

Positron Emission Tomography System

SET-5001

SET-5002

DICOM Conformance Statement

These specifications may be changed for improvement without notice.

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Revision History

Date	Revision Code	Description
Dec, 20120	First version	Newly created

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0. Introduction

0.1 Overview

This document is a statement of conformance to DICOM standards for the Positron Emission Tomography (PET) system “SET-5001” and “SET-5002”. It specifically applies to the implementation of DICOM functionality in the positron emission tomography portion of the PET system.

This DICOM functionality is operated based on DICOM verification, storage, and query/retrieve model service classes.

This document is intended for readers familiar with how the in-hospital network where DICOM is used is configured.

The content of this document conforms to the DICOM version 3.0 Part 2: Conformance.

0.2 Definitions

- Association is the first phase of communication between two DICOM application entities (AE). AEs use association to negotiate how data is encoded.
- DICOM message service elements (DIMSE) define the services and protocols used by AEs when exchanging messages.
- Information object definitions (IOD) are abstract data models for information about real-world activities.
- Service class providers (SCP) function as a server that executes operations to invoke notifications during association.
- Service class users (SCU) function as a client that executes operations to invoke notifications during association.
- A service-object pair (SOP) class is a group of DIMSEs defined as an IOD combination.

0.3 Acronyms, Abbreviations, and Symbols

- ACR: American College of Radiology
- ACSE: Association Control Service Element
- AE: Application Entity
- ANSI: American National Standards Institute
- AP: Application Profile
- API: Application Programming Interface
- ASCII: American Standard Code for Information Interchange
- CEN TC251: Comité Européen de Normalisation – Technical Committee 251 – Medical Informatics
- DICOM: Digital Imaging and Communications in Medicine
- DIMSE: DICOM Message Service Element
- DIMSE-C: DICOM Message Service Element-Composite
- DIMSE-N: DICOM Message Service Element-Normalized
- FSC: File-set Creator
- FSR: File-set Reader
- FSU: File-set Updater
- HISPP: Healthcare Informatics Standards Planning Panel
- HL7: Health Level 7
- IE: Information Entity
- IEEE: Institute of Electrical and Electronics Engineers
- IOD: Information Object Definition
- ISO: International Standards Organization
- ISP: International Standardized Profile
- JIRA: Japanese Industry Radiology Apparatus
- MSDS: Healthcare Messages Standard Developers Sub-Committee

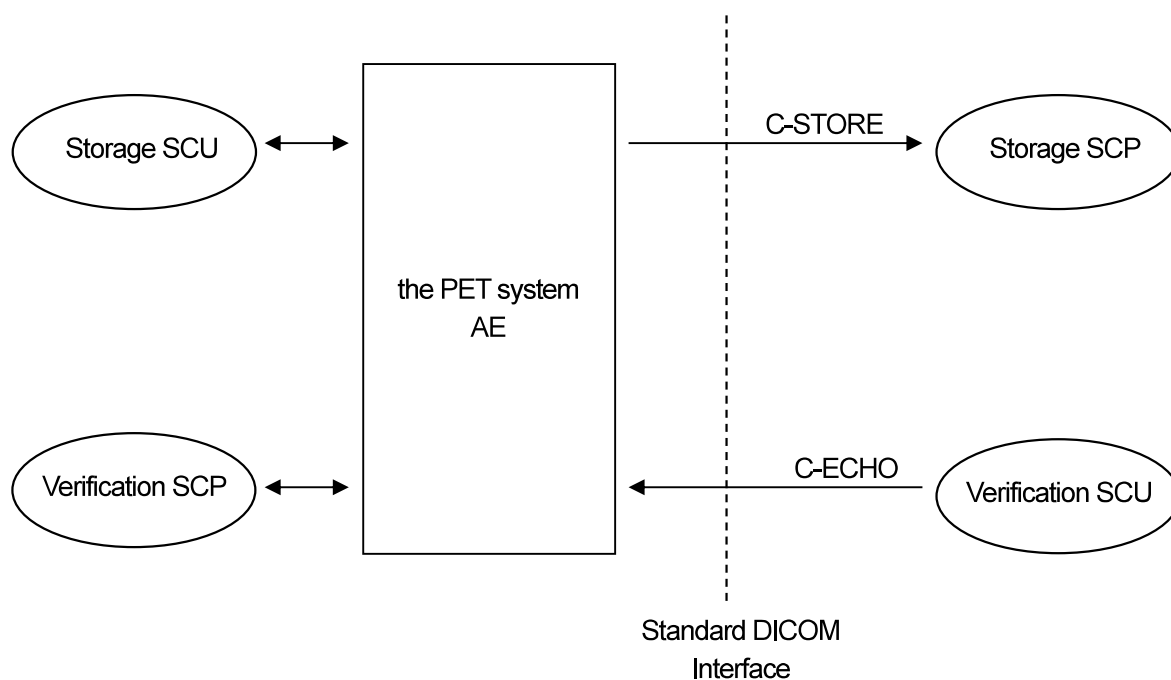
- NEMA: National Electrical Manufacturers Association
- OSI: Open Systems Interconnection
- PDU: Protocol Data Unit
- RWA: Real-World Activity
- SCP: Service Class Provider
- SCU: Service Class User
- SOP: Service-Object Pair
- TCP/IP: Transmission Control Protocol/Internet Protocol
- UID: Unique Identifier

0.4 References

- NEMA PS3 Digital Imaging and Communications in Medicine (DICOM) Standard, available free at <http://dicom.nema.org/http://dicom.nema.org/>

1. Implementation Model

1.1 Flowchart of Application Data



1.2 Definition of AE Functions

The PET system AEs support the following DICOM functionality.

- Send images as SCUs to remote host using DICOM storage service class.
- Check associations received as SCPs from remote host using DICOM verification service class.

1.3 Real-World Activity Sequence Control

The PET system AEs do not apply sequence control for real-world activities.

2. AE Specifications

2.1 Specifications

The PET system AEs supply the following DICOM version 3.0 SOP classes as SOP class SCUs.

SOP Class Name	SOP Class UID
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7

The PET system AEs supply the following DICOM version 3.0 SOP classes as SOP class SCPs.

SOP Class Name	SOP Class UID
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Verification	1.2.840.10008.1.1

2.1.1 Association Establishment Policy

The PET system AEs try to start or approve an association whenever valid parameters are received.

2.1.1.1 Overview

2.1.1.2 Number of Associations

Only one association is attempted per time.

2.1.1.3 Asynchronous Characteristics

Asynchronous processes are not supported.

2.1.1.4 Implementation Identifying Information

The implementation class UID for the PET system AEs is 1.2.392.200036.9110.

2.1.2 Starting Associations Based on Real-World Activities

The PET system AEs try to start an association for the following activities.

- Send image
- Send query or retrieval request

2.1.2.1 Sending Images

2.1.2.1.1 Related Real-World Activities

The PET system AEs send images based on user requests.

2.1.2.1.2 Presentation Context

Only the following presentation context is proposed. This presentation context uses the SOP class UID specified in the file header as the proposed abstract syntax and the transfer syntax specified in the file header as the proposed transfer syntax (in this case "DICOM implicit VR").

Presentation Context					
Abstract Syntax		Transfer Syntax		Function	Extended Negotiation
Name	UID	Name List	UID List		
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Implicit Little Endian	1.2.840.10008.1.2	SCU	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7				

2.1.2.1.2.1 SOP Class-Specific Conformance

If appropriate abstract or transfer syntax cannot be determined for a file, abstract or transfer syntaxes are not supported, or the image does not satisfy the IOD requirements for the SOP class, then the log event is displayed in standard output. Then the following file transfers are resumed.

2.1.3.1 Confirmation Responses

2.1.3.1.1 Related Real-World Activities

The PET system AEs send a confirmation in response to confirmation requests from the remote host.

2.1.3.1.2 Presentation Context

Only the following presentation context is proposed. This presentation context uses the SOP class UID specified in the file header as the proposed abstract syntax and the transfer syntax specified in the file header as the proposed transfer syntax (in this case "DICOM implicit VR").

Presentation Context					
Abstract Syntax		Transfer Syntax		Function	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit Little Endian	1.2.840.10008.1.2	SCP	None

2.1.3.1.3 Presentation Context Approval Criteria

The PET system AEs always approve presentation context that has default DICOM syntax for the verification SOP class UID.

3. Communication Profiles

3.1 Supported Communication Stacks (Parts 8 and 9)

The PET system supports DICOM version 3.0 TCP/IP network communications defined in Part 8 of DICOM standards.

3.2 OSI Stacks

Not supported.

3.3 TCP/IP Stacks

Retains TCP/IP stacks from Unix operating system.

3.3.1 API

Not applied.

3.3.2 Physical Media Support

This is independent of physical media supported by TCP/IP. Maintains support of physical media from the Unix operating system where TCP/IP runs.

3.4 Stacks Between Two Points

Not supported.

4. Extension, Specialization, and Personalization

Not applied.

5. Contents

The PET system obtains setting information from a settings file.

5.1 AE Title and Presentation Address Support

Local AEs

- Has the following standard value
Local AE title: SMZ_PT00

Remote AEs

- AE title, port number, and host name can be specified.

5.2 Settable Parameters

Settings can be specified (or changed) for the following parameters.

- Local AE title
- Local IP address
- Local IP netmask

6. Supported Character Set Extensions

No character set extensions are supported.