

# DICOM Conformance Statement for Aegis 2.0

**Document Number:** SMI-0497

**Revision:** 1.0

**Status:** Approved

**Date:** December 22, 2008

**Author:** Dave Gallop

*Note: When printed, this is an uncontrolled copy, unless accompanied by approval signatures*

## APPROVALS

Software Architect	Software Development
Wes Hodges	
Signature:	Date:

## Mandatory Reviewers

*The undersigned have performed a review of this document*

Chief Technology Officer	Business Development
Gal Sela	
Signature:	Date:

DICOM Conformance Statement for Aegis 2.0  
SMI-0497

**Revision History**

<b>Revision</b>	<b>Date</b>	<b>Author</b>	<b>Changes</b>
1.0	Dec 22, 2008	Dave Gallop	Created

<b>1 INTRODUCTION</b> .....	4
<b>1.1 Purpose of this Document</b> .....	4
<b>1.2 Related Documents</b> .....	4
The Digital Imaging and Communications in Medicine (DICOM) standard. NEMA PS 3.1-13 2004 and Supplements. The ClearCanvas Workstation 1.1. DICOM Conformance statement (available at <a href="http://www.clearcanvas.ca/dnn/Portals/0/Distributions/Workstation_1_1/CCWorkstationDCS.pdf">http://www.clearcanvas.ca/dnn/Portals/0/Distributions/Workstation_1_1/CCWorkstationDCS.pdf</a> ), .....	4
<b>1.3 Scope</b> .....	4
<b>1.4 Acronyms and Abbreviations</b> .....	4
<b>1.5 Important note to the reader</b> .....	4
<b>2 THE CLEARCANVAS FRAMEWORK</b> .....	6
<b>3 EXTENSIONS TO THE CLEARCANVAS WORKSTATION 1.1 DICOM IMPLEMENTATION</b> .....	7
<b>3.1 Extensions to the FIND SCP</b> .....	7
Aegis 2.0 extends ClearCanvas functionality by including support for incoming queries at the SERIES level (ClearCanvas only supports STUDY level queries). 7	
<b>3.2 Extensions to the FIND SCU</b> .....	8
As in the case of the FIND SCP, Aegis 2.0 extends ClearCanvas functionality by including support for making queries at the SERIES level. The following attributes are included in the request: .....	8
<b>3.3 Extensions for image capture and creation</b> .....	9

## 1 INTRODUCTION

### 1.1 Purpose of this Document

This document is the DICOM Conformance Statement for Sentinelle's Aegis software. The purpose of this document is to describe how the workstation interacts with other DICOM devices on the network.

### 1.2 Related Documents

The Digital Imaging and Communications in Medicine (DICOM) standard. NEMA PS 3.1-13 2004 and Supplements. The ClearCanvas Workstation 1.1. DICOM Conformance statement (available at [http://www.clearcanvas.ca/dnn/Portals/0/Distributions/Workstation\\_1\\_1/CCWorkstationDCS.pdf](http://www.clearcanvas.ca/dnn/Portals/0/Distributions/Workstation_1_1/CCWorkstationDCS.pdf) ),

### 1.3 Scope

This DICOM Conformance Statement documents the conformance of Sentinelle Aegis with the Digital Imaging and Communications in Medicine (DICOM) standard. This document is essential in order to evaluate whether or not another DICOM compliant device can communicate with this software product. This statement is conformant with the recommended format as described in PS 3.2 of the DICOM standard.

### 1.4 Acronyms and Abbreviations

DICOM abbreviations are used throughout this Conformance Statement. For a description of these, consult the DICOM standard publication.

### 1.5 Important note to the reader

The use of this conformance statement by itself does not guarantee successful interoperability of Sentinelle software with equipment from other vendors. The user or integrator of Sentinelle software should keep the following issues in mind:

1. Successful interoperability of the workstation with other devices may require functions that are not specified within the scope of DICOM. It is the user's or integrator's responsibility to ensure that the proper analysis and validation is performed to verify the connection.

2. Test procedures should be used to verify that data transferred into the workstation is correct. This is often done with the aid of phantom scans using a variety of clinical protocols.

3. Test procedures should be used to verify connectivity. Issues such as full database and broken connections should be verified.

4. The current version of this DICOM Conformance Statement is also available on the Sentinelle Medical Inc. web page at <http://www.sentinellemedical.com>

5. The DICOM standard will continually evolve to meet new user requirements. Sentinelle will follow the changes in the standard by implementing new features as specified by the standard. Sentinelle reserves the right to make changes to its products or to discontinue its delivery. The user or integrator should ensure that any non-Sentinelle device providers, which connect with Sentinelle devices, should also follow the standard. Failure to do so will likely result in future connectivity problems.

## **2 THE CLEARCANVAS FRAMEWORK**

Aegis 2.0 relies almost exclusively on the DICOM implementation provided by the ClearCanvas framework. As such, the vast majority of DICOM functionality is covered by the ClearCanvas Workstation DICOM conformance statement. This document is available at:

[http://www.clearcanvas.ca/dnn/Portals/0/Distributions/Workstation\\_1\\_1/CCWorkstationDCS.pdf](http://www.clearcanvas.ca/dnn/Portals/0/Distributions/Workstation_1_1/CCWorkstationDCS.pdf)

However, Aegis 2.0 does provide extend some of the DICOM capabilities of the ClearCanvas framework, and it is these extensions that will be covered in detail in following sections.

### 3 EXTENSIONS TO THE CLEARCANVAS WORKSTATION 1.1 DICOM IMPLEMENTATION

#### 3.1 Extensions to the FIND SCP

Aegis 2.0 extends ClearCanvas functionality by including support for incoming queries at the SERIES level (ClearCanvas only supports STUDY level queries).

Only those attributes that are requested are returned in a C-FIND response. Some optional requested attributes will be returned as illustrated in the following table:

**Table 3.1-1  
STUDY ROOT REQUEST IDENTIFIER FOR FIND-SCP**

Name	Tag	Types of Matching
<b>STUDY Level</b>		
Study Instance UID	(0020, 000D)	UNIQUE
Patient's ID	(0010,0020)	S,*,U
Patient's Name	(0010,0020)	S,*,U
Patient's Birth Date	(0010,0030)	NONE
Study Description	(0008, 1030)	S,*,U
Study Date	(0008,0020)	S,U,R
Study Time	(0008,0030)	U
Study ID	(0020,0010)	S,*,U
Accession Number	(0008, 0050)	S,*,U
<b>SERIES Level</b>		
Series Instance UID	(0020, 000E)	UNIQUE
Modality	(0008, 0060)	S,*,U
Series Description	(0008, 103E)	S,*,U
Series Number	(0020, 0011)	S,*,U
Number Of Series Related Instances	(0020, 1209)	S,*,U
<b>IMAGE Level</b>		
N/A		
<b>Common to all query levels</b>		
Specific Character Set	(0008, 0005)	U

Types of Matching:

An "S" indicates the identifier attribute uses Single Value Matching, an "R" indicates Range Matching, an "\*" indicates wildcard matching, a "U" indicates Universal Matching, and an "L" indicates that UID lists are sent. "NONE" indicates that no matching is supported, but that values for this Element are requested to

be returned (i.e. universal matching), and “UNIQUE” indicates that this is the Unique Key for that query level, in which case Universal Matching or Single Value Matching is used depending on the query level.

Aside from the support of series level queries, no other changes have been made to ClearCanvas FIND SCP functionality.

### 3.2 Extensions to the FIND SCU

As in the case of the FIND SCP, Aegis 2.0 extends ClearCanvas functionality by including support for making queries at the SERIES level. The following attributes are included in the request:

**Table 3.2-1  
STUDY ROOT REQUEST IDENTIFIER FOR FIND-SCU**

<b>Name</b>	<b>Tag</b>	<b>Types of Matching</b>
<b>STUDY Level</b>		
Study Instance UID	(0020, 000D)	UNIQUE
Patient’s ID	(0010,0020)	S,*,U
Patient’s Name	(0010,0020)	S,*,U
Patient’s Birth Date	(0010,0030)	NONE
Study Description	(0008, 1030)	S,*,U
Study Date	(0008,0020)	S,U,R
Accession Number	(0008, 0050)	S,*,U
<b>SERIES Level</b>		
Series Instance UID	(0020, 000E)	UNIQUE
Modality	(0008, 0060)	S,*,U
Series Description	(0008, 103E)	S,*,U
Series Number	(0020, 0011)	S,*,U
Number Of Series Related Instances	(0020, 1209)	S,*,U
<b>IMAGE Level</b>		
N/A		
<b>Common to all query levels</b>		
Specific Character Set	(0008, 0005)	U

Types of Matching:

An "S" indicates the identifier attribute uses Single Value Matching, an "R" indicates Range Matching, an "\*" indicates wildcard matching, a 'U' indicates Universal Matching, and an 'L' indicates that UID lists are sent. "NONE" indicates that no matching is supported, but that values for this Element are requested to be returned (i.e. universal matching), and "UNIQUE" indicates that this is the

Unique Key for that query level, in which case Universal Matching or Single Value Matching is used depending on the query level.

Aside from the support of series level queries, no other changes have been made to ClearCanvas FIND SCU functionality.

### 3.3 Extensions for image capture and creation

Aegis 2.0 generates DICOM images in two different circumstances: report generation and 2D or 3D motion correction. The following table lists the attributes set during image creation, sorted by module:

**Table 3.3-1  
ATTRIBUTE LIST FOR SECONDARY CAPTURE IMAGES**

Attribute Name	Tag	Value
<b>PATIENT Module</b>		
Patient name	(0010, 0010)	Copied from the source image
Patient ID	(0010, 0020)	Copied from the source image
Patient Birthdate	(0010, 0030)	Copied from the source image
Patient Sex	(0010, 0040)	Copied from the source image
<b>General Study Module</b>		
Study Instance UID	(0020, 000D)	Copied from the source image
Study Date	(0008, 0020)	Copied from the source image
Study Time	(0008, 0030)	Copied from the source image
Referring Physicians Name	(0008, 0090)	Copied from the source image
Study ID	(0020, 0010)	Copied from the source image
Accession Number	(0008,0050)	Copied from the source image
Study Description	(0008, 1030)	Copied from the source image
<b>Patient Study Module</b>		
Patient Age	(0010, 1010)	Copied from the source image
<b>General Series Module</b>		
Modality	(0008,0060)	<b>Report images:</b> Set to 'OT' . <b>Motion Correction:</b> Copied from the source image.
Series Instance UID	(0020, 000E)	Unique value created for the series
Series Number	(0020, 0011)	<b>Report images:</b> Set to '50000'. <b>2D Motion Correction:</b> Set to 13000 + source image value. <b>3D Motion Correction:</b> Set to 14000 + source image value.
Series Date	(0008, 0021)	The date at which the series was created.
Series Time	(0008, 0031)	The time at which the series was

		created.
Protocol Name	(0018, 1030)	Copied from the source image.
Series Description	(0008, 103E)	<b>Report Images:</b> Set to "BREAST REPORT" <b>2D Motion Correction:</b> '2D MOCO' is appended to the start of the source image value. <b>3D Motion Correction:</b> '3D MOCO' is appended to the start of the source image value.
<b>General Equipment Module</b>		
Institution Name	(0008,0080)	Copied from the source image.
Institution Address	(0008, 0081)	Copied from the source Image.
<b>General Image Module</b>		
Instance Number	(0020, 0013)	Images are number sequentially
Content Date	(0008, 0023)	The date at which the image was created
Content Time	(0008, 0033)	The time at which the image was created
Image Type	(0008, 0008)	DERIVED\SECONDARY
Acquisition Date	(0008, 0022)	<b>Report Images:</b> The time at which the image was created. <b>Motion Correction:</b> Copied from the source image.
Acquisition Time	(0008, 0032)	<b>Report Images:</b> The time at which the image was created. <b>Motion Correction:</b> Copied from the source image.
<b>SOP Common Module</b>		
SOP Instance UID	(0008, 0018)	Unique value for each image
Specific character set	(0008, 0005)	<b>Report Images:</b> ISO_IR 100. <b>Motion Correction:</b> Copied from source image.
Samples Per Pixel	(0028, 0002)	<b>Report Images:</b> 3 <b>Motion Correction:</b> Copied from source image.
Photometric Interpretation	(0028, 0004)	<b>Report Images:</b> RGB <b>Motion Correction:</b> Copied from source image.
Planar Configuration	(0028, 0006)	<b>Report Images:</b> 0 <b>Motion Correction:</b> Copied from source image.
Rows	(0028, 0010)	<b>Report Images:</b> 1754 <b>Motion Correction:</b> Copied from source image.
Columns	(0028,0011)	<b>Report Images:</b> 1240

DICOM Conformance Statement for Aegis 2.0  
 SMI-0497

		<b>Motion Correction:</b> Copied from source image.
Bits Allocated	(0028, 0100)	<b>Report Images: 8</b> <b>Motion Correction:</b> Copied from source image.
Bits Stored	(0028, 0101)	<b>Report Images: 8</b> <b>Motion Correction:</b> Copied from source image.
High Bit	(0028, 0102)	<b>Report Images: 7</b> <b>Motion Correction:</b> Copied from source image.
Pixel Representation	(0028, 0103)	<b>Report Images: 0</b> <b>Motion Correction:</b> Copied from source image.
Pixel Data	(7FED, 0010)	<b>Report Images:</b> Rasterized PDF document. <b>Motion Correction:</b> Generated by Motion Correction algorithm
<b>Secondary Capture Equipment Module</b>		
Conversion Type	(0008, 0064)	"WSD"
Secondary Capture Device ID	(0018, 1010)	<b>Report Images:</b> "SENTINELLE BRIGHT" <b>Motion Correction:</b> "SENTINELLE AEGIS"
Secondary Capture Device Manufacturer	(0018,1016)	"SENTINELLE MEDICAL INC"
Secondary Capture Device Software Versions	(0018, 1019)	Version of software used.
<b>Secondary Capture Image Module</b>		
Date of Secondary Capture	(0018, 1012)	The date at which the image was created.
Time of Secondary Capture	(0018, 1014)	The time at which the image was created.