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PrintSCP DICOM Print Server

DICOM Conformance Statement

Version 1.0

Intended Audience

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

Revision History

Revision	Comments	Date
1.0	Initial Version	February 2009

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1. Introduction

1.1 Overview

PrintSCP implements the necessary DICOM services to receive DICOM print jobs and provides an interface for printing the received data on any Windows™ printer.

1.2 Scope

This document is the PrintSCP Print Server conformance to the DICOM 3.0 Standard. This statement is intended for evaluating the integration and connection of PrintSCP with other DICOM compliant devices.

1.3 References

DICOM 3.0 Standard, Parts 1 through 14 (PS 3.1-PS3.14); 2008
PrintSCP Administration Manual.

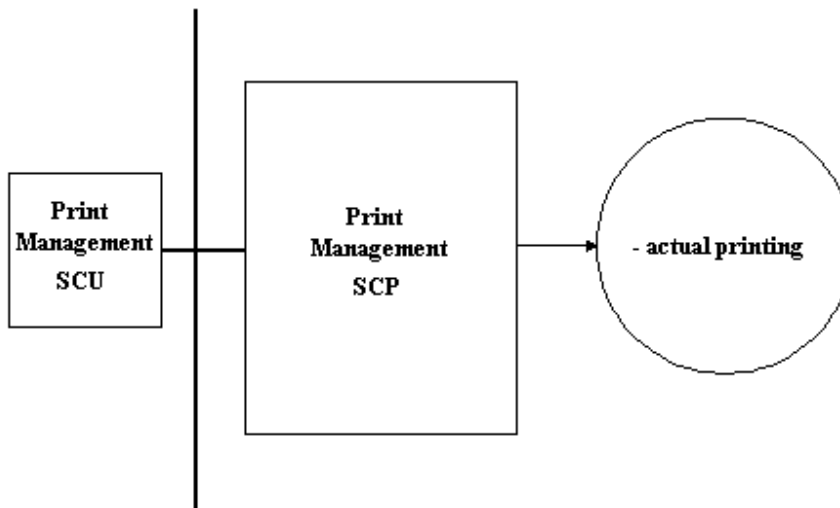
1.4 Definitions

AE Application Entity
AE-Title name of an AE
DICOM Digital Imaging and Communications in Medicine
IE Information Entity
IHE Integrating the Healthcare Enterprise
IOD Information Object Definition
PDU Protocol Data Unit
SCP Service Class Provider
SCU Service Class User
SOP Service Object Pair
TCP/IP Transmission Control Protocol / Internet Protocol
UID Unique Identifier
VM Value Multiplicity
VR Value Representation

2.0 Implementation Model

PrintSCP Print Server supports multiple Application Entities. Many DICOM Print SCUs may concurrently initiate or maintain associations with PrintSCP.

2.1 Application Data Flow Diagram



2.2 Functional Definition of Application Entities

The Print Server waits for other Print SCU applications to connect at a specific TCP/IP port number. PrintSCP will accept associations with Presentation Context for the Print Management Service class.

2.3 Sequencing of Real-World Activities

A Film Session has to be created before one or more Film Boxes can be created. In turn the Film Box has to be created before one or more Image Boxes can be set.

3.0 AE Specifications

PrintSCP Print Server supports only one Application Entity or AE.

3.1 AE Print Server – Specification

The Print Server provides Standard Conformance to the following DICOM 3.0:

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18

3.1.1 Association Establishment Policies

3.1.1.1 General

The maximum PDU size which can be transmitted by the Print Server is fixed at 16KB. The default maximum PDU size which can be received by the Print Server is configurable with a default value of 16KB and a maximum value of 32KB.

3.1.1.2 Number of Associations

PrintSCP can accept till 10 simultaneous associations. The Print Server will spawn a new process for each association request that it receives.

3.1.1.3 Asynchronous Nature

The Print Server does not support asynchronous operations and will not perform asynchronous window negotiation.

3.1.1.4 Implementation Identifying Information

The Print Server will provide an implementation class UID which is 1.2.826.0.1.3680043.2.1396.999.10

The Print Server will provide an Implementation version name of PrintSCP V1.0.

3.1.2 Association Initiation Policy

The Print Server does not initiate any associations.

3.1.3 Association Acceptance Policy

PrintSCP will accept any association regardless the called AE Title matches or not the PrintSCP AE Title. Also it is not requested that the calling AE Title be known by PrintSCP.

3.1.3.1 Presentation Context Table

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Verification	1.2.840.10008.1.1	1.2.840.10008.1.2	SCP	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.9	1.2.840.10008.1.2	SCP	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.18	1.2.840.10008.1.2	SCP	None
Basic Film Session SOP Class	1.2.840.10008.5.1.1	1.2.840.10008.1.2	SCP	None
Basic Film Box SOP Class	1.2.840.10008.5.1.2	1.2.840.10008.1.2	SCP	None
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.4	1.2.840.10008.1.2	SCP	None
Basic Color Image Box SOP Class	1.2.840.10008.5.1.4.1	1.2.840.10008.1.2	SCP	None
Printer SOP Class	1.2.840.10008.5.1.16	1.2.840.10008.1.2	SCP	None

3.1.3.2 SOP Specific Conformance for Basic Film Session SOP Class

The following DIMSE services are supported:

N-CREATE
N-ACTION
N-DELETE

3.1.3.2.1 N-CREATE

Tag	Name	Value
(2000, 0010)	Number of Copies	Ignored
(2000, 0030)	Medium Type	Ignored
(2000, 0040)	Film Destination	Ignored

3.1.3.2.2 N-ACTION

The SCP will return one of the following status codes for N-ACTION:

Code	Status	Comment
0x0000	Success	Film Session was successfully printed
0x0112	Failure	Not such SOP instance
0x0213	Failure	Resource Limitation

3.1.3.2.3 N-DELETE

The SCP will return one of the following status codes for N-DELETE:

Code	Status	Comment
0x0000	Success	Film Session was successfully deleted
0x0112	Failure	Not such SOP instance

3.1.3.3 SOP Specific Conformance for Basic Film Box SOP Class

The following DIMSE services are supported:

N-CREATE
N-DELETE
N-ACTION

3.1.3.3.1 N-CREATE

Tag	Name	Value
(2010, 0010)	Image Display Format	STANDARD\1,1 STANDARD\1,2 STANDARD\2,1 STANDARD\2,2

		STANDARD\2,3 STANDARD\2,4 STANDARD\3,2 STANDARD\3,3 STANDARD\3,4 STANDARD\3,5 STANDARD\4,3 STANDARD\4,4 STANDARD\4,5 STANDARD\4,6 STANDARD\5,3 STANDARD\5,4 STANDARD\5,5 STANDARD\5,6 STANDARD\5,7
(2010, 0040)	Film Orientation	PORTRAIT LANDSCAPE
(2010, 0050)	Film Size ID	14INX17IN 14INX14IN 11INX17IN 8INX10IN 8,5INX11IN 24CMX24CM 24CMX30CM A4 A3
(2010, 0060)	Magnification Type	BILINEAR
(2010, 0100)	Border Density	BLACK WHITE
(2010, 0110)	Empty Image Density	BLACK WHITE
(2010, 0120)	Min Density	Ignored
(2010, 0130)	Max Density	Ignored

3.1.3.3.2 N-ACTION

The SCP will return one of the following status codes for N-ACTION:

Code	Status	Comment
0x0000	Success	Film Box was successfully printed
0x0112	Failure	Not such SOP instance
0x0213	Failure	Resource Limitation

3.1.3.3.3 N-DELETE

The SCP will return one of the following status codes for N-DELETE:

Code	Status	Comment
0x0000	Success	Film Box was successfully deleted

0x0112	Failure	Not such SOP instance
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3.1.3.4 SOP Specific Conformance for Basic Grayscale Image Box SOP Class

The following DIMSE services are supported:

N-SET

Tag	Name	Value
(2020,0010)	Image Position	
(2020,0020)	Polarity	NORMAL or ignored
(2010,0060)	Magnification Type	Ignored. Always BILINEAR
(2010,0080)	Smoothing Type	Ignored
(2020,0110)	Basic Grayscale Image Sequence	
(0028,0002)	>Samples Per Pixel	1
(0028,0004)	>Photometric Interpretation	MONOCHROME1 MONOCHROME2
(0028,0010)	>Rows	
(0028,0011)	>Columns	
(0028,0100)	>Bits Allocated	8
(0028,0101)	>Bits Stored	8
(0028,0102)	>High Bit	7
(0028,0103)	>Pixel Representation	
(0028,0034)	>Pixel Aspect Ratio	
(7FE0,0010)	>Pixel Data Mandatory	

The SCP will return one of the following status codes for N-SET:

Code	Status	Comment
0x0000	Success	Image Box was successfully set
0x0110	Failure	Processing failure

3.1.3.5 SOP Specific Conformance for Basic Color Image Box SOP Class

The following DIMSE services are supported:

N-SET

Tag	Name	Value
(2020,0010)	Image Position	
(2020,0020)	Polarity	NORMAL or ignored
(2010,0060)	Magnification Type	Ignored. Always BILINEAR
(2010,0080)	Smoothing Type	Ignored
(2020,0110)	Basic Grayscale Image Sequence	

(0028,0002)	>Samples Per Pixel	1
(0028,0004)	>Photometric Interpretation	RGB
(0028,0006)	>Planar Configuration	0 or 1
(0028,0010)	>Rows	
(0028,0011)	>Columns	
(0028,0100)	>Bits Allocated	8
(0028,0101)	>Bits Stored	8
(0028,0102)	>High Bit	7
(0028,0103)	>Pixel Representation	
(0028,0034)	>Pixel Aspect Ratio	
(7FE0,0010)	>Pixel Data Mandatory	

The SCP will return one of the following status codes for N-SET:

Code	Status	Comment
0x0000	Success	Image Box was successfully set
0x0110	Failure	Processing failure

4 Communication Profiles

4.1 TCP/IP Stack

The Print Server provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.1.1 TCP/IP API

The Print Server uses the TCP/IP stack from the Windows system upon which it executes. It uses a subroutine library that is based on a Berkeley socket interface.

4.1.2 Physical Media Support

The Print Server exists as a software application on a Windows operating system. As such, it places no restrictions on the physical network. The Print Server uses TCP/IP over Ethernet.

5 Extensions/Specializations/Privatizations

Not applicable