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SHOWCASE® Viewing Software
DICOM Conformance Statement

Revision 6.0, February, 2023

ShowCase Software versions 6.5.0 and higher

Revision History

Revision	Date	Author	Reason for Change
1.0	01/11/04	DRH	Initial version for marketed release of Network ShowCase.
1.1	02/11/04	SBS	Update after outside verification.
2.0	11/28/06	SBS	Update for 4.9.3 software – added support for saving annotated 8 palette color. No longer convert to RGB on save.
2.1	07/03/07	DRH	Added table of elements deleted during de-identification process.
3.0	04/15/08	SBS	Revision 3.0 for ShowCase release 5.0 – add Structured Report support. Change name from Network ShowCase to ShowCase Connect.
4.0	04/22/10	SBS	Corrections – JPEG Lossless supported for all ultrasound images
5.0	04/22/17	PJM	Update for Raw Data objects.
6.0	2/13/23	PJM	Update for Workstation / removal of Connect.

1   Introduction

1.1   Purpose of this Document

This document is the DICOM Conformance Statement for the ShowCase medical image viewing software developed by Trillium Technology, Inc, Ann Arbor, Michigan, USA. ShowCase software, versions Basic and Premier, running on a personal computer or laptop, provides the ability to review DICOM images and if desired, de-identify them and prepare them for export into PowerPoint presentations or teaching files. ShowCase also displays measurements and data transferred in DICOM Structured Reports (display only, no modifications).

The Workstation version of ShowCase can query DICOM nodes for images and structured reports. It can store images and structured report objects sent to it by DICOM image acquisition devices as DICOM files. It can send images to DICOM nodes (CSTORE). All versions of ShowCase read images and structured reports from DICOM exchange media.

Part 2 of this conformance statement contains a detailed description of the **network** interactions between ShowCase and other imaging devices that conform to the DICOM 3.0 standard. ShowCase implements DICOM messaging using the Trillium Dicom Library.

Part 3 of this conformance statement includes a description of ShowCase support for DICOM **exchange media**. All installed versions of ShowCase (version that do not run from CDs/DVDs) read and write DICOM exchange media such as CDs, DVDs, and MO disks and USB 'thumb drives'.

1.2   References and Definitions

Digital Imaging and Communications in Medicine (DICOM) standard, parts 1 through 17 (NEMA PS 3.1-3.17).

1.3   Acronyms and Abbreviations

Symbols and abbreviations used in this conformance statement are defined in Digital Imaging and Communications in Medicine (DICOM) standard, parts 1 through 17 (NEMA PS 3.1- 3.17).

2   Network Conformance Statement

2.1   Introduction

This section describes the DICOM network interactions of the ShowCase software running on a computer.

2.2   Implementation Model

The ShowCase network interactions are described in this section divided into two separate roles: 1- as a Query/Retrieve and Store SCU and 2- as an image and Structured Report Store SCP.

2.2.1   Application Data Flow Diagram

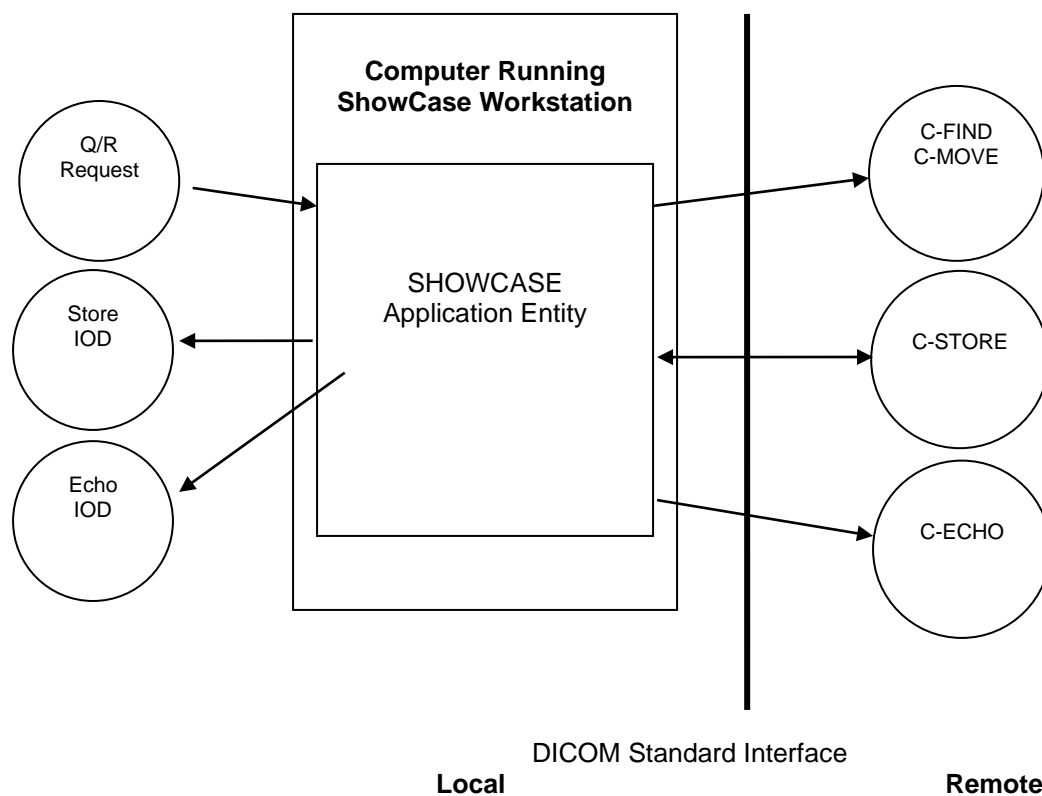The following diagram shows the implementation model of ShowCase.

Figure 2.2-1 ShowCase Implementation Model

2.2.2   Functional Definition of Application Entity

All communications with remote DICOM applications is accomplished using the DICOM protocol over a network using the TCP/IP protocol stack.

ShowCase supports the following functions.

SCU	SCP
Echo	Echo
Query/Retrieve	
Storage	Storage

Showcase:
- Responds to or initiates a DICOM Echo
- Accepts a DICOM association to store images
- Initiates a DICOM association in order to query a remote AE and request a C-FIND and C-MOVE.
- Initiates a DICOM association to store to a remote AE using C-STORE.

2.2.3   Sequencing of Real World Activities

Typically, a user might query a networked DICOM server (Query SCU) for an image series, retrieve the series to the local machine (Store SCP) and view the images with ShowCase viewing features. The user might then de-identify an image (remove the patient name and other identifiers both in the image and the DICOM header) and save the file to DICOM media (Media FSU) or export the file in a consumer format for use in a PowerPoint presentation.

2.3   Application Entity Specifications

2.3.1   ShowCase Workstation acting as a Query/Retrieve SCU

The ShowCase Workstation Application Entity provides standard conformance to the following DICOM V3.0 SOP Classes as an SCU.

ShowCase Supported SOP Classes for Query / Retrieve		
Function	SOP Class UID	SOP Class Name
Query/Retrieve	1.2.840.10008.5.1.4.1.2.2.1	Study Root Query/Retrieve Model - FIND
Query/Retrieve	1.2.840.10008.5.1.4.1.2.2.2	Study Root Query/Retrieve Model - MOVE

2.3.1.1   Association Establishment Policies

The ShowCase Workstation Application initiates an association with a configured DICOM query node. It does not accept query/retrieve associations.

2.3.1.1.1   General

The DICOM Application Context Name that is proposed by ShowCase is 1.2.840.10008.3.1.1.1. The services offer a maximum PDU size of 64234 bytes upon association initiation. There is no limit on the number of Presentation Context Items that will be proposed.

2.3.1.1.2   Number of Associations

The ShowCase Workstation Application opens one association at a time as a Query/Retrieve SCU.

2.3.1.1.3   Asynchronous Nature

The ShowCase Workstation Application does not support asynchronous query operations.

2.3.1.1.4   Implementation Identifying Information

The Implementation Class UID is: **"1.2.840.113857.5"**.
The Implementation Version String is: "**TriIDCM 1.0.0**".

2.3.1.2   Association Initiation by Real-World Activity

The ShowCase Workstation Application acting in its Query/Retrieve role initiates associations for the following activities:
- Querying a remote DICOM node for available series.
- Retrieval of series from a remote DICOM node.
- Testing that it can establish an association with a remote DICOM node for Query/Retireve.
- Storage to a remote Dicom node.

2.3.1.2.1   Real-World Activity – DICOM Query

2.3.1.2.1.1   Associated Real World Activity - DICOM Query

The user selects a configured worklist tab and then sets the selection criteria to use in the query request. The user interface displays the results of the query by showing one line of description for each series that matches the criteria.

2.3.1.2.1.2   Proposed Presentation Contexts - DICOM Query

The ShowCase Workstation Application proposes the Presentation Contexts shown below.

ShowCase Workstation Proposed Presentation Contexts - Query					
Abstract Syntax Name	**Abstract Syntax UID**	**Transfer Syntax Name**	**Transfer Syntax UID**	**Role**	**Extended Negotiation**
Study Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR, Little Endian; Explicit VR, BE; Explict VR, LE;	1.2.840.10008.1.2	SCU	None

2.3.1.2.1.3   SOP Specific Conformance to Study Root Query Retrieve SOP Class

The ShowCase Workstation Application uses a Study Root C-Find as defined in DICOM 3.0 Part 4 to query for images. All Required(R) and Unique (U) and some Optional (O) Study and Series level keys are used as shown in the following table.

Data Level	Description	Tag	Type
Study	Patient Name	(0010,0010)	R
Study	Patient ID	(0010,0020)	R
Study	Study ID	(0020,0010)	R
Study	Study Instance UID	(0020,000D)	U
Study	Accession Number	(0008,0050)	R
Study	Study Date	(0008,0020)	R
Study	Referring Physician	(0008,0090)	O
Series	Series Modality	(0008,0060)	R
Series	Series Number	(0020,0011)	R
Series	Series Instance UID	(0020,000E)	U

Series	Number of Series Related Instances	(0020,1209)	O

2.3.1.2.2   Real-World Activity – Retrieve Study

2.3.1.2.2.1   Associated Real World Activity - Retrieve Study

The user selects one or more studies that were listed from a Query and retrieves the selected study from the remote DICOM node.

2.3.1.2.2.2   Proposed Presentation Contexts - Retrieve Study

ShowCase Workstation Proposed Presentation Contexts - Retrieve					
Abstract Syntax Name	**Abstract Syntax UID**	**Transfer Syntax Name**	**Transfer Syntax UID**	**Role**	**Extended Negotiation**
Study Root Query Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None

2.3.1.2.2.3   SOP Specific Conformance to Study Root Query Retrieve SOP Class

ShowCase Workstation provides standard conformance for a MOVE at the series level.

2.3.1.2.3   Real-World Activity – Test Query/Retrieve Association

2.3.1.2.3.1   Associated Real World Activity - Test Association

To test the DICOM connectivity on the network, the user interacts with UI provided to check whether a Query/Retrieve association can be established with a selected DICOM node. This tests DICOM messaging and establishes whether the remote node is set up to allow Query/Retrieve from ShowCase Workstation.

2.3.1.2.3.2   Proposed Presentation Contexts - Test Association

ShowCase Workstation Proposed Presentation Contexts – Test Query/Retrieve Node					
Abstract Syntax Name	**Abstract Syntax UID**	**Transfer Syntax Name**	**Transfer Syntax UID**	**Role**	**Extended Negotiation**
Study Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None

2.3.1.2.3.3   SOP Specific Conformance to Study Root Query Retrieve SOP Class

The ShowCase Workstation Application tests that it can successfully establish an association with the remote DICOM node for the purpose of doing a FIND. No actual FIND request is initiated.

2.3.1.3   Association Acceptance Policies

ShowCase Workstation does not accept any associations when acting in its Query/Retrieve SCU role.

2.3.2   ShowCase Workstation acting as a Store SCU

The ShowCase Workstation Application Entity provides standard conformance to the following DICOM V3.0 SOP Classes as an SCU.

ShowCase Workstation Supported SOP Classes for Image Store		
Function	**SOP Class UID**	**SOP Class Name**
Storage	1.2.840.10008.5.1.4.1.1.7	Secondary Capture Image Storage
Storage	1.2.840.10008.5.1.4.1.1.7.1	Multiframe Single Bit Secondary Capture Image Storage
Storage	1.2.840.10008.5.1.4.1.1.7.2	Multiframe Grayscale Byte Secondary Capture Image Storage
Storage	1.2.840.10008.5.1.4.1.1.7.3	Multiframe Grayscale Word Secondary Capture Image Storage
Storage	1.2.840.10008.5.1.4.1.1.7.4	Multiframe True Color Secondary Capture Image Storage
Storage	1.2.840.10008.5.1.4.1.1.6	Ultrasound Image Storage (retired)
Storage	1.2.840.10008.5.1.4.1.1.6.1	Ultrasound Image Storage
Storage	1.2.840.10008.5.1.4.1.1.3.1	Ultrasound Multi-Frame Image Storage
Storage	1.2.840.10008.5.1.4.1.1.20	Nuclear Medicine Image Storage
Storage	1.2.840.10008.5.1.4.1.1.12.1	X-Ray Angiographic Image Storage
Storage	1.2.840.10008.5.1.4.1.1.12.2	X-Ray Radiofluoroscopic Image Storage
Storage	1.2.840.10008.5.1.4.1.1.12.3	X-Ray Angiographic Bi-plane Image Storage (retired)
Storage	1.2.840.10008.5.1.4.1.1.14.1	IVOCT Image Storage - For Presentation
Storage	1.2.840.10008.5.1.4.1.1.14.2	IVOCT Image Storage - For Processing
Storage	1.2.840.10008.5.1.4.1.1.1.1	Digital X-Ray Image Storage - For Presentation
Storage	1.2.840.10008.5.1.4.1.1.1.1.1	Digital X-Ray Image Storage - For Processing
Storage	1.2.840.10008.5.1.4.1.1.1.2	Digital Mammography Image Storage - For Presentation
Storage	1.2.840.10008.5.1.4.1.1.1.2.1	Digital Mammography Image Storage - For Processing
Storage	1.2.840.10008.5.1.4.1.1.1.3	Digital Intra – oral X-Ray Image Storage – for Presentation
Storage	1.2.840.10008.5.1.4.1.1.1.3.1	Digital Intra – oral X-Ray Image Storage – for Processing
Storage	1.2.840.10008.5.1.4.1.1.4	MR Image Storage
Storage	1.2.840.10008.5.1.4.1.1.1	Computed Radiography Image Storage
Storage	1.2.840.10008.5.1.4.1.1.2	CT Image Storage
Storage	1.2.840.10008.5.1.4.1.1.66	Raw Data
Storage	1.2.840.10008.5.1.4.1.1.128	Positron Emission Tomography Image Storage
Storage	1.2.840.10008.5.1.4.1.1.88.11	Basic Text Structured Report
Storage	1.2.840.10008.5.1.4.1.1.88.33	Comprehensive Structured Report
Storage	1.2.840.10008.5.1.4.1.1.88.22	Enhanced Structured Report

2.3.2.1   Association Establishment Policies

The ShowCase Workstation Application initiates an association with a configured DICOM query node. Presentation states are based on the SOP classes it is being asked to store.

2.3.2.1.1   General

The DICOM Application Context Name that is proposed by ShowCase is 1.2.840.10008.3.1.1.1. The services offer a maximum PDU size of 65536 bytes upon association initiation. There is no limit on the number of Presentation Context Items that will be proposed.

2.3.2.1.2   Number of Associations

The ShowCase Workstation Application opens one association at a time as a Storage SCU.

2.3.2.1.3   Asynchronous Nature

The ShowCase Workstation Application does not support asynchronous query operations.

2.3.2.1.4   Implementation Identifying Information

The Implementation Class UID is: **"1.2.840.113857.5"**.
The Implementation Version String is: "**TriIDCM 1.0.0**".

2.3.2.2   Association Initiation by Real-World Activity

The ShowCase Workstation Application acting in its Storage role initiates associations for storage to a remote Dicom node.

2.3.2.2.1   Real-World Activity – DICOM Store

2.3.2.2.1.1   Associated Real World Activity - DICOM Store

The user receives a study on removable media. They view the study and then copy it into a local cache tab for a remote DICOM node. Once in that tab, they press a "Send" button to initiate a DICOM CSTORE of the study to the remote node.

2.3.2.2.1.2   Proposed Presentation Contexts - DICOM Store

The ShowCase Workstation Application proposes the Presentation Contexts based on the presentation contexts of the files that comprise the study it has been asked to send.

2.3.2.3   Association Acceptance Policies

ShowCase Workstation does not accept any associations when acting in its Store SCU role. It will accept associations when acting in its Store SCP role.

2.3.2.4   Corrective Behaviors During Storage

ShowCase Workstation will correct the following issues with outgoing IODs:
- Out of order group/element tags
- Improperly padded strings, e.g. strings padded with 0x00 characters instead of 0x20 characters.

2.3.3   ShowCase Workstation acting as a Storage SCP

The ShowCase Workstation Application provides standard conformance to the following DICOM V3.0 SOP Classes as a Store SCP.

ShowCase Workstation Supported SOP Classes for Image Store		
Function	**SOP Class UID**	**SOP Class Name**
Storage	1.2.840.10008.5.1.4.1.1.7	Secondary Capture Image Storage
Storage	1.2.840.10008.5.1.4.1.1.6.1	Ultrasound Image Storage
Storage	1.2.840.10008.5.1.4.1.1.3.1	Ultrasound Multi-Frame Image Storage
Storage	1.2.840.10008.5.1.4.1.1.20	Nuclear Medicine Image Storage
Storage	1.2.840.10008.5.1.4.1.1.12.1	X-Ray Angiographic Image Storage
Storage	1.2.840.10008.5.1.4.1.1.12.2	X-Ray Radiofluoroscopic Image Storage
Storage	1.2.840.10008.5.1.4.1.1.1.1	Digital X-Ray Image Storage - For Presentation

Storage	1.2.840.10008.5.1.4.1.1.1.1.1	Digital X-Ray Image Storage - For Processing
Storage	1.2.840.10008.5.1.4.1.1.1.2	Digital Mammography Image Storage - For Presentation
Storage	1.2.840.10008.5.1.4.1.1.1.2.1	Digital Mammography Image Storage - For Processing
Storage	1.2.840.10008.5.1.4.1.1.4	MR Image Storage
Storage	1.2.840.10008.5.1.4.1.1.1	Computed Radiography Image Storage
Storage	1.2.840.10008.5.1.4.1.1.2	CT Image Storage
Storage	1.2.840.10008.5.1.4.1.1.66	Raw Data
Storage	1.2.840.10008.5.1.4.1.1.128	Positron Emission Tomography Image Storage
Storage	1.2.840.10008.5.1.4.1.1.88.11	Basic Text Structured Report
Storage	1.2.840.10008.5.1.4.1.1.88.33	Comprehensive Structured Report
Storage	1.2.840.10008.5.1.4.1.1.88.22	Enhanced Structured Report

2.3.3.1   Association Establishment Policies

ShowCase Workstation does not initiate associations when acting as a Store SCP. It accepts associations from any DICOM node for image storage.

2.3.3.2   Association Initiation by Real-World Activity

ShowCase Workstation does not initiate associations in its role as an image Store SCP.

2.3.3.3   Association Acceptance Policies

ShowCase Workstation accepts associations from any DICOM node for storing images.

2.3.3.3.1   Image Storage

2.3.3.3.1.1   Associated Real World Activity

ShowCase Workstation accepts images from remote DICOM nodes and stores the IODs.

2.3.3.3.1.2   Accepted Presentation Context

<table>
<tr><td colspan="5">ShowCase Workstation Proposed Presentation Contexts – Image Store</td></tr>
<tr><th>SOP Class Name</th><th>SOP Class UID</th><th>Role</th><th>Extended Negotiation</th><th>Transfer Syntax</th></tr>
<tr><td>Ultrasound Image Storage</td><td>1.2.840.10008.5.1.4.1.1.6.1</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>Ultrasound Multi-Frame Image Storage</td><td>1.2.840.10008.5.1.4.1.1.3.1</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>MR Image Storage</td><td>1.2.840.10008.5.1.4.1.1.4</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>Computed Radiography Image Storage</td><td>1.2.840.10008.5.1.4.1.1.1</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>CT Image Storage</td><td>1.2.840.10008.5.1.4.1.1.2</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>Secondary Capture Image Storage</td><td>1.2.840.10008.5.1.4.1.1.7</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>Nuclear Medicine Image Storage</td><td>1.2.840.10008.5.1.4.1.1.20</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>X-Ray Angiographic Image Storage</td><td>1.2.840.10008.5.1.4.1.1.12.1</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>X-Ray Angiographic Bi-Plane Image Storage</td><td>1.2.840.10008.5.1.4.1.1.12.3</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>X-Ray Radiofluoroscopic Image Storage</td><td>1.2.840.10008.5.1.4.1.1.12.2</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>RT Image Storage</td><td>1.2.840.10008.5.1.4.1.1.481.1</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
<tr><td>Positron Emission Tomography Image Storage</td><td>1.2.840.10008.5.1.4.1.1.128</td><td>SCP</td><td>None</td><td>See Storage List Below</td></tr>
</table>

Storage Transfer Syntaxes Supported

Transfer Syntax	Transfer Syntax UID
RLE Lossless	1.2.840.10008.1.2.5
JPEG Lossless, NH,FOP (Process 14)	1.2.840.10008.1.2.4.70
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
Implicit Little Endian	1.2.840.10008.1.2
Explicit Big Endian	1.2.840.10008.1.2.2
Explicit Little Endian	1.2.840.10008.1.2.1

2.3.3.3.1.3   SOP Specific Conformance Storage SOP Classes

Images: ShowCase Workstation provides standard conformance for a STORE for image SOPs. It maintains all private elements transferred with the image IODs.

Structured Reports: Structured Report viewing is supported only for "Vascular ultrasound procedure Reports" and "Echocardiography Procedure Reports" templates (5100 and 5200) and Basic Text Structured Reports as defined by DICOM Standard Parts 3 and 16.

2.3.3.4   Corrective Behaviors During Storage

ShowCase Workstation will correct the following issues with incoming IODs:
- Out of order group/element tags
- Improperly padded strings, e.g. strings padded with 0x00 characters instead of 0x20 characters.

2.4   Communication Profiles

2.4.1   Supported Communications Stacks

ShowCase Workstation provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

2.4.2   OSI Stack

Not supported.

2.4.3   TCP/IP Stack

ShowCase Workstation uses the TCP/IP stack from the Microsoft Windows operating system.

2.4.3.1   Physical Media Support

ShowCase Workstation is not dependent on the physical medium over which the TCP/IP executes.

2.4.4   Point-to-Point Stack

Not Supported.

2.5   Extensions/Specializations/Privatizations

ShowCase Workstation has no extensions, specializations or privatizations of SOP Classes and Transfer Syntaxes.

2.6   Configuration

The configuration of the ShowCase Workstation software is stored in local files. Configuration information can be entered via the graphical user interface provided in setup screens.

2.6.1   AE Title/Presentation Address Mapping

The AE Title for each computer running ShowCase Workstation is configurable through the graphical user interface.

The following configuration information is required for each DICOM node that acts as a Query or Store SCP for ShowCase Workstation:
- AE Title
- IP Address
- Port Number
- Connection Timeout
- Send Timeout
- Receive Timeout

This information is stored in a DICOM configuration file.

2.6.2   Configurable Parameters

Not Applicable

2.7   Support of Extended Character Sets

ShowCase Workstation supports the following character sets:

- ISO-IR 6 (default)   Default repertoire
- ISO-IR 100   Latin Alphabet No. 1

ShowCase Workstation does not support multi-byte characters.

3   MEDIA STORAGE CONFORMANCE STATEMENT

3.1   Introduction

This section describes ShowCase compliance to the DICOM Media Interchange standards. It details the DICOM Media Storage Application Profiles and roles that are supported.

The ShowCase Application provides DICOM interchange capabilities on any Windows volume, regardless of its status as approved DICOM compliant media. The ShowCase Application is a software product that operates in the Window environment. It creates, reads, writes, and updates image data in DICOM Media Interchange format on any Windows volume available.

3.2   Implementation Model

3.2.1   Application Data Flow Diagram

The Basic and Specific Application models for any windows disk volume are shown in the following diagram.
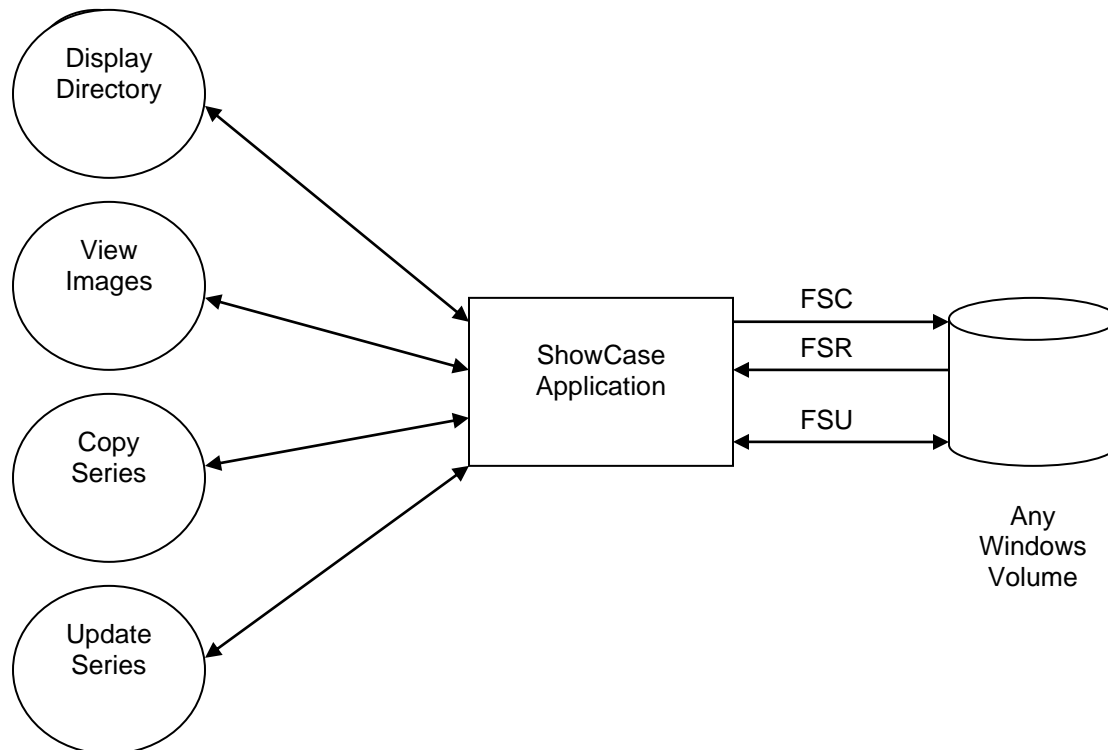
3.2.1.1   Description of the Data Flow Diagram for Any Windows Volume

The ShowCase Application Entity (AE) handles the Display Directory, View Images, Copy Series, and Update Series functionality for any Windows volume. The ShowCase Application Entity (AE) allows the user to perform DICOM Services on the DICOM media by interacting with buttons and menu items in the graphical user interface provided by the software.

3.2.2   Functional Definition of Application Entities

The ShowCase software has only one Application Entity: the ShowCase Application Entity.

The ShowCase Application Entity supports the following functions:

- Display a directory listing of the DICOM File Set (FSR)
- Display images from a DICOM File Set (FSR)
- Copy images from a DICOM File Set (FSR)
- Update or Delete DICOM File Sets (FSU)
- Create DICOM File Set on any attached Window Volume

3.2.3   Sequencing of Real World Activities

A DICOM File Set must exist on the media for a DICOM File Set to be updated. Typically a user reads a directory and selects and views an image series. The user might de-identify an image (paint out the patient name of other identifying information and update the DICOM header information) and then write it to media in DICOM format or export it in a non-DICOM format for teaching purposes.

3.2.4   File Meta Information for Implementation Class and Version

The ShowCase Application Entity uses the following implementation identifying parameters:

- Implementation Class UID   2.16.840.113857.100.98.19

3.3 Application Entity Specifications

3.3.1 ShowCase Application Entity Specification

The ShowCase Application Entity provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The Application Profiles and roles are listed in the following table. Note that the MOD AP's require that an MOD device is present on the computer running ShowCase. Likewise the CD and CDR AP's and DVD and DVDR AP's require the appropriate hardware/software on the computer.

ShowCase Exchange Media AP Support			
Supported AP's	**Real-World Activity**	**Roles**	**SC Option**
STD-US-ID-MF-MOD128 STD-US-SC-MF-MOD128 STD-US-ID-MF-MOD230 STD-US-SC-MF-MOD230 STD-US-ID-MF-MOD650 STD-US-SC-MF-MOD650 STD-US-SC-MF-CDR STD-XABC-CD STD-CTMR-CD STD-US-SC-MF-DVD STD-US-ID-MF-DVD	Display Directory	FSR	Interchange
STD-US-ID-MF-MOD128 STD-US-SC-MF-MOD128 STD-US-ID-MF-MOD230 STD-US-SC-MF-MOD230 STD-US-ID-MF-MOD650 STD-US-SC-MF-MOD650 STD-US-SC-MF-CDR STD-XABC-CD STD-CTMR-CD STD-US-SC-MF-DVD STD-US-ID-MF-DVD	View Images	FSR	Interchange
STD-US-ID-MF-MOD128 STD-US-SC-MF-MOD128 STD-US-ID-MF-MOD230 STD-US-SC-MF-MOD230 STD-US-ID-MF-MOD650 STD-US-SC-MF-MOD650 STD-US-SC-MF-CDR STD-XABC-CD STD-CTMR-CD STD-US-SC-MF-DVD STD-US-ID-MF-DVD	Copy Series	FSR	Interchange
STD-US-ID-MF-MOD128 STD-US-SC-MF-MOD128 STD-US-ID-MF-MOD230 STD-US-SC-MF-MOD230 STD-US-ID-MF-MOD650 STD-US-SC-MF-MOD650 STD-US-SC-MF-CDR STD-US-SC-MF-DVD	Update Series	FSU	Interchange

ShowCase Exchange Media AP Support			
Supported AP's	**Real-World Activity**	**Roles**	**SC Option**
STD-US-ID-MF-DVD			
STD-US-ID-MF-MOD128 STD-US-SC-MF-MOD128 STD-US-ID-MF-MOD230 STD-US-SC-MF-MOD230 STD-US-ID-MF-MOD650 STD-US-SC-MF-MOD650 STD-US-SC-MF-DVD STD-US-ID-MF-DVD	Create MOD	FSC	Interchange
STD-US-SC-MF-CDR	Create CD-R	FSC	Interchange
STD-US-SC-MF-DVD	Create DVD	FSC	Interchange

The ShowCase Application Entity provides support for SOP Classes shown in the following table. Note that "Uncompressed" means any of the three uncompressed transfer syntax designations; Implicit Little Endian, Explicit VR Little Endian, and Explicit VR Big Endian.

ShowCase SOP Class Support for Media Exchange			
Information Object Definition	**SOP Class UID**	**Transfer Syntax**	**Transfer Syntax UID**
DICOM Media Storage Directory	1.2.840.10008.1.3.10	Uncompressed	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless Process 14	1.2.840.10008.1.2.4.70
		Uncompressed	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Uncompressed	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2
		JPEG Lossless Process 14	1.2.840.10008.1.2.4.70
		RLE Lossless Image Compression	1.2.840.10008.1.2.5
		JPEG Lossy, Baseline	1.2.840.10008.1.2.4.50
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Uncompressed	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2
		JPEG Lossless Process 14	1.2.840.10008.1.2.4.70
		RLE Lossless Image Compression	1.2.840.10008.1.2.5
		JPEG Lossy, Baseline	1.2.840.10008.1.2.4.50

ShowCase SOP Class Support for Media Exchange			
Information Object Definition	**SOP Class UID**	**Transfer Syntax**	**Transfer Syntax UID**
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossless Process 14	1.2.840.10008.1.2.4.70
		Uncompressed	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossless Process 14	1.2.840.10008.1.2.4.70
		Uncompressed	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2
SC Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossless Process 14	1.2.840.10008.1.2.4.70
		Uncompressed	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2

3.3.1.1   File Meta Information for ShowCase Application Entity

The ShowCase Source Application Entity Title is not stored.

3.3.1.2   Real World Activities for the ShowCase Application Entity

The ShowCase Application Entity is used for the following real world activities:

- Display Directory Listing – ShowCase acts as a File-Set Reader.
- Viewing of Images - ShowCase acts as a File-Set Reader.
- Copy Series - ShowCase acts as a File-Set Reader and File Set Updater
- Modifying a Series - ShowCase acts as a File-Set Updater.
- De-identifying a Series – ShowCase de-identifies as described below and updates the file set.

3.3.1.2.1   Real World Activities – Writing Modified Images

ShowCase allows users to modify the actual image pixels when producing teaching files. The user can erase image areas for de-identification or they can add annotation text and arrows. **WHEN IMAGE DATA HAS BEEN EDITED**, the new image photometric interpretation may change as shown in the table below. Any compressed images are re-compressed to accommodate the changed image pixels.

ShowCase Transformations When Modifying Image Pixels							
Original Image				**Edited Image**			
Compression	Photometric Interpretation	Bits	Samples	Compression	Photometric Interpretation	Bits	Samples
None	RGB	8	3	None	RGB	8	3
None	MONOCHROME2 MONOCHROME1	8	1	None	RGB	8	3
None	MONOCHROME2 MONOCHROME1	16	1	None	RGB	8	3
Lossless JPEG	MONOCHROME2 MONOCHROME1	8	1	None	RGB	8	3
Lossless	MONOCHROME2	16	1	None	RGB	8	3

JPEG	MONOCHROME1						
None	YBR_FULL	8	3	None	RGB	8	3
RLE	YBR_FULL	8	3	RLE	YBR_FULL	8	3
Baseline Lossy JPEG	YBR_FULL_422	8	3	Baseline Lossy JPEG	YBR_FULL_422	8	3
None	PALLETTE COLOR	8	1	None	PALLETTE COLOR	8	1
None	PALLETTE COLOR	16	1	None	RGB	8	3

3.3.1.2.2 Real World Activities – De-identifying and Rewriting Images

ShowCase allows users to de-identify and save an image series for research studies.

When saving the series, the user interface allows users to reset the following elements to new values.

DICOM Element Name	DICOM Group	DICOM Element
PatientName	0x0010	0x0010
PatientID	0x0010	0x0020
AccessionNumber	0x0008	0x0050
StudyDescription	0x0008	0x1030
SeriesNumber	0x0020	0x0011
SeriesDescription	0x0008	0x103E

The DICOM elements highlighted in gray in the following table are not removed if the user chooses to "Leave physician names in record". The following DICOM elements are deleted when de-identifying:

DICOM Element Name	DICOM Group	DICOM Element
PatientBirthDateElement	0x0010	0x0030
PatientBirthTimeElement	0x0010	0x0032
OtherPatientIDsElement	0x0010	0x1000
OtherPtNameElement	0x0010	0x1001
PtAddressElement	0x0010	0x1040
PtMothersNameElement	0x0010	0x1060
PtMilitaryRankElement	0x0010	0x1080
PtMilitaryBranchElement	0x0010	0x1081
PtRecordLocatorElement	0x0010	0x1090
PtTelephoneElement	0x0010	0x2154
PtOccupationElement	0x0010	0x2180
PtHistoryElement	0x0010	0x21B0
PtCommentsElement	0x0010	0x4000
StudyIDElement	0x0020	0x0010
RefPhysElement	0x0008	0x0090
RefPhysAddrElement	0x0008	0x0092
RefPhysTeleElement	0x0008	0x0094
PhysicianOfRecordElement	0x0008	0x1048
PeformingPhysicianElement	0x0008	0x1050
ReadingPhysicianElement	0x0008	0x1060
OperatorsNameElement	0x0008	0x1070

When PatientBirthDateElement is set to zero length, the PatientAge is set and capped at 80 years. Type 2 attributes are set to zero length rather than being removed.

3.3.1.2.3 Real World Activity - Display Directory
The ShowCase Application is an FSR when reading the directory of a Windows volume. It displays the information as a list of Patients, Studies, or Series.

3.3.1.2.3.1 Media Storage Application Profile for the RWA - Display Directory
For the list of Application Profiles that invoke this AE for the Display Directory RWA, see Section 3.3.1. There are no extensions or specializations.

3.3.1.2.4   Real World Activity - View Images

The ShowCase Application is an FSR when a user is viewing images from the CD, MOD or other media.

The ShowCase Application supports the following image formats for viewing images. Note that "Uncompressed" means any of the three uncompressed transfer syntax designations; Implicit Little Endian, Explicit VR Little Endian, and Explicit VR Big Endian.

ShowCase Image Formats - Viewing Support					
Photometric Interpretation	Transfer Syntax	Bits Allocated	Bits Stored	Samples Per Pixel	Planar Config.
MONOCHROME1 or MONOCHROME2	Uncompressed	8	8	1	N/A
	Uncompressed	16	16	1	N/A
	RLE Lossless Image Compression 1.2.840.10008.1.2.5	8	8	1	N/A
	JPEG Lossless, Non-Hierarchical (Process 14) 1.2.840.10008.1.2.4.70	8	8	1	N/A
	JPEG Lossy Baseline (Process 1) 1.2.840.10008.1.2.4.50	8	8	1	N/A
RGB	Uncompressed	8	8	3	0 - Chunky
	Uncompressed	8	8	3	1 - Planar
PALETTE COLOR	Uncompressed	8	8	1	N/A
	JPEG Lossless, Non-Hierarchical (Process 14) 1.2.840.10008.1.2.4.70	8	8	1	N/A
	RLE Lossless Image Compression 1.2.840.10008.1.2.5	8	8	1	N/A
	Uncompressed	16	16	1	N/A
	JPEG Lossless, Non-Hierarchical (Process 14) 1.2.840.10008.1.2.4.70	16	16	1	N/A
	RLE Lossless Image Compression 1.2.840.10008.1.2.5	16	16	1	N/A
YBR_FULL	Uncompressed	8	8	3	0 - Chunky
	RLE Lossless Image Compression 1.2.840.10008.1.2.5	8	8	3	0 - Chunky
	RLE Lossless Image Compression 1.2.840.10008.1.2.5	8	8	3	1 - Planar
YBR_FULL_422	JPEG Lossy Baseline (Process 1) 1.2.840.10008.1.2.4.50	8	8	3	1 - Planar

3.3.1.2.4.1   Media Storage Application Profile for the RWA - View Images

For the list of Application Profiles that invoke this AE for the View Images RWA, see Section 3.3.1. There are no extensions or specializations.

3.3.1.2.5   Real World Activity - Copy a Series

The ShowCase Application is an FSR when the user is copying a series from one Windows volume to another. The ShowCase Application copies any SOP Instance with a valid Directory Record in the DICOMDIR.

3.3.1.2.5.1 Media Storage Application Profile for the RWA - Copy a Series

For the list of Application Profiles that can invoke this AE for the Copy Series RWA, see Table 3.3 .1. There are no extensions or specializations.

3.3.1.2.6 Real World Activity – Add or Delete a Series

The ShowCase Application is an FSU using the Interchange option when adding or deleting series to a Windows volume. The ShowCase Application copies any SOP Instance it views to a Windows volume. The ShowCase Application can delete any study from the directory of a Windows volume that can be written.

3.3.1.2.6.1 Media Storage Application Profile for the RWA - Add or Delete a Series

For the list of Application Profiles that can invoke this AE for the Add or Delete a Series RWA, see Section 3.3.1. There are no extensions or specializations.

3.4 Augmented and Private Application Profiles

The ShowCase Application has no augmented or private Application Profiles.

3.5 Extensions/Specializations/Privatizations

The ShowCase Application has no extensions, specializations or privatizations of SOP Classes and Transfer Syntaxes.

3.6 Configuration

The ShowCase Application has no DICOM configuration

3.7 Support of Extended Character Sets

The ShowCase Application supports the following character sets:
- ISO-IR 6 (default)   Default repertoire
- ISO-IR 100   Latin Alphabet No. 1

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