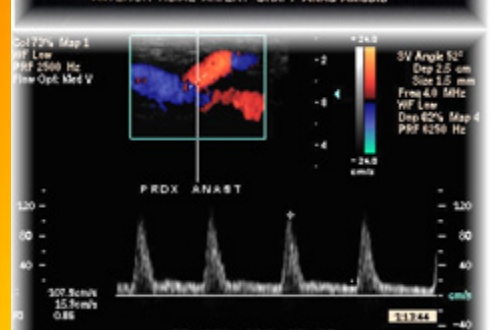
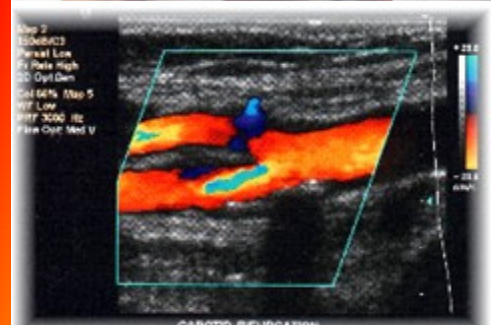


VascuPro™5

The Paperless Vascular Lab Registry!

DICOM Conformance Statement



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VascuPro Conformance Statement V2.0

Section 1: Introduction

1.1 Purpose

This document contains the DICOM 3.0 Conformance Statement for MiniPax, an imaging database system that provides storing and accessing capabilities for images. MiniPax is a Service Class Provider (SCP) for the storage SC. It is the mechanism by which Service Class Users (SCU's) of the storage SC can store DICOM image objects in the MinPax database.

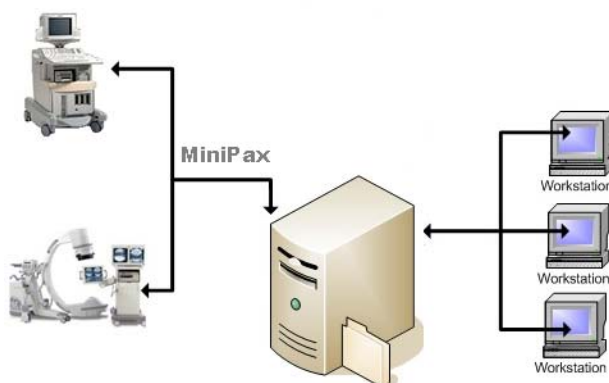
1.2 Abbreviations

- . **ACR** American College of Radiology
- . **AE** Application Entity
- . **CR** Computed Radiography
- . **CT** Computed Tomography
- . **DICOM** Digital Imaging and Communication in Medicine, from ACR/NEMA
- . **MR** Magnetic Resonance
- . **MRN** Medical Record Number
- . **NEMA** National Electrical Manufacturers Association
- . **NM** Nuclear Medicine
- . **RIS** Radiology Information System
- . **US** Ultrasound

Section 2: Implementation Model

MiniPax acquires and stores images sent by Modalities (e.g., Ultrasound) using the DICOM Storage Service Class. The application is implemented as Windows XP/2000 service running continuously in the background. MiniPax is configured to start automatically during computer start -up without any users logging into the Window system.

2.1 Application Data Flow Diagram



MiniPax assumes the role of Service Class Provider for the storage service class. It receives DICOM image objects and stores them in its own database. Users can access these images directly from within MiniPax and/or other clinical applications like VascuPro™ and VascuBase™. MiniPax renders DICOM images and SR data of imaging modalities readily available to VascuPro™ and other applications.

2.2 Functional Definition of Application Entity

MiniPax waits for an image archive to connect at the presentation address configured for its Application Entity Title. It will accept associations with Presentation Contexts for SOP Classes of the Storage Service Class. It will receive images on these Presentation Contexts and install them into database, along with study information and patient demographics extracted from the DICOM Image Information Object.

2.3 Sequencing of Real-World Activities

MiniPax completes the image storage activity prior to returning a status response to C-STORE command (e.g., a successful status response implies commitment of the image to the database).

3 Application Entity Specifications

3.1 MiniPax AE Specification

The *MiniPax* AE provides standard conformance to following DICOM 3.0 SOP classes:

```
VerificationSOPClass ComputedRadiographyImageStorage CTImageStorage
MRImageStorage NuclearMedicineImageStorage
RETIRED_NuclearMedicineImageStorage UltrasoundImageStorage
RETIRED_UltrasoundImageStorage UltrasoundMultiframeImageStorage
RETIRED_UltrasoundMultiframeImageStorage SecondaryCaptureImageStorage
XrayAngiographicImageStorage XrayAngiographicBiPlaneImageStorage
XrayFluoroscopyImageStorage StandaloneOverlayStorage
StandaloneCurveStorage StandaloneModalityLUTStorage
StandaloneVOILUTStorage RTImageStorage RTDoseStorage
RTStructureSetStorage RTPlanStorage PETImageStorage PETCurveStorage
VLImageStorage VLMultiFrameImageStorage PageDescriptionStorage
SRTextStorage SRAudioStorage SRDetailStorage SRComprehensiveStorage
BasicGrayscalePrintStorage BasicColorPrintStorage
ReferencedGrayscalePrintStorage ReferencedColorPrintStorage
WaveformStorage ECGWaveformStorage AudioWaveformStorage
"1.2.840.10008.1.1" "1.2.840.10008.5.1.4.1.1.1"
"1.2.840.10008.5.1.4.1.1.2" "1.2.840.10008.5.1.4.1.1.4"
"1.2.840.10008.5.1.4.1.1.20" "1.2.840.10008.5.1.4.1.1.5"
"1.2.840.10008.5.1.4.1.1.6.1" "1.2.840.10008.5.1.4.1.1.6"
"1.2.840.10008.5.1.4.1.1.3.1" "1.2.840.10008.5.1.4.1.1.3"
"1.2.840.10008.5.1.4.1.1.7" "1.2.840.10008.5.1.4.1.1.12.1"
"1.2.840.10008.5.1.4.1.1.12.3" "1.2.840.10008.5.1.4.1.1.12.2"
"1.2.840.10008.5.1.4.1.1.8" "1.2.840.10008.5.1.4.1.1.9"
"1.2.840.10008.5.1.4.1.1.10" "1.2.840.10008.5.1.4.1.1.11"
"1.2.840.10008.5.1.4.1.1.481.1" "1.2.840.10008.5.1.4.1.1.481.2"
"1.2.840.10008.5.1.4.1.1.481.3" "1.2.840.10008.5.1.4.1.1.481.5"
"1.2.840.10008.5.1.4.1.1.128" "1.2.840.10008.5.1.4.1.1.129"
"1.2.840.10008.5.1.4.1.1.77.1" "1.2.840.10008.5.1.4.1.1.77.2"
"1.2.840.10008.5.1.1.50" "1.2.840.10008.5.1.4.1.1.88.1"
```

"1.2.840.10008.5.1.4.1.1.88.2" "1.2.840.10008.5.1.4.1.1.88.3"
 "1.2.840.10008.5.1.4.1.1.88.4" "1.2.840.10008.5.1.4.1.1.27"
 "1.2.840.10008.5.1.4.1.1.28" "1.2.840.10008.5.1.4.1.1.29"
 "1.2.840.10008.5.1.4.1.1.30" "1.2.840.10008.5.1.4.1.1.9.1"
 "1.2.840.10008.5.1.4.1.1.9.1.1" "1.2.840.10008.5.1.4.1.1.9.1.2"

3.2 Association Establishment Policies

3.2.1 General

The maximum PDU size used by MiniPax is configurable with a minimum value of 2K, a default value of 16K and a maximum value of 64K.

3.2.2 Number of Associations

The number of concurrent associations supported by MiniPax is limited by the number of the available sessions. The total number of available sessions is determined by the licensing server.

3.2.3 Implementation Identifying Information

The implementation UID for MiniPax is .2.826.0.1.3680043.2.190.1 The implementation version is 2.0.

1. **3.2.4 Association Initiation by Real -World Activity**
2. **3.2.5 Association Acceptance Policy**
3. **3.2.6 Presentation Context Table**

MiniPax AE does not initiate Associations.

MiniPax places no limitation on who may connect to it.

Any of the presentation context shown in the following table are acceptable for MiniPax to receive images.

Table 1 - Acceptable Presentation Contexts for *MiniPax*

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID	Name		
Verification	1.2.840.10008.1.1	All in table 2	SCP	None
CR Image	1.2.840.10008.5.1.4.1.1.1	All in table 2	SCP	None
CT Image	1.2.840.10008.5.1.4.1.1.2	All in table 2	SCP	None
US Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	All in table 2	SCP	None
US Multi-frame	1.2.840.10008.5.1.4.1.1.3.1	All in table 2	SCP	None

Image				
MR Image	1.2.840.10008.5.1.4.1.1.4	All in table 2	SCP	None
NM Image (retired)	1.2.840.10008.5.1.4.1.1.5	All in table 2	SCP	None
US Image (retired)	1.2.840.10008.5.1.4.1.1.6	All in table 2	SCP	None
US Image	1.2.840.10008.5.1.4.1.1.6.1	All in table 2	SCP	None

Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	All in table 2	SCP	None
X-ray Angio-graphic Image	1.2.840.10008.5.1.4.1.1.12.1	All in table 2	SCP	None
X-ray Radio-fluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	All in table 2	SCP	None
X-ray Angio-graphic Biplane Image	1.2.840.10008.5.1.4.1.1.12.3	All in table 2	SCP	None
Stand Alone Curve	1.2.840.10008.5.1.4.1.1.9	All in table 2		
Stand Alone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	All in table 2	SCP	None
RT Image	1.2.840.10008.5.1.4.1.1.481.1	All in table 2	SCP	None
PET Image	1.2.840.10008.5.1.4.1.1.128	All in table 2		
NM Image	1.2.840.10008.5.1.4.1.1.20	All in table 2	SCP	None
Comprehensive Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.33		SCP	None

Table 2 Transfer Syntaxes:

Transfer Syntax	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
Explicit VR Big Endian	1.2.840.10008.1.2.2
JPEG Process1 (baseline)	1.2.840.10008.1.2.4.50
RLE Lossless	1.2.840.10008.1.2.5

3.2.6.1 SOP Specific Conformance for Storage

MiniPax conforms to the SOPs of the Storage Service Class at Level 2 (Full). In the event of a successful C-STORE operation, the image and the demographic data have been successfully written to MiniPax Database.

An error status of 0xC000 will be returned if one or more required attributes used by MiniPax are missing or wrongly coded. An error status of 0xA700 will be returned if the MiniPax database fails to store the image object.

3.2.6.2 Presentation Context Acceptance Criterion

MiniPax will accept any of the presentation context in table 1.

3.2.6.3 Transfer Syntax Selection Policies

MiniPax prefers to receive images encoded using Explicit Little Endian syntax.. If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

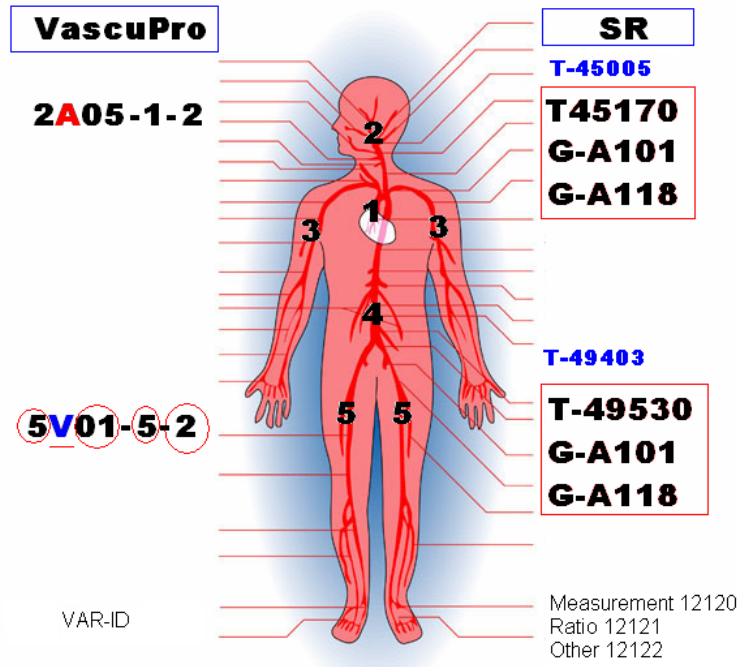
1. *Explicit VR Big Endian Syntax*
2. *Explicit VR Little Endian Syntax*
3. *Implicit VR Little Endian Syntax*
4. *RLE Lossless Syntax*
5. *JPEG Process1 (baseline) Syntax*

4 Structured Reports

We support storing all the following SR templates:

TID 5000 OB-GYN Ultrasound Procedure Report
TID 5100 Vascular Ultrasound Report
TID 5200 Echocardiography Procedure Report

VascuPro™ application for automating the non-invasive vascular lab only integrates the vascular template. VascuPro™ maps all measurements permutation supported by the DICOM vascular template and stores all these measurements into database. A sample of our mapping is given below. VascuPro™ instantly maps measurements, ratios and/or other vascular properties to the proper anatomical segment in a given SR.



5 Communication Profiles

5.1 Supported Communication Stacks

MiniPax provides DICOM 3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard

5.2 TCP/IP Stack

MiniPax inherits its TCP/IP stack from the Windows NT/98/95/2000/XP operating systems upon which it executes.

5.2.1 API

MiniPax uses the Winsock API to access the TCP/IP stack.

5.2.2 Physical Media Support

MiniPax is indifferent to the physical medium over which TCP/IP executes. It inherits this support from the Windows NT/98/95/2000/XP upon which it executes.

5.3 Extensions/Specializations/Privatizations

Not Applicable.

5.4 Configuration

MiniPax creates and change the configuration information using the admin tools provided in the *MiniPax* system.

5.4.1 Configurable Parameters

The following parameters can be configured by setting proper values in the database:

- . PDU size (in the database)
- . AE Title
- . Free Space Threshold
- . Database connection parameters

5.5 Supports for Extended Character Sets

MiniPax does not provide support for Extended Character Sets at this point in time.