



Penrad Technologies, Inc.

---

DICOM Conformance Statement for PenFetch

10580 Wayzata Blvd. Suite 200  
Minnetonka, MN 55305  
[www.penrad.com](http://www.penrad.com)

1	Introduction.....	3
1.1	Scope and Field of Application .....	3
1.2	Acronyms.....	3
2	Implementation Model .....	4
2.1	Application Data Flow Diagram .....	4
2.2	Functional Definitions of Application Entities .....	5
2.3	Sequencing of Real-World Activities.....	5
3	AE Specifications.....	5
3.1	AE Specifications for PenFetch .....	5
3.1.1	Association Establishment Policies .....	6
3.1.1.1	General .....	6
3.1.1.2	Number of Associations .....	6
3.1.1.3	Implementation Identifying Information.....	6
3.1.2	Association Initiation Policy .....	6
3.1.2.1	Move Studies to a Remote System.....	6
3.1.2.1.1	Associated Real World Activity.....	6
3.1.2.1.2	Accepted Presentation Contexts .....	6
3.1.2.2	Retrieve a Modality Worklist from a Remote System .....	7
3.1.2.2.1	Associated Real World Activity.....	7
3.1.2.2.2	Accepted Presentation Contexts .....	7
3.1.2.2.3	SOP Specific Conformance for SOP Class Storage .....	7
3.1.2.3	Query Study/Series from a Remote System.....	7
3.1.2.3.1	Associated Real World Activity.....	7
3.1.2.3.2	Accepted Presentation Contexts .....	8
3.1.2.3.3	SOP Specific Conformance for Query SOP Classes .....	8
4	Communication Profiles.....	8
4.1	Supported Communication Stacks .....	8
4.2	TCP/IP Stack.....	8
4.2.1	Physical Media Supported.....	9
5	Extensions/Specialization/Privatizations.....	9
6	Configuration .....	9

# 1 Introduction

## 1.1 Scope and Field of Application

To provide Dicom pre-fetch capabilities for view stations.

## 1.2 Acronyms

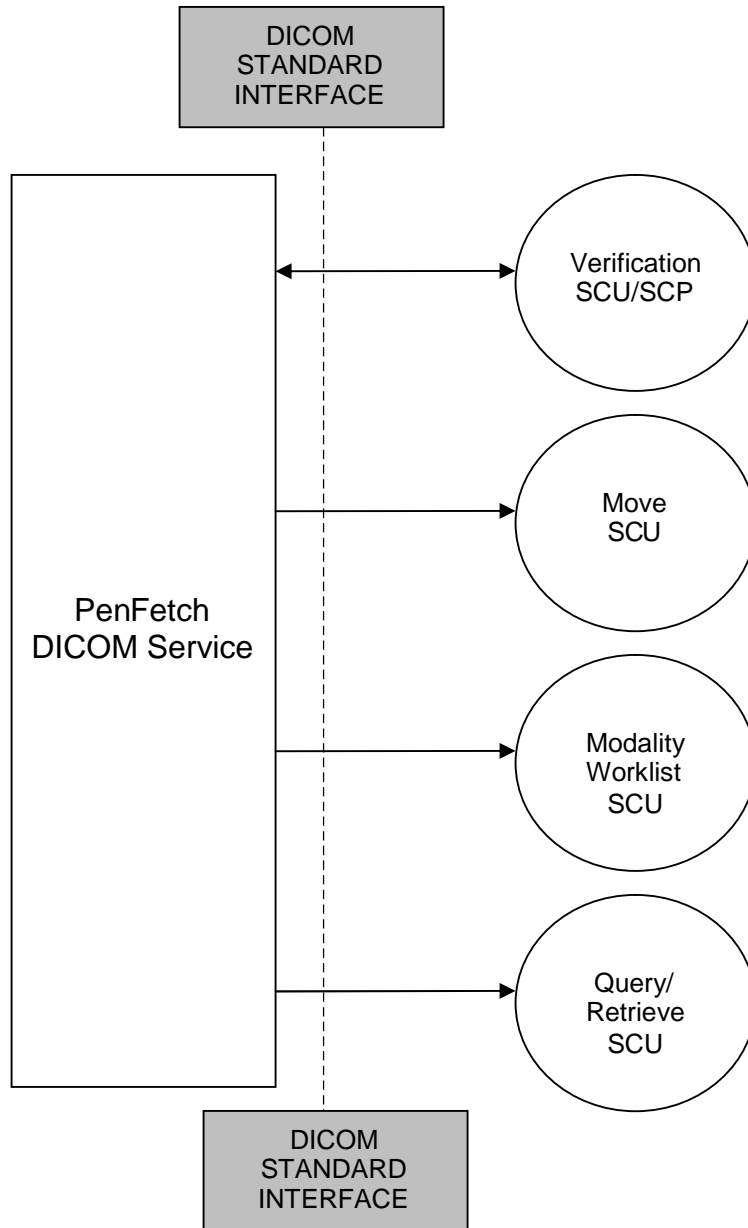
The following acronyms and abbreviations are used in this document.

<b>AE</b>	Application Entity
<b>ACR</b>	American College of Radiology
<b>ANSI</b>	American National Standards Institute
<b>DICOM</b>	Digital Imaging and Communications in Medicine
<b>GUI</b>	Graphical User Interface
<b>HIS</b>	Hospital Information System
<b>IOD</b>	Information Object Definition
<b>NEMA</b>	National Electrical Manufacturers Association
<b>PACS</b>	Picture Archiving and Communications System
<b>PDU</b>	Protocol Data Unit
<b>RIS</b>	Radiological Information System
<b>SCP</b>	Service Class Provider
<b>SCU</b>	Service Class User
<b>SOP</b>	Service Object Pair
<b>TCP/IP</b>	Transmission Control Protocol/Internet Protocol
<b>UID</b>	Unique Identifier
<b>VR</b>	Value Representation

Furthermore, all symbols, abbreviations, and definitions used herein are described in the Digital Imaging and Communications in Medicine (DICOM) standard, parts 1 through 13 (NEMA PS3.1-13).

## 2 Implementation Model

### 2.1 Application Data Flow Diagram



## 2.2 Functional Definitions of Application Entities

The PenFetch system supports Verification Services as a SCP. The DICOM Service Class User may request a C-ECHO operation to verify communications with the SCP.

The PenFetch system acts as a SCU for Verification, Move, Modality Worklist, and Query/Retrieve SOP classes.

## 2.3 Sequencing of Real-World Activities

No sequencing of Real World activities is required. An association is opened at the beginning of each activity and the association is ended when the activity is completed.

# 3 AE Specifications

## 3.1 AE Specifications for PenFetch

The PenFetch system Application Entity provides Standard Conformance to the following DICOM v3.0 SOP Class as a SCP:

SOP Classes as SCP	
SOP Class UID	SOP Class Name
Verification	
1.2.840.10008.1.1	Verification

The PenFetch system Application Entity provides Standard Conformance to the following DICOM v3.0 SOP Class as a SCU:

SOP Classes as SCU	
SOP Class UID	SOP Class Name
Verification	
1.2.840.10008.1.1	Verification
Move	
1.2.840.10008.5.1.4.1.2.2.2	Study Root Move
Modality Worklist Management	
1.2.840.10008.5.1.4.31	Modality Worklist Information Model
Query	
1.2.840.10008.5.1.4.1.2.1.1	Patient Root Query

### 3.1.1 Association Establishment Policies

#### 3.1.1.1 General

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

Maximum PDU size offered	Unlimited
Maximum PDU size accepted	Unlimited

#### 3.1.1.2 Number of Associations

Not configurable

#### 3.1.1.3 Implementation Identifying Information

Implementation UID	TBD
Implementation Version Name	PenFetch

### 3.1.2 Association Initiation Policy

#### 3.1.2.1 Move Studies to a Remote System

##### 3.1.2.1.1 Associated Real World Activity

The PenFetch system can be configured to move studies to any number of remote systems. PenFetch will search for studies a view station will need for display. PenFetch will issue a C-Move to a PACS on selected studies for each remote system(s) configured.

##### 3.1.2.1.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Study Root Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

### 3.1.2.2 Retrieve a Modality Worklist from a Remote System

#### 3.1.2.2.1 Associated Real World Activity

The PenFetch system will query a remote device(s) for a Modality Worklist to determine which patients need prior studies moved to the view station(s). The PenFetch system has two uses for the worklist. First, will populate the view stations with x number of prior studies. The other is looking for current studies added during the day.

#### 3.1.2.2.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Modality Worklist Query	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

#### 3.1.2.2.3 SOP Specific Conformance for SOP Class Storage

The fields below are always included in the query request to ask the SCP to return them for each response.

Modality Worklist Query		
Module	Description	Tag
Scheduled Procedure Step	Schedule Procedure Step Sequence	(0040,0100)
	> Schedule Procedure Step Start Time	(0040,0002)
	> Schedule Procedure Step Stop Time	(0040,0003)
	> Modality	(0008,0060)
Patient Identification	Patient's Name	(0010,0010)
	Patient ID	(0010,0020)
	Other Patient ID's	(0010,1040)
Patient Demographics	Patient Birth Date	(0010,0030)
	Patient Sex	(0010,0040)
Imaging Service Request	Referring Physicians Name	(0008,0090)
Requested Procedure	Requesting Physician	(0032,1032)

### 3.1.2.3 Query Study/Series from a Remote System

#### 3.1.2.3.1 Associated Real World Activity

The PenFetch system will query a remote device(s) for Study and/or Series information. After querying a Modality Worklist, PenFetch determines which studies to Move to remote destinations. It will query the Study level using Patient ID and a Date range for Study Date. PenFetch may query the Series Level using Patient ID and Study Instance UID.

### 3.1.2.3.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Patient Root Query	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

### 3.1.2.3.3 SOP Specific Conformance for Query SOP Classes

Fields retrieved are listed in the tables below.

Patient Root Query		
Study Level		
Module	Description	Tag
Patient Identification	Patient ID	(0010,0020)
General Study	Study Date	(0008,0020)
	Study Time	(0008,0030)
	Accession Number	(0008,0050)
	Modalities In Study	(0008,0061)
	Study Description	(0008,1030)
	Study Instance UID	(0020,000D)

Patient Root Query		
Series Level		
Module	Description	Tag
Patient Identification	Patient ID	(0010,0020)
General Study	Study Instance UID	(0020,000D)
General Series	Modality	(0008,0060)
	Body Part Examined	(0018,0015)
	Series Instance UID	(0020,000E)

## 4 Communication Profiles

### 4.1 Supported Communication Stacks

The PenFetch system provides DICOM v3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard

### 4.2 TCP/IP Stack

The PenFetch system utilizes the TCP/IP stack from the Microsoft Windows platform.



#### **4.2.1 Physical Media Supported**

The PenFetch system is independent of the physical medium over which TCP/IP executes. Any device listed in the Microsoft Windows Hardware compatibility list may be used

### **5 Extensions/Specialization/Privatizations**

Not applicable.

### **6 Configuration**

The PenFetch system utilizes XML configuration files for the setting of all configurable settings.