FUJIFILM

SonoSite
PDAS
Patient Data Archival Software

DICOM Conformance Statement
Product Software v1.0

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CONTENTS

Introduction

About this document

This document describes the SonoSite PDAS Application's conformance to the ACR-NEMA DICOM (Digital Imaging and Communications in Medicine) standard and satisfies the DICOM requirement for a vendor conformance specification.

PDAS is an ultrasound image storage system. The DICOM options of PDAS provide a means to receive, store, query, and retrieve ultrasound images.

This document is written with respect to ACR-NEMA DICOM version number 3.0 – 2007.

Conformance Statement Overview

The PDAS application implements the necessary DICOM services to receive, store, query, and retrieve images and reports transmitted from ultrasound systems.

Table 1–1 provides an overview of the network services supported by PDAS.

Table 1–1: Networking Services

Networking SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Ultrasound Image Storage	No	Yes
Ultrasound Multi-Frame Image Storage	No	Yes
Encapsulated CDA Storage	No	Yes
Basic Text SR Storage	No	Yes
Query/Retrieve		
Study Root Information Model FIND	No	Yes
Study Root Information Model MOVE	No	Yes
Patient Root Information Model FIND	No	Yes
Patient Root Information Model MOVE	No	Yes
General		
Verification	Yes	Yes

Table 1-2 provides an overview of the media storage services supported by PDAS.

Table 1-2: Media Storage Services

SOP Classes	Role
Media Storage Directory Storage	FSC
Ultrasound Image Storage	FSC
Ultrasound Multi-Frame Image Storage	FSC
Encapsulated CDA Storage	FSC
Basic Text SR Storage	FSC

DICOM Background

The DICOM information exchange specification provides a definitive structure of commands and information that allow for the inter-communication of medical imaging devices. Developed by the American College of Radiology (ACR) and the National Electrical Manufacturers Association (NEMA), the DICOM standard strives to promote communication of image information through the use of a standardized set of command classes and information semantics.

The DICOM standard defines classes of information that are common to many modalities of medical imaging. However, to meet the specific needs of information content for such a diverse range of information, the DICOM specification defines structures for a multitude of medical data. To alleviate the need for applications to implement every aspect of the DICOM specification, a list of conformance tables for every modality was created to define the minimum set of information necessary for data exchanges. A requirement of the DICOM specification is to maintain a compliance document that outlines a subset of DICOM services and data classes that are supported by a device. The purpose of this document is to define a subset of DICOM for the exchange of information with the SonoSite PDAS application via its DICOM features.

Definitions

AE	Application Entity
ANSI	American National Standards Institute
DICOM	Digital Imaging and Communications in Medicine
FSC	File Set Creator
FSR	File Set Reader
IOD	Information Object Definition
PDU	Protocol Data Unit
PPS	Performed Procedure Step
SCU	Service Class User (Client)
SCP	Service Class Provider (Server)
SOP	Service – Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
US	Ultrasound
VR	Value Representation

Reference documents

ACR-NEMA DICOM Standard Version 3.0 – 2007

CHAPTER 2

Implementation Model

The PDAS DICOM features incorporate the DICOM 3.0 standard for networked image storage functions. Performed Procedures[1] are transferred from an ultrasound system using standard network connections to be stored on PDAS.

Images may be stored into PDAS via network transfer. Once studies have been transferred to PDAS they may be reviewed, have reports created for them, and be accessed via Query/Retrieve.

[1] Performed Procedures consist of images and reports from the ultrasound system.

Application Data Flow Diagram

The diagram in Figure 2-1 represents the relationship between PDAS's real-world activities and the remote AE's built into the ultrasound systems that PDAS communicates with using DICOM.

Figure 2-1 Implementation Model
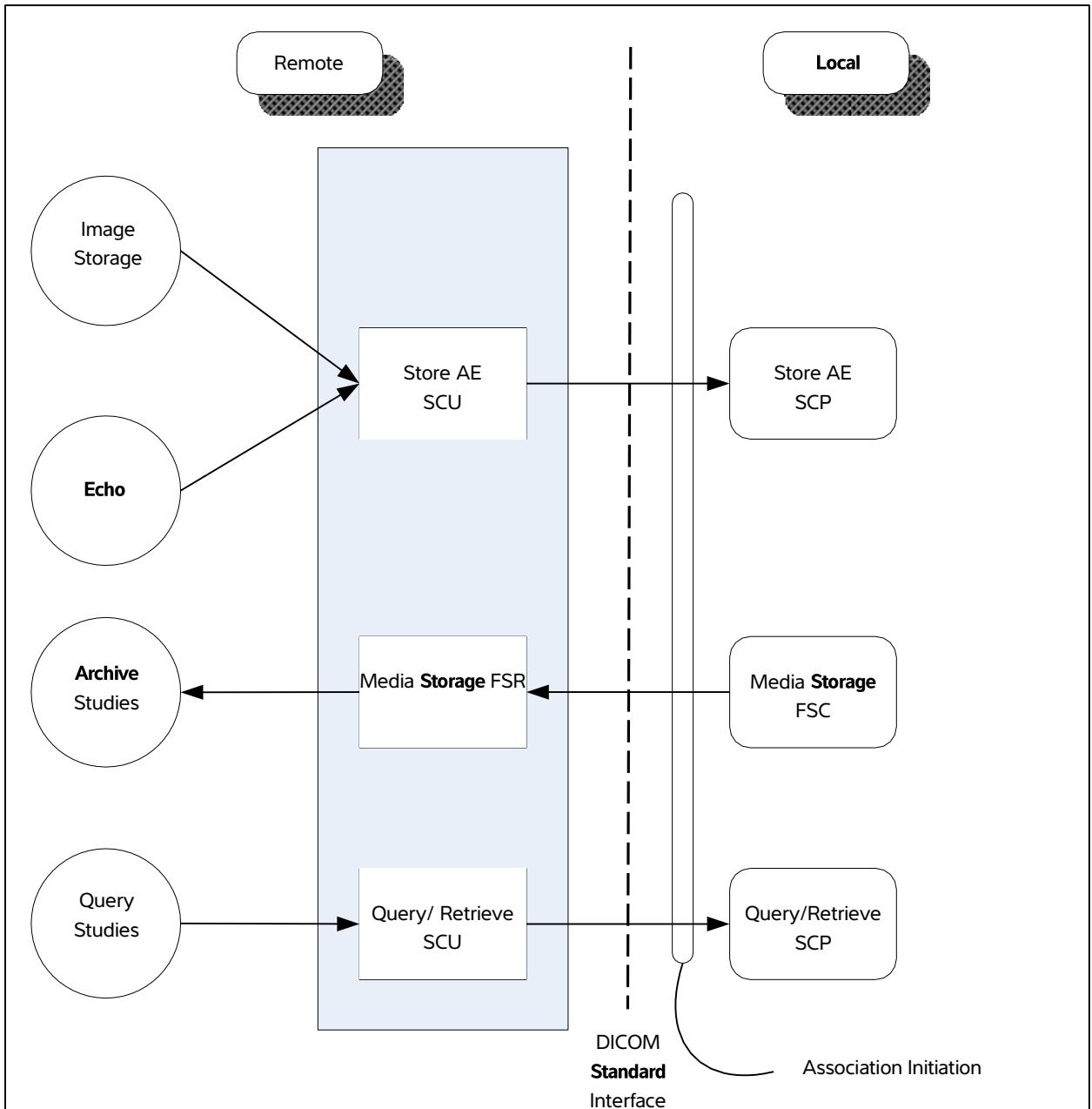
The following are the conditions that invoke real-world activities associated with AE's.

Image Storage

Ultrasound system transfers images via C-Store.

Echo

Ultrasound system initiates C-Echo.

Archive Studies

PDAS Administrator selects one or more studies to be archived via DICOMDIR.

Query Studies

Workstation user constructs query for one or more images that may be stored by PDAS via C-FIND, selected images are then transferred via C-MOVE.

Functional Definitions of AE's

Store

This AE handles receiving ultrasound images from an ultrasound system using the DICOM store SCP services.

Steps taken for Echo operation:

```
A-ASSOCIATE
C-ECHO command
A-RELEASE
```

Steps taken for image storage operation:

```
A-ASSOCIATE
for each exam image
{
        C-STORE Image SOP Instance
}
A-RELEASE
```

Steps taken for image query/retrieve operation:

```
A-ASSOCIATE
To find images of interest
{
        C-FIND
}
A-RELEASE
```

```
A-ASSOCIATE
To transfer images of interest
{
        C-MOVE
}
A-RELEASE
```

Sequencing of Real–World Activities

All real world activities that initiate communication to local AE′s operate asynchronously with respect to each other and Workflow activities.

Figure 2–2 PDAS Sequencing of Real-World Activities
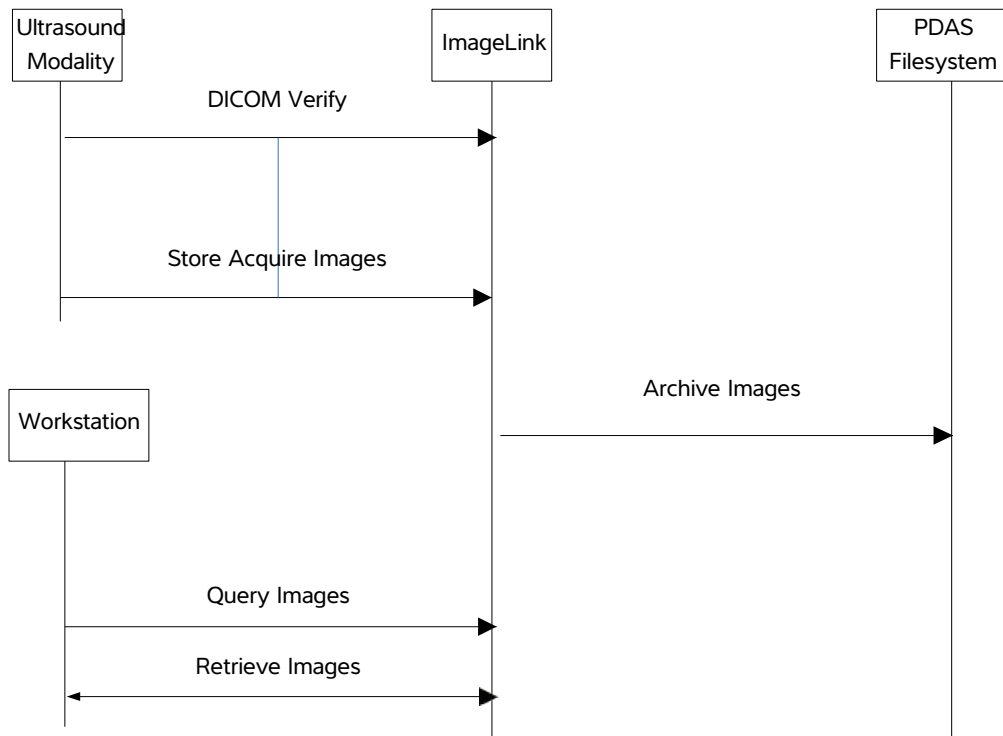
Under normal conditions the sequencing constraints illustrated apply:

1. DICOM Verify conducted to ensure proper system setup.
2. Images transferred from Ultrasound System.
3. Image Archive creates DICOMDIR on PDAS filesystem.

AE Specifications

Store AE Specification

The Store AE provides conformance to the following DICOM V3.0 SOP Classes as an SCP:

Table 3-1: Store AE SOP Class Support

SOP Class Name	SOP Class UID	Conformance Level
Verification	1.2.840.10008.1.1	Standard
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Standard
Ultrasound Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Standard
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	Standard
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Standard
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Standard
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Standard
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Standard
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Standard

Association Establishment Policies

The Store AE will accept an association from a device in response to the following real-world activities: Image Storage or Verify.

General

Maximum PDU size the Store AE can receive: 131,072 bytes

> This is the maximum PDU size the Store AE can receive and is the value offered for the maximum PDU size in the Association Request command. Once the Association is open, if the Store AE receives a PDU that is larger than this value then the Association will be aborted.

Maximum PDU size the Store AE can send: 1,048,576 bytes

This is the maximum PDU size the Store AE can be configured to send. The maximum PDU size sent on any Store AE Association will be the smaller of the configured value and the maximum PDU size received in the Association Accept response.

Number of Associations

Number of simultaneous associations for the Store AE:

There is no enforced limit. System configuration (CPU, memory, storage) contribute to practical limitations.

Asynchronous Nature

The Store AE does not use asynchronous operations.

Implementation Identifying Information

Implementation Class UID: "1.2.840.114340.05.0.0.1"

Implementation Version name: "FFSS_PDAS_001"

Note	"**114340**" is registered by SonoSite with ANSI. Version name will be used initially as shown, but is subject to change with new versions of the DICOM capable application software.

Association Initiation Policy

The Store AE does not initiate Associations.

Association Acceptance Policy

The Store AE will accept Associations from remote ultrasound systems based on the real world activities particular to that system.

External AE Requests Ultrasound Image Storage

The Image Storage real-world activity initiated by an ultrasound system will cause the Store AE to accept associations and respond accordingly.

External AE Requests Verification

The Echo command real-world activity initiated by an ultrasound system will cause the Store AE to accept associations and respond accordingly.

Accepted Presentation Contexts

Table 3-2: Store AE Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian Explicit VR Little Endian JPEG Baseline (Process 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50	SCP	None
Ultrasound Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Little Endian JPEG Baseline (Process 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50	SCP	None
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Patient Root Q/R-FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Study Root Q/R-FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Patient Root Q/R-MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		Explicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50		
Study Root Q/R-MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian If the image is stored compressed then JPEG Baseline (Process 1) transfer syntax will be negotiated. Otherwise Explicit VR Little Endian will be tried.	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50	SCP	None

Verification SOP Class

The Store AE provides standard conformance to the Verification SOP Class as an SCP.

Ultrasound Image Storage SOP Class

The Store AE provides standard conformance to the Ultrasound Image Storage SOP Class as an SCP.

Ultrasound Multi–Frame Image Storage SOP Class

The Store AE provides standard conformance to the Ultrasound Multi-Frame Image Storage SOP Class as an SCP.

Encapsulated CDA Storage SOP Class

The Store AE provides standard conformance to the Encapsulated CDA Storage SOP Class as an SCP.

Basic Text SR Storage SOP Class

The Store AE provides standard conformance to the Basic Text SR Storage SOP Class as an SCP.

Patient Root Query/Retrieve Information Model – FIND SOP Class

The Store AE provides standard conformance to the Patient Root Query/Retrieve Information Model – FIND as an SCP.

Study Root Query/Retrieve Information Model – FIND SOP Class

The Store AE provides standard conformance to the Study Root Query/Retrieve Information Model – FIND as an SCP.

Patient Root Query/Retrieve Information Model – MOVE SOP Class

The Store AE provides standard conformance to the Patient Root Query/Retrieve Information Model – MOVE as an SCP.

Study Root Query/Retrieve Information Model – MOVE SOP Class

The Store AE provides standard conformance to the Study Root Query/Retrieve Information Model – MOVE as an SCP.

Store AE Behavior to C–Store Status

Table 3–3 describes the behavior for C-Store response status returned from the Storage SCP. All SOP classes supported by the Store AE exhibit the same behavior.

Table 3–3: Store AE Behavior to C–Store Status

Service Status	Further Meaning	Status Codes	Store AE Behavior
Success		0000	The Composite SOP Instance was successfully received and stored in the system repository.
Failure	Refused: Out of Resources	A700	This status is returned if resources are unavailable to complete an operation that is not enumerated below. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – No DICOM storage directory available	A701	This status is returned if DICOM storage directory is unavailable. The appropriate Status will be sent in the C- STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – No root storage directory available	A702	This status is returned if root storage directory is unavailable. The appropriate Status will be sent in the C- STORE Response. Error indication message is output to the Service Log.

Table 3-3: Store AE Behavior to C-Store Status

Service Status	Further Meaning	Status Codes	Store AE Behavior
Failure	Refused: Out of Resources – No resource directory available	A704	This status is returned if the resource directory used for processing datasets is unavailable. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – No filename available	A708	This status is returned if a filename for storage cannot be created. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – Out of memory	A710	This status is returned if memory cannot be allocated by the operating system. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – Cannot get database lock	A720	This status is returned if the request to lock the database fails. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – Image size too large	A730	This status is returned if there is not enough memory to create the transformed image. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – Cannot add database record	A740	This status is returned if the index record cannot be added to the database. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – No database handle	A750	This status is returned if the handle to the database does not exist. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – Cannot write DICOM file	A760	This status is returned if the DICOM file cannot be written to the filesystem The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.

Table 3-3: Store AE Behavior to C-Store Status

Service Status	Further Meaning	Status Codes	Store AE Behavior
Failure	Refused: Out of Resources – Multimedia output directory is invalid	A770	This status is returned if the created multimedia output directory is invalid. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – Cannot load resourced	A780	This status is returned if the resources necessary to process a dataset into multimedia format are unavailable. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Error: Data Set does not match SOP class	A900	This status is returned if the C-STORE Request specifies Attributes that are not specific as part of the Storage SOP class. The appropriate SUCCESS Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Error: Cannot Understand	C000	This status is returned a failure is detected while processing DICOM the dataset. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Error: Cannot Understand – Cannot load file	C010	This status is returned if the DICOM file cannot be loaded during database operations. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.
	Error: Cannot Understand – Unsupported character set	C011	This status is returned if the DICOM dataset contains an unsupported character set. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.

Table 3-3: Store AE Behavior to C-Store Status

Service Status	Further Meaning	Status Codes	Store AE Behavior
Warning	Coercion of data elements	B000	This status is returned if one or more Attribute values were coerced/ modified on reception. Image transmission is considered successful. The appropriate SUCCESS Status will be sent in the C-STORE Response. Warning indication message is output to the Service Log.

Store AE Behavior to C-Find Status

Table 3-4 describes the behavior for C-Find response status returned from the Storage SCP. All Query SOP classes supported by the Store AE exhibit the same behavior.

Table 3-4: Store AE Behavior to C-Find Status

Service Status	Further Meaning	Status Codes	Store AE Behavior
Success		0000	Matching is complete. No final identifier is supplied.
Pending		FF00	Matches are continuing.
Failure	Refused: Out of Resources	A710	This status is returned if memory cannot be allocated by the operating system. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – No database handle	A750	This status is returned if the handle to the database does not exist. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – Cannot get shared database lock	A770	This status is returned if the request to lock the database fails. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
Failure	Refused: Out of Resources – Can't make DICOM element	A780	This status is returned if there are issues creating a tag of the requested response dataset. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.

Table 3-4: Store AE Behavior to C-Find Status

Service Status	Further Meaning	Status Codes	Store AE Behavior
Failure	Refused: SOP class not supported	A800	This status is returned if the C-FIND Request specifies a SOP class UID that is not supported. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
	Error: Data Set does not match SOP class	A900	This status is returned if the C-FIND Request specifies Attributes that are not specific as part of the C_FIND SOP class or necessary ones are missing. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
	Failure: Unable to Process	C000	This status is returned when a failure is detected while processing the query parameters for a match in the database. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
	Failure: Unable to Process – Invalid Search Root	C010	This status is returned if the DICOM file cannot be loaded during database operations. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
	Failure: Unable to Process – Matching Function Failure	C011	This status is returned when a failure is detected while processing the query parameters for a match in the database. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
	Failure: Unable to Process – Cannot put string result into requested element	C012	This status is returned when a failure is detected while trying to load a return string value into a requested element of the return dataset. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.

Table 3-4: Store AE Behavior to C-Find Status

Service Status	Further Meaning	Status Codes	Store AE Behavior
	Failure: Unable to Process – Cannot put result into requested element	C014	This status is returned when a failure is detected while trying to load a return value into a requested non-string element of the return dataset. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.

Store AE Behavior to C-Move Status

Table 3-5 describes the behavior for C-Move response status returned from the Storage SCP. All Move SOP classes supported by the Store AE exhibit the same behavior.

Table 3-5: Store AE Behavior to C-Move Status

Service Status	Further Meaning	Status Codes	Store AE Behavior
Success		0000	Sub-operations complete – No failures.
Pending		FF00	Sub-operations are continuing.
Cancel		FE00	Sub-operations terminated due to Cancel Indication.
Warning		B000	Sub-operations Complete - One or more Failures.
Failure	Refused: Out of Resources – Unable to calculate number of matches	A701	The appropriate Status will be sent in the C-MOVE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – Unable to perform sub-operations	A702	The appropriate Status will be sent in the C-MOVE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – No database handle	A750	This status is returned if the handle to the database does not exist. The appropriate Status will be sent in the C-MOVE Response. Error indication message is output to the Service Log.

Table 3-5: Store AE Behavior to C-Move Status

Service Status	Further Meaning	Status Codes	Store AE Behavior
Failure	Refused: Out of Resources – Out of Memory	A760	This status is returned if there is not enough system memory to complete the operation. The appropriate Status will be sent in the C- MOVE Response. Error indication message is output to the Service Log.
	Refused: Out of Resources – Cannot get shared database lock	A770	This status is returned if the request to lock the database fails. The appropriate Status will be sent in the C- MOVE Response. Error indication message is output to the Service Log.
	Refused: Move Destination unknown	A801	The appropriate Status will be sent in the C- MOVE Response. Error indication message is output to the Service Log.
	Error: Identifier does not match SOP class	A900	The appropriate Status will be sent in the C- MOVE Response. Error indication message is output to the Service Log.
	Failure: Unable to Process – Invalid Search Root	C010	This status is returned if the search root specified is not known. The appropriate Status will be sent in the C- MOVE Response. Error indication message is output to the Service Log.
	Failure: Unable to Process – Matching Function Failure	C011	This status is returned when a failure is detected while processing the query parameters for a match in the database. The appropriate Status will be sent in the C- MOVE Response. Error indication message is output to the Service Log.
	Failure: Unable to Process – Out of Memory	C900	This status is returned if there is not enough system memory to generate the move request. The appropriate Status will be sent in the C- MOVE Response. Error indication message is output to the Service Log.
	Failure: Unable to Process – Cannot read index record	CA00	This status is returned when a failure is detected while trying to read the database for informational content. The appropriate Status will be sent in the C- MOVE Response. Error indication message is output to the Service Log.

Query/Retrieve Information Model Attribute Support

Table 3-6 lists the support for attributes used in the Patient Root Query/Retrieve Information Model and Study Root Query/Retrieve Information Model.

Matching attributes may belong to one of the following types: Unique (U), Required (R), or Optional (O).

Table 3-6: Store AE Behavior to C-Find Status

Attribute Name	Tag	Patient	Study	Series	Instance	Study	Series	Instance
SOP Instance UID	(0008,0018)				U			U
Study Date	(0008,0020)		R			R		
Study Time	(0008,0030)		R			R		
Accession Number	(0008,0050)		R			R		
Modality	(0008,0060)			R			R	
Referring Physician's Name	(0008,0090)		O			O		
Study Description	(0008,0090)		O			O		
Name of Physician(s) Reading Study	(0008,1060)		O			O		
Admitting Diagnoses Description	(0008,1080)		O			O		
Patient Name	(0010,0010)	R				R		
Patient ID	(0010,0020)	U				R		
Patient Birth Date	(0010,0030)	O				O		
Patient's Birth Time	(0010,0032)	O				O		
Patient's Sex	(0010,0040)	O				O		

Table 3-6: Store AE Behavior to C-Find Status

| | | Root Level | Patient | | | Study | | |
| | | Query Level | | | | | | |
Attribute Name	Tag	Patient	Study	Series	Instance	Study	Series	Instance
Other Patient Id's	(0010,1000)	O				O		
Other Patient Names	(0010,1001)	O				O		
Patient's Age	(0010,1010)		O					
Patient's Size	(0010,1020)		O					
Patient's Weight	(0010,1030)		O					
Ethnic Group	(0010,2160)	O				O		
Occupation	(0010,2180)		O					
Additional Patient History	(0010,21B0)		O					
Patient Comments	(0010,4000)	O				O		
Study ID	(0020,0010)		R			R		
Series Number	(0020,0011)			R			R	
Instance Number	(0020,0013)				R			R
Study Instance UID	(0020,000D)		U			U		
Series Instance UID	(0020,000E)			U			U	
Other Study Numbers	(0020,1070)		O					
Number of Patient Related Studies	(0020,1200)	O				O		
Number of Patient Related Series	(0020,1202)	O				O		
Number of Patient Related Instances	(0020,1204)	O				O		

Table 3-6: Store AE Behavior to C-Find Status

Attribute Name	Tag	Patient	Study	Series	Instance	Study	Series	Instance
	Root Level		Patient				Study	
	Query Level	Patient	Study	Series	Instance	Study	Series	Instance
Number of Study Related Series	(0020,1206)	O					O	
Number of Study Related Instances	(0020,1208)	O					O	

Media Export AE – Specification

Introduction

This section of the conformance statement specifies the PDAS compliance to DICOM Media Storage. It details the roles supported by this product.

PDAS is able to export DICOM images to a specified file location.

Implementation Model

The Media Export AE saves Ultrasound images to a specified file location. It is associated with the local real-world activity "Archive Studies". "Archive Studies" is performed upon administrator request for selected patient studies.

Application Data Flow

Figure 3-1 Media Data Export Data Flow

Functional Definition of the AE

PDAS can perform the following functions:

❖ Create a new DICOM file-set

Sequencing of Real–World Activities

Not applicable.

File Meta Information Options (see PS 3.10)

The implementation information written to the File Meta Header in each file is:

Implementation Class UID: "1.2.840.114340.05.0.0.1"

Implementation Version name: "FFSS_PDAS_001"

| Note | "114340" is registered by SonoSite with ANSI. Version name will be used initially as shown, but is subject to change with new versions of the DICOM capable application software. |

Real–World Activities

Real–World Activities – "Archive Studies"

"Archive Studies" saves the selected studies to the selected file path and creates a DICOM File Set. A new, datestamped folder will be created by PDAS each time an archive operation is initiated, so there will never be any overwriting or updating of a preexisting dataset. The Media Export AE acts as a File Set Creator when requested to export SOP instances from internal storage.

Limitations: The user cannot review or manipulate DICOM files written to the USB medium on the system.

Media Storage Application Profile for the real–world activity "Archive Studies"

Not applicable [FUTURE]

Options

This Application Entity supports the SOP Classes and Transfer Syntaxes listed below in Table 3-7:

Table 3-7: SOP Classes and Transfer Syntaxes for Media Export

Abstract Syntax		Transfer Syntax	
Name	**UID**	**Name List**	**UID List**
Media Storage Directory Storage	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian JPEG Baseline (Process 1)	1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50

Table 3-7: SOP Classes and Transfer Syntaxes for Media Export

Abstract Syntax		Transfer Syntax	
Name	UID	Name List	UID List
Ultrasound Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian JPEG Baseline (Process 1)	1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian	1.2.840.10008.1.2.1

Common Composite Image IOD Module describes image module usage by PDAS.

Augmented and Private Application Profiles

Not applicable.

Media Configuration

The Application Entity Titles configurable for Media Services are listed below:

- ❖ Application Entity: "Media Export"

Media Storage SOP Class

The following diagram illustrates the relationship between directory entities in the Basic Directory module produced by PDAS. It is based on the basic DICOM entity relationship model.

Figure 3-2 PDAS Directory Entity Relationship Diagram
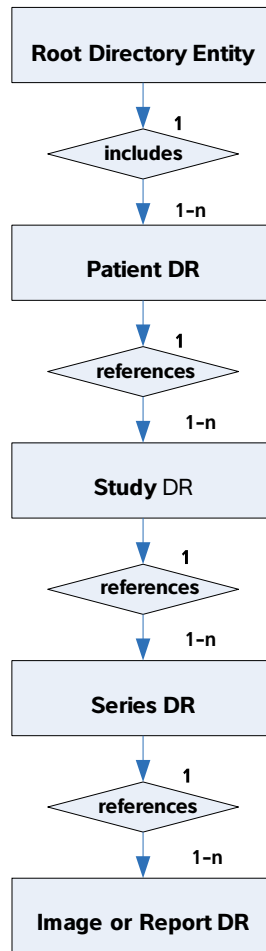
The Media Storage SOP Class uses the Basic Directory IOD Modules as shown in Table 3-8.

Table 3-8: Basic Directory IOD Modules

Module	Reference	Usage
File-set Identification	3.2.7.1	M
Directory Information	3.2.7.2	U

Information Module Definitions

File-Set Identification Module

Table 3-9 specifies the attributes used from the File-set Identification Module.

Table 3-9: File-Set Identification Module

Attribute Name	Tag	Type	Attribute Description
File-set ID	(0004,1130)	2	"FFSS_EXPORT"
File-set Descriptor ID	(0004,1141)	3	Not Used
Specific Character Set of File- set Descriptor File	(0004,1142)	1C	Not Used

Directory Information Module

Table 3-10 specifies the attributes used from the Directory Information Module.

Attribute Name	Tag	Type	Attribute Description
Offset of the First Directory Record of the Root Directory Entity	(0004,1200)	1	See PS 3.3
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	1	See PS 3.3
File-set Consistency Flag	(0004,1212)	1	See PS 3.3
Directory Record Sequence	(0004,1220)	2	See PS 3.3
>Offset of the Next Directory Record	(0004,1400)	1C	See PS 3.3
>Record In-use Flag	(0004,1410)	1C	See PS 3.3
>Offset of Referenced Lower- Level Directory Entity	(0004,1420)	1C	See PS 3.3
>Directory Record Type	(0004,1430)	1C	PDAS Supported Values: PATIENT, STUDY, SERIES, IMAGE, REPORT
>Referenced File ID	(0004,1500)	1C	See PS 3.3
>Referenced SOP Class UID in File	(0004,1510)	1C	See PS 3.3
>Referenced SOP Instance UID in File	(0004,1511)	1C	See PS 3.3
>Referenced Transfer Syntax in UID in File	(0004,1512)	1C	See PS 3.3

Patient Keys

Table 3-11 specifies the additional keys used for directory records of type PATIENT.

Table 3-11: Patient Keys

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	See PS 3.3
Patient ID	(0010,0020)	1	See PS 3.3
Patient's Birth Date	(0010,0030)	3	See PS 3.3
Patient's Sex	(0010,0040)	3	See PS 3.3

Study Keys

Table 3-12 specifies the additional keys used for directory records of type STUDY.

Table 3-12: Study Keys

Attribute Name	Tag	Type	Attribute Description
Study Date	(0008,0020)	1	See PS 3.3
Study Time	(0008,0030)	1	See PS 3.3
Study Description	(0008,1030)	2	See PS 3.3
Study Instance UID	(0020,000D)	1C	See PS 3.3
Study ID	(0020,0010)	1	See PS 3.3
Accession Number	(0008,0050)	2	See PS 3.3

Series Keys

Table 3-13 specifies the additional keys used for directory records of type SERIES.

Table 3-13: Series Keys

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	See PS 3.3
Institution Name	(0008,0080)	3	See PS 3.3
Series Instance UID	(0020,000E)	1	See PS 3.3
Series Number	(0020,0011)	1	See PS 3.3

Image Keys

Table 3-14 specifies the additional keys used for directory records of type IMAGE.

Table 3-14: Image Keys

Attribute Name	Tag	Type	Attribute Description
Image Type	(0008,0008)	3	See PS 3.3
Instance Number	(0020,0013)	1	See PS 3.3
Rows	(0028,0010)	3	See PS 3.3
Columns	(0028,0011)	3	See PS 3.3
Lossy Image Compression Ratio	(0028,2112)	3	See PS 3.3

Communication Profiles

TCP/IP Stack

The TCP/IP protocol is used.

CHAPTER 4

CHAPTER 5

Extensions/Specializations/Privatizations

Private Transfer Syntaxes

None

Chapter 5: Extensions/Specializations/Privatizations

Configuration

AE Title

The PDAS AE Title and networking parameters are configurable in the network setting page. Port number 104 is the default used for DICOM communication.

Configurable Parameters

PDAS Configurable Parameters

These parameters are intended to be configured by a network/DICOM administrator.

▸ DICOM AE Title (default = SSPDASSCP)
▸ Port (default = 104)

Other Configurable Parameters

These settings apply independent of network configuration:

❖ Archive directory (location on the server where DICOMDIR will be created)

Support of Extended Character Sets

The PDAS system supports the ISO-IR 100 and ISO-IR 192 character sets.

CHAPTER 7

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