes
RT Dose Storage	Yes	Yes
RT Structure Set Storage	Yes	Yes
RT Beams Treatment Record Storage	Yes	Yes
RT Plan Storage	Yes	Yes
RT Brachy Treatment Record Storage	Yes	Yes
RT Treatment Summary Record Storage	Yes	Yes
Nuclear Medicine Image Storage (Retired)	Yes	Yes
Ultrasound Image Storage (Retired)	Yes	Yes
Ultrasound Image Storage	Yes	Yes
Raw Data Storage	Yes	Yes
Spatial Registration Storage	Yes	Yes
Spatial Fiducials Storage	Yes	Yes
Real World Value Mapping Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage	Yes	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	Yes	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	Yes	Yes
VL Image Storage - Trial (Retired)	Yes	Yes
VL Endoscopic Image Storage	Yes	Yes
Video Endoscopic Image Storage	Yes	Yes



VL Microscopic Image Storage	Yes	Yes
Video Microscopic Image Storage	Yes	Yes
VL Slide-Coordinates Microscopic Image Storage	Yes	Yes
VL Photographic Image Storage	Yes	Yes
Video Photographic Image Storage	Yes	Yes
Ophthalmic Photography 8 Bit Image Storage	Yes	Yes
Ophthalmic Photography 16 Bit Image Storage	Yes	Yes
Stereometric Relationship Storage	Yes	Yes
VL Multi-frame Image Storage - Trial (Retired)	Yes	Yes
Standalone Overlay Storage (Retired)	Yes	Yes
Basic Text SR Storage	Yes	Yes
Enhanced SR Storage	Yes	Yes
Comprehensive SR Storage	Yes	Yes
Procedure Log Storage	Yes	Yes
Mammography CAD SR Storage	Yes	Yes
Key Object Selection Document Storage	Yes	Yes
Chest CAD SR Storage	Yes	Yes
X-Ray Radiation Dose SR Storage	Yes	Yes
Standalone Curve Storage (Retired)	Yes	Yes
12-lead ECG Waveform Storage	Yes	Yes
General ECG Waveform Storage	Yes	Yes
Ambulatory ECG Waveform Storage	Yes	Yes
Hemodynamic Waveform Storage	Yes	Yes
Cardiac Electrophysiology Waveform Storage	Yes	Yes
Basic Voice Audio Waveform Storage	Yes	Yes
Hanging Protocol Storage	Yes	Yes
Siemens CSA Non-Image Storage	Yes	Yes
<i>Workflow Management</i>		
Modality Worklist – FIND	Yes	No
<i>Connectivity Verification</i>		
Verification	No	Yes

## 4. Networking

### 4.1. Implementation Model

The SurgeryWorkstation is logically divided into 3 different DICOM Application Entities: Storage Server, Storage Client and Modality Worklist Client.

These Application Entities are all Java Applications and are designed to run on any Java Virtual Machine 1.4 capable Operating System. Wrappers are included that convert these applications to Windows and Unix shell scripts.

#### **4.1.2. Functional Definition of Aes**

##### ***4.1.2.1. Functional Definition of Storage Server Application Entity***

The SurgeryWorkstation Storage Server Application Entity waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, the STORAGE SCP AE expects it to be a DICOM application.

The STORAGE SCP AE will accept Associations with Presentation Contexts for SOP Classes of the Verification and Storage Service Classes. It might request an accompanying Association of the Storage Commitment Service Class.

DICOM Instances received in a Storage Request are filed on the local (attached/mounted) file system. No any attributes from received Instances are stored anywhere.

##### ***4.1.2.2. Functional Definition of Storage Client Application Entity***

The SurgeryWorkstation Storage Client Application Entity is a STORAGE SCU. It connects to the presentation address configured as the Called Application Entity Title and establishes an Association with Presentation Context of the Storage Service Class. Then it sends any supported DICOM Instances specified by the operator, over a Storage Request.

If a Storage Commitment is requested by the operator, the STORAGE SCU AE will itself accept Associations with Presentation Contexts for SOP Classes of the Storage Commitment Service Class.

##### ***4.1.2.3. Functional Definition of Modality Worklist Client Application Entity***

The SurgeryWorkstation Modality Worklist Client Application Entity connects at the presentation address given as a Called Application Entity Title. It will propose Associations with Presentation Context for SOP Class of the Modality Worklist Service Class.

When a WORKLIST-FIND request is sent, Modality Worklist Client AE will wait on the same Association for a C-FIND response and then provide to the operator the set of worklist items matching the query request.

#### **4.2. AE Specifications**

##### **4.2.1. Storage Server Application Entity Specification**

###### **4.2.1.1. SOP Classes**

SurgeryWorkstation Storage Server Application Entity provides Standard Conformance to the following SOP Classes:

*Table 2. SOP Classes for SurgeryWorkstation Storage Server AE*

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	No	Yes
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	No	Yes
Basic Study Content Notification SOP Class (Retired)	1.2.840.10008.1.9	No	Yes
Stored Print Storage SOP Class (Retired)	1.2.840.10008.5.1.1.27	No	Yes
Hardcopy Grayscale Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.29	No	Yes
Hardcopy Color Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.30	No	Yes
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	No	Yes
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	No	Yes
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	No	Yes
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	No	Yes
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	No	Yes
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	No	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.10.4.1	No	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.10.4.1	No	Yes
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.10.4.2	No	Yes
Standalone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	No	Yes
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	No	Yes
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	No	Yes
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	No	Yes
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	No	Yes

SOP Class	4		
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Yes
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	No	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	No	Yes
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	No	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.12.8	No	Yes
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.9	No	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	No	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	No	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	No	Yes
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	No	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	No	Yes
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	No	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.48.1.1	No	Yes
RT Dose Storage	1.2.840.10008.5.1.4.1.1.48.1.2	No	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.48.1.3	No	Yes
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.48.1.4	No	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.48.1.5	No	Yes
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.48.1.6	No	Yes
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.48.1.7	No	Yes
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	No	Yes
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	No	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes

Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	No	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	No	Yes
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	No	Yes
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	No	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	No	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	No	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	No	Yes
VL Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.1	No	Yes
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	No	Yes
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	No	Yes
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	No	Yes
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	No	Yes
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	No	Yes
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	No	Yes
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	No	Yes
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	No	Yes
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	No	Yes
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	No	Yes
VL Multi-frame Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.2	No	Yes
Standalone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	No	Yes
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.	No	Yes

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Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	No	Yes
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	No	Yes
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	No	Yes
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	No	Yes
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	No	Yes
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	No	Yes
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	No	Yes
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9	No	Yes
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	No	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	No	Yes
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	No	Yes
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	No	Yes
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	No	Yes
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	No	Yes
Hanging Protocol Storage	1.2.840.10008.5.1.4.38.1	No	Yes
Siemens CSA Non-Image Storage	1.3.12.2.1107.5.9.1	No	Yes

#### **4.2.1.2. Association Establishment Policy**

##### **4.2.1.2.1. General**

The SurgeryWorkstation Storage Server AE can accept Association Requests for the Verification and Storage Services. It may propose Association Requests for the Storage Commitment Service.

The DICOM standard application context name for DICOM 3.0 is always accepted and

proposed:

*Table 3. DICOM application context name for SurgeryWorkstation Storage Server AE*

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

#### 4.2.1.2.2. Implementation Identifying Information

The implementation information for this Application Entity is:

*Table 4. DICOM Implementation Class and Version for SurgeryWorkstation Storage Server AE*

Implementation Class UID	1.2.40.0.13.1.1
Implementation Version Name	dcm4che-2.0

#### 4.2.1.2.3. Accepted Presentation Contexts

*Table 5. Accepted Presentation Contexts for SurgeryWorkstation Storage Server AE*

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Transfer Syntaxes for Non-Image Storage Services		SCU	None
Basic Study Content Notification SOP Class (Retired)	1.2.840.10008.1.9	Transfer Syntaxes for Image Storage Services		SCP	None
Stored Print Storage SOP Class (Retired)	1.2.840.10008.5.1.1.27	Transfer Syntaxes for Image Storage Services		SCP	None
Hardcopy Grayscale Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.29	Transfer Syntaxes for Image Storage Services		SCP	None
Hardcopy Color Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.30	Transfer Syntaxes for Image Storage Services		SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Transfer Syntaxes for Image Storage Services		SCP	None

Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Transfer Syntaxes for Image Storage Services	SCP	None
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Transfer Syntaxes for Image Storage Services	SCP	None
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Transfer Syntaxes for Image Storage Services	SCP	None
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Standalone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Transfer Syntaxes for Non-Image Storage Services	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Transfer Syntaxes for Image Storage Services	SCP	None
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Transfer Syntaxes for Image Storage Services	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Transfer Syntaxes for Image Storage Services	SCP	None
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Transfer Syntaxes for Image Storage Services	SCP	None
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Transfer Syntaxes for Image Storage Services	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Transfer Syntaxes for Image Storage Services	SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.	Transfer Syntaxes for	SCP	None



(Retired)	1.4.1.1.129	Non-Image Storage Services		e
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Transfer Syntaxes for Image Storage Services	SCP	Non e
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Transfer Syntaxes for Image Storage Services	SCP	Non e
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Transfer Syntaxes for Image Storage Services	SCP	Non e
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Transfer Syntaxes for Image Storage Services	SCP	Non e
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Transfer Syntaxes for Image Storage Services	SCP	Non e
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Transfer Syntaxes for Image Storage Services	SCP	Non e
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Transfer Syntaxes for Image Storage Services	SCP	Non e
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Transfer Syntaxes for Image Storage Services	SCP	Non e
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Transfer Syntaxes for Image Storage Services	SCP	Non e
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Transfer Syntaxes for Non-Image Storage Services	SCP	Non e
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Transfer Syntaxes for Non-Image Storage Services	SCP	Non e
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Transfer Syntaxes for Non-Image Storage Services	SCP	Non e
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Transfer Syntaxes for Non-Image Storage Services	SCP	Non e
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Transfer Syntaxes for Non-Image Storage Services	SCP	Non e
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Transfer Syntaxes for Non-Image Storage Services	SCP	Non e
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Transfer Syntaxes for Image Storage Services	SCP	Non e
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Transfer Syntaxes for Image Storage Services	SCP	Non e

Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Transfer Syntaxes for Image Storage Services	SCP	None
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Transfer Syntaxes for Image Storage Services	SCP	None
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Transfer Syntaxes for Image Storage Services	SCP	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Transfer Syntaxes for Image Storage Services	SCP	None
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Transfer Syntaxes for Image Storage Services	SCP	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Transfer Syntaxes for Image Storage Services	SCP	None
VL Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Transfer Syntaxes for Image Storage Services	SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Transfer Syntaxes for Image Storage Services	SCP	None
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Transfer Syntaxes for Image Storage Services	SCP	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Transfer Syntaxes for Image Storage Services	SCP	None
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Transfer Syntaxes for Image Storage Services	SCP	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Transfer Syntaxes for Image Storage Services	SCP	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Transfer Syntaxes for Image Storage Services	SCP	None
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Transfer Syntaxes for Image Storage Services	SCP	None
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Transfer Syntaxes for Image Storage Services	SCP	None

Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Transfer Syntaxes for Image Storage Services	SCP	None
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Transfer Syntaxes for Non-Image Storage Services	SCP	None
VL Multi-frame Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Transfer Syntaxes for Image Storage Services	SCP	None
Standalone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	Transfer Syntaxes for Non-Image Storage Services	SCP	None
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9	Transfer Syntaxes for Non-Image Storage Services	SCP	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Transfer Syntaxes for Non-Image Storage Services	SCP	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Ambulatory ECG Waveform	1.2.840.10008.5.	Transfer Syntaxes for	SCP	None

Storage	1.4.1.1.9.1.3	Non-Image Storage Services		e
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Transfer Syntaxes for Non-Image Storage Services	SCP	None
Hanging Protocol Storage	1.2.840.10008.5.1.4.38.1	Transfer Syntaxes for Non-Image Storage Services	SCP	None

*Table 6. Accepted Transfer Syntaxes for Image Storage Services*

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99
Explicit VR Big Endian	1.2.840.10008.1.2.2
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
JPEG-LS Lossless Image Compression	1.2.840.10008.1.2.4.80
JPEG-LS Lossy (Near-Lossless) Image Compression	1.2.840.10008.1.2.4.81
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91
MPEG2 Main Profile @ Main Level	1.2.840.10008.1.2.4.100
MPEG-4 AVC/H.264 High Profile / Level 4.1	1.2.840.10008.1.2.4.102
MPEG-4 AVC/H.264 BD-compatible High Profile / Level 4.1	1.2.840.10008.1.2.4.103
RLE Lossless	1.2.840.10008.1.2.5

If the Called AET is not corresponding to the actual Storage Server AET, it only will be accepted the Presentation Context for the Verification SOP Class.

### 4.2.1.3. SOP Specific Conformance

#### 4.2.1.3.1. Specific Conformance for Verification SOP Class

SurgeryWorkstation Storage Server provides standard conformance to the DICOM Verification Service Class as a SCP. The status code for the C-ECHO is described in the following table:

*Table 7. SurgeryWorkstation Storage Server C-ECHO Response Status Handling Behavior*

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The C-ECHO request is accepted

#### 4.2.1.3.2. Specific Conformance for Storage SOP Classes

The associated Activity with the Storage service is the storage of medical DICOM data received over the network on a designated storage repository. The SurgeryWorkstation Storage Server AE will return a failure status if it is unable to store the received instance(s).

##### 4.2.1.3.2.1. C-STORE Response Status

*Table 8. SurgeryWorkstation Storage Server C-STORE Response Status*

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The Composite SOP Instance was successfully received, verified, and stored in the system repository.
Error	Processing Failure	0110	This status is returned due to internal errors such as a processing failure response from a filesystem operation. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the console.

### 4.2.2. Storage Client Application Entity Specification

#### 4.2.2.1. SOP Classes

SurgeryWorkstation Storage Client Application Entity provides Standard Conformance to the following SOP Classes:

*Table 9. SOP Classes for SurgeryWorkstation Storage Client AE*

SOP Class Name	SOP Class UID	SCU	SCP
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Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	No	Yes
Basic Study Content Notification SOP Class (Retired)	1.2.840.10008.1.9	Yes	No
Stored Print Storage SOP Class (Retired)	1.2.840.10008.5.1.1.27	Yes	No
Hardcopy Grayscale Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.29	Yes	No
Hardcopy Color Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.30	Yes	No
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	No
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	No
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	No
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	No
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	No
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Yes	No
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	No
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.10.4.1	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.10.4.1	Yes	No
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.10.4.2	Yes	No
Standalone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	Yes	No
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	No
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Yes	No
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	Yes	No
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	No

X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	No
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.12.8	Yes	No
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.9	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	No
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	No
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	No
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	No
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Yes	No
RT Image Storage	1.2.840.10008.5.1.4.1.1.48.1.1	Yes	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.48.1.2	Yes	No
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.48.1.3	Yes	No
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.48.1.4	Yes	No
RT Plan Storage	1.2.840.10008.5.1.4.1.1.48.1.5	Yes	No
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.48.1.6	Yes	No
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.48.1.7	Yes	No
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Yes	No
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	No
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	No
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	No
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Yes	No

Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Yes	No
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	No
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Yes	No
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
VL Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Yes	No
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	No
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Yes	No
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	No
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Yes	No
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	No
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	No
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Yes	No
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Yes	No
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Yes	No
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Yes	No
VL Multi-frame Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Yes	No
Standalone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	Yes	No
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Yes	No
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Yes	No
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Yes	No



Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Yes	No
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	Yes	No
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	Yes	No
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	Yes	No
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	Yes	No
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9	Yes	No
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	No
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	No
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	No
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	No
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Yes	No
Hanging Protocol Storage	1.2.840.10008.5.1.4.38.1	Yes	No
Siemens CSA Non-Image Storage	1.3.12.2.1107.5.9.1	Yes	No

#### **4.2.2.2. Association Establishment Policy**

##### **4.2.2.2.1. General**

The SurgeryWorkstation Storage Client AE can accept Association Requests for the Storage Commitment Push Model Service. It might propose Association Requests for the Storage Service.

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

*Table 10. DICOM application context name for SurgeryWorkstation Storage Client AE*

Application Context Name	1.2.840.10008.3.1.1.1
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#### 4.2.2.2.2. Implementation Identifying Information

The implementation information for this Application Entity is:

*Table 11. DICOM Implementation Class and Version for SurgeryWorkstation Storage Client AE*

Implementation Class UID	1.2.40.0.13.1.1
Implementation Version Name	dcm4che-2.0

#### 4.2.2.2.3. Proposed Presentation Contexts

*Table 12. Proposed Presentation Contexts for SurgeryWorkstation Storage Client AE*

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Transfer Syntaxes for Non-Image Storage Services		SCP	None
Basic Study Content Notification SOP Class (Retired)	1.2.840.10008.1.9	Transfer Syntaxes for Image Storage Services		SCU	None
Stored Print Storage SOP Class (Retired)	1.2.840.10008.5.1.1.27	Transfer Syntaxes for Image Storage Services		SCU	None
Hardcopy Grayscale Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.29	Transfer Syntaxes for Image Storage Services		SCU	None
Hardcopy Color Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.30	Transfer Syntaxes for Image Storage Services		SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Transfer Syntaxes for Image Storage Services		SCU	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Transfer Syntaxes for Image Storage Services		SCU	None
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Transfer Syntaxes for Image Storage Services		SCU	None
Digital Intra-oral X-Ray Image	1.2.840.10008.5.	Transfer Syntaxes for		SCU	Non

Storage - For Processing	1.4.1.1.1.3.1	Image Storage Services		e
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Standalone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Transfer Syntaxes for Image Storage Services	SCU	Non e
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Transfer Syntaxes for Image Storage Services	SCU	Non e
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Transfer Syntaxes for Image Storage Services	SCU	Non e
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Transfer Syntaxes for Image Storage Services	SCU	Non e
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Transfer Syntaxes for Image Storage Services	SCU	Non e
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Transfer Syntaxes for Image Storage Services	SCU	Non e
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Transfer Syntaxes for Image Storage Services	SCU	Non e
Enhanced CT Image Storage	1.2.840.10008.5.	Transfer Syntaxes for	SCU	Non

	1.4.1.1.2.1	Image Storage Services		e
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Transfer Syntaxes for Image Storage Services	SCU	Non e
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Transfer Syntaxes for Image Storage Services	SCU	Non e
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Transfer Syntaxes for Image Storage Services	SCU	Non e
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Transfer Syntaxes for Image Storage Services	SCU	Non e
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Transfer Syntaxes for Image Storage Services	SCU	Non e
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Transfer Syntaxes for Image Storage Services	SCU	Non e
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Transfer Syntaxes for Image Storage Services	SCU	Non e
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Transfer Syntaxes for Image Storage Services	SCU	Non e
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Transfer Syntaxes for Image Storage Services	SCU	Non e
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Transfer Syntaxes for Image Storage Services	SCU	Non e
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e

Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Transfer Syntaxes for Image Storage Services	SCU	None
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Transfer Syntaxes for Image Storage Services	SCU	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Transfer Syntaxes for Image Storage Services	SCU	None
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Transfer Syntaxes for Image Storage Services	SCU	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Transfer Syntaxes for Image Storage Services	SCU	None
VL Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Transfer Syntaxes for Image Storage Services	SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Transfer Syntaxes for Image Storage Services	SCU	None
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Transfer Syntaxes for Image Storage Services	SCU	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Transfer Syntaxes for Image Storage Services	SCU	None
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Transfer Syntaxes for Image Storage Services	SCU	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Transfer Syntaxes for Image Storage Services	SCU	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Transfer Syntaxes for Image Storage Services	SCU	None
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Transfer Syntaxes for Image Storage Services	SCU	None
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Transfer Syntaxes for Image Storage Services	SCU	None
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Transfer Syntaxes for Image Storage Services	SCU	None
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Transfer Syntaxes for Non-Image Storage Services	SCU	None

VL Multi-frame Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Transfer Syntaxes for Image Storage Services	SCU	None
Standalone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	Transfer Syntaxes for Non-Image Storage Services	SCU	None
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9	Transfer Syntaxes for Non-Image Storage Services	SCU	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Transfer Syntaxes for Non-Image Storage Services	SCU	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Transfer Syntaxes for Non-Image Storage Services	SCU	None
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Transfer Syntaxes for Non-Image Storage Services	SCU	None

Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5. 1.4.1.1.9.3.1	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Basic Voice Audio Waveform Storage	1.2.840.10008.5. 1.4.1.1.9.4.1	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e
Hanging Protocol Storage	1.2.840.10008.5. 1.4.38.1	Transfer Syntaxes for Non-Image Storage Services	SCU	Non e

*Table 13. Proposed Transfer Syntaxes for Image Storage Services*

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99
Explicit VR Big Endian	1.2.840.10008.1.2.2
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
JPEG-LS Lossless Image Compression	1.2.840.10008.1.2.4.80
JPEG-LS Lossy (Near-Lossless) Image Compression	1.2.840.10008.1.2.4.81
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91
MPEG2 Main Profile @ Main Level	1.2.840.10008.1.2.4.100
MPEG-4 AVC/H.264 High Profile / Level 4.1	1.2.840.10008.1.2.4.102
MPEG-4 AVC/H.264 BD-compatible High Profile / Level 4.1	1.2.840.10008.1.2.4.103
RLE Lossless	1.2.840.10008.1.2.5

### **4.2.2.3. SOP Specific Conformance**

#### **4.2.2.3.1. Specific Conformance for Storage SOP Classes**

The associated Activity with the Storage client is the storage of medical DICOM data specified by the operator over the network by the SCP. The SurgeryWorkstation Storage Client AE will indicate a failure if it is unable to send the specified instance(s). It always

attempts to send all remaining instances despite a failure with a particular one. After all instances have been processed, the Storage client indicates the total number and size of the instances successfully sent.

#### 4.2.2.3.1.1. C-STORE Response Interpretation

Table 14. SurgeryWorkstation Storage Client C-STORE Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The Composite SOP Instance was successfully received and stored in the system repository by the SCP. Proceed to next step.
Warning	Data Element Coercion	B000	The SCP has corrected some Data Element(s) to avoid a conflict. Warning indication message is output to the console. Assume that the Instance has been stored successfully and proceed to next step.
	Elements Discarded	B006	Some Data Element(s) were discarded by the SCP. Warning indication message is output to the console. Assume that the Instance has been stored successfully and proceed to next step.
	Data Set does not match SOP Class	B007	Assume that the SCP has stored the Instance anyway. Warning indication message is output to the console. Proceed to next step.
Error	Others	Others	Any unrecognized Error Code is considered an indication that the Instance wasn't stored. Error indication message is output to the console. Do not include the Instance in the number of transferred Instances and their summary size but still proceed to the next step.

#### 4.2.3. Modality Worklist Client Application Entity Specification

##### 4.2.3.1. SOP Classes

Table 15. SOP Classes for SurgeryWorkstation Modality Worklist Client AE

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

##### 4.2.3.2. Association Establishment Policy



#### 4.2.3.2.1. General

At a command from the operator, the SurgeryWorkstation Modality Worklist Client AE attempts to establish an association with the specified Remote AE. When the association is established, a C-FIND request is made to retrieve a worklist using the defined matching and return keys. The Modality Worklist Client waits for any C-FIND response. The established association remains active until a C-FIND response from the remote AE indicates the end of worklist items, or until a configurable timeout period expires.

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

*Table 16. DICOM application context name for SurgeryWorkstation Modality Worklist Client AE*

Application Context Name	1.2.840.10008.3.1.1.1
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#### 4.2.3.2.2. Implementation Identifying Information

The implementation information for this Application Entity is:

*Table 17. DICOM Implementation Class and Version for SurgeryWorkstation Modality Worklist Client AE*

Implementation Class UID	1.2.40.0.13.1.1
Implementation Version Name	dcm4che-2.0

#### 4.2.3.2.3. Association Initiation Policy

An Association is attempted with the specified Remote AE when the operator starts the Client.

#### 4.2.3.2.4. Association Acceptance Policy

The Modality Worklist Client AE does not accept Associations.

#### 4.2.3.2.5. Proposed Presentation Contexts

*Table 18. Proposed Presentation Contexts for SurgeryWorkstation Modality Worklist Client AE*

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Worklist Information Model –	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

FIND		Explicit VR Little Endian	1.2.840.10008.1.2.1		
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Both Transfer Syntaxes are proposed by default. The operator can request that only the Implicit VR LE is proposed (option `-ivrle`).

### 4.2.3.3. SOP Specific Conformance

#### 4.2.3.3.1. Specific Conformance for Modality Worklist SOP Class

All attributes listed below are requested in each query. The corresponding matching keys are empty if the operator didn't specify a particular value.

*Table 19. Modality Worklist C-FIND SCU Supported Elements*

Attribute Name	Tag	VR
Accession Number	0008,0050	SH
Referring Physician's Name	0008,0090	PN
Patient's Name	0010,0010	PN
Patient ID	0010,0020	LO
Patient's Birth Date	0010,0030	DA
Patient's Sex	0010,0040	CS
Patient's Weight	0010,1030	DS
Medical Alerts	0010,2000	LO
Allergies	0010,2110	LO
Pregnancy Status	0010,21C0	US
Study Instance UID	0020,000D	UI
Requesting Physician	0032,1032	PN
Requesting Service	0032,1033	LO
Requested Procedure Description	0032,1060	LO
Admission ID	0038,0010	LO
Special Needs	0038,0050	LO
Current Patient Location	0038,0300	LO
Patient State	0038,0500	LO
Modality	0008,0060	CS
Requested Contrast Agent	0032,1070	LO
Scheduled Station AE Title	0040,0001	AE
Scheduled Procedure Step Start Date	0040,0002	DA
Scheduled Procedure Step Start Time	0040,0003	TM

Scheduled Performing Physician's Name	0040,0006	PN
Scheduled Procedure Step Description	0040,0007	LO
Scheduled Procedure Step ID	0040,0009	SH
Scheduled Station Name	0040,0010	SH
Scheduled Procedure Step Location	0040,0011	SH
Pre-Medication	0040,0012	LO
Scheduled Procedure Step Status	0040,0020	CS
Requested Procedure ID	0040,1001	SH
Requested Procedure Priority	0040,1003	SH
Patient Transport Arrangements	0040,1004	LO
Placer Order Number / Imaging Service Request	0040,2016	LO
Filler Order Number / Imaging Service Request	0040,2017	LO
Confidentiality Constraint on Patient Data Description	0040,3001	LO

#### 4.2.3.3.1.1. C-STORE Response Interpretation

Table 20. SurgeryWorkstation Toolkit Modality Worklist Client C-STORE Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	This is the last response and the Client will release the Association after printing results to the console.
Pending	Matching is continuing	FF00	The Client waits for another response.

#### 4.2.3.3.1.2. Communication Failure Reasons

Table 21. dSurgeryWorkstation Modality Storage Client Communication Failure Behavior

Exception	Behavior
Association aborted by the SCP or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Error message is output to the console.

### 4.3. Physical Network Interfaces

#### 4.3.1. Supported Communication Stacks

DICOM Upper Layer over TCP/IP is supported.

#### 4.3.1.1. TCP/IP Stack

The SurgeryWorkstation inherits its TCP/IP stack from the installed Java Runtime Environment.

#### 4.3.2. Physical Network Interface

SurgeryWorkstation is indifferent to the physical medium over which TCP/IP executes; it inherits this from the Java Runtime Environment.

### 5. Configuration

Please refer to the online help that can be obtained by starting the Applications without any command line options.

#### 5.1. AE Title/Presentation Address Mapping

##### 5.1.1. Local AE Titles

The local AE Titles and TCP ports are configurable through command line options.

*Table 22. AE Title Configuration Table*

Application Entity	Default AE Title	Default TCP/IP Port
SurgeryWorkstation Storage Server	SWRCV	— (note 1)
SurgeryWorkstation Storage Client	SWSND	— (note 2)
SurgeryWorkstation Modality Worklist Client	SWMWL	— (note 3)

Note 1: The Storage Server AE requires at least the TCP port specified and will not start otherwise. The actual value is operator-dependent. If the AE title is changed through the option `-device`, any Called AE Title is accepted during an Association; an unnamed option, though, will require exact match of the Title.

Note 2: A client chooses any free port by default. The option `-device` changes only the Title. The option `-L` also allows to bind to a particular local port.

Note 3: Any free port is chosen. The option `-device` allows to change the AE Title.

##### 5.1.2. Remote AE Title

Association Requests with any Calling AET will be accepted.

The remote AE Titles and TCP ports are configurable by command line options.

## 5.2. Parameters

SurgeryWorkstation configuration parameters relevant to DICOM communication.

Table 23. Configuration Parameter Table

Parameter	Configurable (Yes/No)	Default Value
<i>General Parameters</i>		
Listening Port	Yes	operator's choice
Time-out waiting for A-ASSOCIATE RQ on open TCP/IP connection (ARTIM timeout)	Yes	5s
Time-out waiting on an open association for the next message (DIMSE timeout)	Yes	60s
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	no timeout
Time-out waiting on an open association for the next message after sending A-RELEASE RSP or A-ABORT RQ (Closing timeout)	No	500ms
Maximum PDU size the AE can receive	Yes	16352
Maximum PDU size the AE can send	Yes	16352
Pack Command and Data PDVs in one PDU	Yes	false
Support for the Basic TLS Secure Transport Connection Profile	Yes	Off
Accepted TLS Ciphers	Yes	-
<i>Storage Server AE</i>		
Accepted Called AETs	Yes	SWRCV
Accepted Calling AETs	Yes	any
List of DICOM AETs that identify the location from which composite object instance(s) received by this Storage Server may be retrieved on the network	No	unsupported
Storage Directory Path Prefix	Yes	operator's choice
Time-out waiting for the A-ASSOCIATE-AC PDU after transmission of the A-ASSOCIATE-RQ to open an association to the Storage Commitment SCU	Yes	5s
<i>Storage Client AE</i>		
Proposed Calling AET	Yes	SWSND
Proposed Called AETs	Yes	any
<i>Modality Worklist Client AE</i>		
Proposed Calling AET	Yes	SWMWL

Proposed Called AETs	Yes	any
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## 6. Media Interchange

SurgeryWorkstation does not support Media Storage.

## 7. Support of Extended Character Sets

SurgeryWorkstation supports ISO\_IR 100 (ISO 8859-1 Latin 1) as an extended character set.