



a VCA ANTECH company

**VetPACS Review DICOM
Conformance Statement**



Version 1.1

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picture | archival | communication | system

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Version History

Date	Version	Person	Description
6/24/2006	1.0	Dan Blanchard	Created
7/05/2006	1.1	Dan Blanchard	Added Section 9 on mapping

DICOM Conformance Statements and Version Histories are released regularly. For additional assistance with our product's latest DICOM and interconnectivity statements, in addition to or beyond the scope of what is stated herein, please contact Sound Technologies at support@soundvet.com or (800) 268-5354.

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VetPACS Review™ DICOM Conformance Statement

NOTE: Some settings must be changed by the service person in order to use or change the function marked with a “*”.

1. Introduction

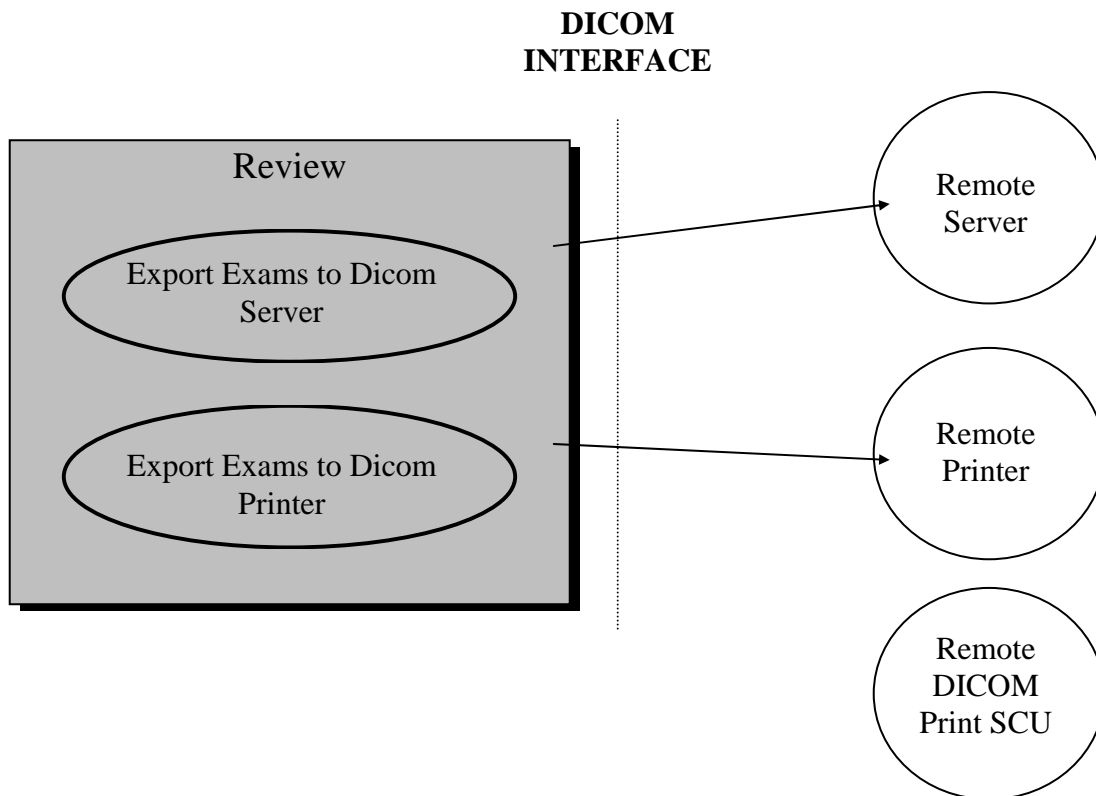
This Conformance Statement specifies the Sound Technologies Review compliance to DICOM V3.0.

2. Implementation Model

Sound Technologies VetPACS Review sends DICOM images by using DICOM Storage Service Class or DICOM Print Management Service Class. It can import dicom files as well as view other DICOM images stored to Nucleus Server or acquired by VetPACS TruDR™.

2.1 Application Data Flow Diagram

Sound Technologies Review sends DICOM images by using Storage Service Class, or to the printer by using Print Management Service Class.



2.2 Functional Definition of AE's

Sound Technologies Review may send DICOM images to DICOM server hsby using Storage Service Class, or it is sent to the printer by using Print Management Service Class.

The Application Entity of Sound Technologies Review also acts as an SCU for the Verification SOP classes.

2.3 Sequencing of Real-World Activities

Not applicable.

3. AE Specifications

Sound Technologies Review generates a single association establishment request and operates as an application entity. Sound Technologies Review is defined by the following SOP:

SOP Class as SCU	
UID Name	UID Value
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Annotation Box SOP Class	1.2.840.10008.5.1.1.15
Verification (Echo)	1.2.840.10008.1.1
* Unknown IOD Storage	* See note

NOTE: This will initiate outgoing DICOM C-STORE requests masquerading as any stored IOD module. The behavior of this outgoing association link will be like the DICOM defined SCU role: Storage Service Class.

Also, the SOP Class of the above Basic Grayscale Print Management Meta is defined as follows:

Basic Grayscale Print Management Meta SOP Class		
SOP Class Name	SOP Class UID	Comment
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	
Printer SOP Class	1.2.840.10008.5.1.1.16	Used for collecting printer information when DICOM Printer Service is used.

Sound Technologies Review supports the following Transfer Syntax and Compression Modes when executing a C-Store: (compression setting can be changed in the Dicom Servers tab in Application Settings)

Compression Modes		
Configuration	Proposed Transfer Syntaxes	Name
0 (Uncompressed)	1.2.840.10008.1.2	Implicit Little Endian
1 (Send As Is)	<Transfer syntax in image>	<Transfer syntax in image>
	1.2.840.10008.1.2	Implicit Little Endian
2 (Send As Is With Default Transfer Syntax)	1.2.840.10008.1.2	Implicit Little Endian
3 (Jpeg Lossless)	1.2.840.10008.1.2.4.70	JPEG Lossless sv1
	1.2.840.10008.1.2	Implicit Little Endian

Compression Modes		
Configuration	Proposed Transfer Syntaxes	Name
4 (Jpeg Lossy)	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2	JPEG extended (12 bits) Implicit Little Endian

Note: The transfer syntaxes are listed in order of priority. I.e., if a host is configured as 3 (Jpeg Lossless) and it accepts JPEG lossless, the image will be lossless JPEG compressed before transmission, even if it was not stored in that way. If the host does not accept Jpeg Lossless, it will send it out Uncompressed with Default Transfer Syntax (Implicit Little Endian)

- 0 (Uncompressed). Images will be decompressed prior to transmission and sent with default transfer syntax (ImplicitLittleEndian, 1.2.840.10008.1.2).
- 1 (Send As Is) Sends image with the transfer syntax specified in the file. It is recommended that the host be configured to receive all possible transfer syntaxes.
- 2 (Send As Is With Default Transfer Syntax). The configuration “as” will transmit images as-is. Independent of how images are stored on disk (with JPEG or NKI compression), they will be transmitted over an ImplicitLittleEndian connection. This behavior does not conform to the DICOM standard and for many hosts this may therefore not work. NKI clients will work, though.
- 3 (Jpeg Lossless). Will attempt to send with Jpeg Lossless (1.2.840.10008.1.2.4.70) if the host accepts it, otherwise, it will send it as configuration 0 (Uncompressed)
- 4 (Jpeg Lossy). Will attempt to send with Jpeg Extended Lossy (1.2.840.10008.1.2.4.71) if the host accepts it, otherwise, it will send it as configuration 0 (Uncompressed)

Jpeg compression is performed by utility from the OFFIS DICOM toolkit DCMTK version 3.5.3. This executable is called by Nucleus to compress DICOM images in jpeg format. Copyright (C) 1994-2004, OFFIS. This software and supporting documentation were developed by Kuratorium OFFIS e.V. Healthcare Information and Communication Systems Escherweg 2 D-26121 Oldenburg, Germany. This software is made available, as is, and OFFIS makes no warranty regarding the software, its performance, its merchantability or fitness for any particular use, freedom from any computer diseases or its conformity to any specification. The entire risk as to quality and performance of the software is with the user. Copyright of the software and supporting documentation is, unless otherwise stated, owned by OFFIS, and free access is hereby granted as a license to use this software, copy this software and prepare derivative works based upon this software. However, any distribution of this software source code or supporting documentation or derivative works (source code and supporting documentation) must include the three paragraphs of this copyright notice.

3.1 Association Establishment Policies

3.1.1 General

Sound Technologies Review generates association establishment request for the server or the printer when image data (DX image) to be sent is acquired. Maximum size of PDU which is used is 128K*.

3.1.2 Number of Associations

Sound Technologies Review generates association establishment request.

3.1.3 Asynchronous Nature

Asynchronous mode is not supported.

3.1.4 Implementation Identifying Information

Not applicable.

3.2 Association Acceptance Policy

Sound Technologies Review establishes association by sending establishment request to the server or printer when image data (DX image) to be.

3.2.1 Related Real-World Activity

Storage Service Class:

AE sends C-STORE request for sending image.

Print Service Class:

AE sends N-CREATE request for making film session and film box.

Then, it sends N-SET request for sending image data.

Finally, it sends N-ACTION request for printing the image on film, and N-DELETE for deleting the film session.

4. Communication Profiles

4.1 Supported Communication Stack

Sound Technologies Review provides DICOM V3.0 TCP/IP network communication support as stated in DICOM Standard Part 8.

4.2 TCP/IP Stack

Sound Technologies Review inherits TCP/IP stack.

4.3 Physical Media Support

Sound Technologies Review supports 10BASE-T, 100BASE-TX, 10BASE-2 (option) and 10BASE-5 (option) of ETHERNET™¹.

5. Extension / Specialization / Privatization

Not applicable.

6. Configurable Parameters

Dicom Servers and Printers available from Application Settings.

7. Support of Extended Character Sets

Sound Technologies Review supports extended character sets. Defined terms for single-byte character sets without code extensions:

Character Set Description	Defined Term	ISO registration number	Number of characters	Code element	Character Set
Default repertoire	None	ISO-IR 6	94	G0	ISO 646:
Latin alphabet No.1	ISO_IR 100	ISO-IR 100	96	G1	Supplementary set
		ISO-IR 6	94	G0	ISO 646:
Latin alphabet No.2	ISO_IR 101	ISO-IR 101	96	G1	Supplementary set
		ISO-IR 6	94	G0	ISO 646:
Cyrillic	ISO_IR 144	ISO-IR 144	96	G1	Supplementary set
		ISO-IR 6	94	G0	ISO 646:

¹ Ethernet is a trademark of Xerox Corporation

8. Entity

Not applicable.

9. Mapping From Dicom Tags To VetPACS Database For Store

There is an internal XML file in Nucleus (DefaultMapping.xml) that defines the mapping from Dicom Tags to VetPACS database tables.

For each database column there is a mapping type. Here is a description of them:

Mapping Type	Description
Application Setting	Application Setting.
Client User Mapping	Special mapping for the Patient's Client User
Dicom Tag	Simple mapping from Dicom Tag to Database value.
CodeTableLookup	Lookup to VetPACS Codes table
Constant	Constant value
Other Table Mapping	Value from column in another table.

9.1 Mapping From Dicom Tags To Patients Table

Database Column	Mapping Type	Tag Name or Value	Element Tag	Type	Notes
ClinicGuid	Application Setting	ClinicGuid	N/A	R	Application Setting
PatientID	Dicom Tag	Patient ID	(0010,0020)	R	PatientID
PatientName	Dicom Tag	Patient Name	(0010,0010)	R	See Note 1
ClientGuid / Client Name	Client User Mapping	Patient Name	(0010,0010)	R	See Note 2
		ClientName*	(F001,F10A)	O	
		ClientNameGuid*	(F001,F11D)	O	
PatientBirthDate	Dicom Tag	Patient Birth Date	(0010,0030)	O	VetPACS Patient BirthDate is a datetime, combines both dicom tags
		Patient Birth Time	(0010,0032)	O	
PatientSize	Dicom Tag	Patients Size	(0010,1020)	O	
Weight	Dicom Tag	Patients Weight	(0010,1030)	O	Convert from KG to lbs.
PatientComments	Dicom Tag	Patient Comments	(0010,4000)	O	
SexCode	CodeTableLookup	Patient Sex Extended*	(F001:F103)	O	Use extended private tag if it exists, otherwise standard tag
		Patient Sex	(0010,0040)	O	
SpeciesCode	CodeTableLookup	PatientSpecies*	(F001,F100)	O	
CategorySizeCode	CodeTableLookup	Patient Category Size*	(F001,F102)	O	
BreedCode	CodeTableLookup	Patient Breed*	(F001,F102)	O	
Hide	Constant	1			Ensures that Patient is visible

					from VetPACS
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* Denotes Sound Technologies Private Tags

Note 1: For PatientName, this is parsed from the PatientName (0010,0010) Dicom Tag. If this value is formatted with the DICOM Person Name VR (in format LastName^FirstName^MiddleName^NamePrefix^NameSuffix) then PatientName will be the FirstName part. If the value is not formatted in Person Name VR, then the PatientName will be the entire value. NOTE: if this patient ID already exists in the database, the patient Name will NOT be updated, because there is a good chance that it has been edited because there is no standard PatientName and ClientName dicom tags.

Note 2: For Client Name / Client Guid, if the ClientGuid (0010, 0040) and ClientName (F001,F10A) private tags exists, we use these for the Client Name. If these do not exist, then we parse the client name from the PatientName (0010, 0010) value. If PatientName value is in DICOM Person Name format (LastName^FirstName^MiddleName^NamePrefix^NameSuffix), then we use this mapping from the parts of Person Name VR:

- LastName = Client Last Name
- Middle Name = Client Middle Name
- Name Prefix = Client Name Prefix
- Name Suffix = Client Name Suffix

If the PatientName value is not in DICOM Person Name VR, then we will use the entire PatientName as the ClientLastName. It is expected that a VetPACS user will fix this data, so if the patient ID already exists in the database, then the client name associated with it will not be updated.

9.2 Mapping From Dicom Tags To Exams (Studies) Table

Database Column	Mapping Type	Tag Name or Value	Element Tag	Type	Notes
ClinicGuid	Application Setting	ClinicGuid	N/A	R	Application Setting
StudyInstanceUid	Dicom Tag	Study Instance Uid	[0020,000D]	R	
StudyID	Dicom Tag	Study ID	[0020,0010]	R	
AccessionNumber	Dicom Tag	Accession Number	[0008,0050]	O	
CreateDate	Dicom Tag	Study Date	[0008,0020]	O	
		Study Time	[0008,0030]		
Complaint	Dicom Tag	Exam Complaint *	[F001,F113]	O	Use extended private tag if it exists, otherwise standard tag
		Study Description	[0008,1030]	O	
ExamVetGuid	UserColumnMapping	Physician Of Record	[0008,1048]	O	See Note 1
		Referring Physician's Name	[0008,0090]		
		DefaultExamVetGuid	AppSetting		

CreatedByGuid	UserColumnMapping	ExamCreatedBy*	[F001,F117]	O	
		ExamCreatedByGuid *	[F001,F117]		
		ExamCreatedByGroup*	[F001,F118]		
SOAP	Dicom Tag	ReasonForStudy *	[F001,F110]	O	
PatientGuid	Other Table Mapping	PatientGuid from record in Patients table			
ClientGuid	Other Table Mapping	ClientGuid from record in Patients table			
RefId	Dicom Tag	ExamRefId *	[F001,F10D]	O	
RequiredByDate	Dicom Tag	ExamRequiredByDateTime *	[F001,F119]	O	
DiagnosisCode	CodeTableLookup	ExamDiagnosis *	[F001,F116]	O	
ExamID	Dicom Tag	TelemedExamID *	[F001,F11B]	O	
WebCode	Dicom Tag	ExamWebCode *	[F001,F114]	O	
CategoryCode	CodeTableLookup	ExamCategory *	[F001,F115]	O	
FolderCode	Constant	0		R	
StateCode	Constant	0		R	
Hide	Constant	1		R	Ensures that Patient is visible from VetPACS

* Denotes Sound Technologies Private Tags

Note 1: ExamVetGuid is determined as follows: if we cannot find Physician of Record or Referring Physician's Name as an ExamVet in the Users table, we will use the configured Default Exam Vet Guid (Nucleus Server) the configured User (VetPACS Review or TruDR).

9.3 Mapping From Dicom Tags To Series Table

Database Column	Mapping Type	Tag Name or Value	Element Tag	Type	Notes
ModalityId	LookupTable	Modality	[0008,0060]	R	Lookup to Modalities table
SeriesInstanceUid	Dicom Tag	Series Instance UID	[0020,000E]	R	
SeriesNumber	Dicom Tag	Series Number	[0020,0011]	O	
SeriesDescription	Dicom Tag	Series Description	[0008,103E]	O	
CreateDate	Dicom Tag	Series Date	[0008,0021]	O	
		Series Time	[0008,0031]		
ProtocolName	Dicom Tag	Protocol Name	[0018,1030]	O	
ExamGuid	Other Table Mapping	Guid from record in Exams table			

9.4 Mapping From Dicom Tags To Captures (Images) Table

Database Column	Mapping Type	Tag Name or Value	Element Tag	Type	Notes
AbstractSyntaxId	LookupTable	SOP Class UID	[0008,0016]	R	Lookup to AbstractSyntaxes table
SopInstanceUid	Dicom Tag	SOP Instance UID	[0008,0018]	R	

FileSuffix	Application Setting	FileExtension		R	
Description	Dicom Tag	Accession Number	[0008,0050]	O	
CreateDate	Dicom Tag	Acquisition date	[0008,0022]	O	If Acq Date/Time doesn't exist, then use Content Date/Time
		Acquisition time	[0008,0032]		
		Content Date	(0008,0023)		
		Content Time	(0008,0033)		
TagBurnedInImage	Dicom Tag	Burned In Annotation	[0028,0301]	O	
ImageCompression Code	CodeTableLookup	Image Compression	[0028,2110]	O	
InputTypeCode	CodeTableLookup	CaptureInputType *	[F001,F112]	O	
CaptureTypeCode	Capture Type Lookup	CaptureType *	[F001,F11A]	O	See Note 1
OrderValue	Constant	0	N/A	R	See Note 2
FileExistsOnClient Code	Constant	1	N/A	R	
ExamGuid	Other Table Mapping	Guid from record in Exams table			
SeriesGuid	Other Table Mapping	SeriesGuid from record in Series table			

* Denotes Sound Technologies Private Tags

Note 1: If the CaptureType private tag does not exist, the Capture Type Code value will be determined by Modality tag value:

- "US" = 11
- "CT" = 7
- "MR" = 8
- "DX" = 9
- "CR" = 10

Note 2: OrderValue will be set to 0, so VetPACS database sets the next value for captures in the same exam.