GE Healthcare

Technical Publications

Direction 5492818-1EN
Revision 1

AW Pioneer 1.0

CONFORMANCE STATEMENT for DICOM

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REVISION HISTORY

ENGINEERING REVISION HISTORY

Engineering revisions and master for this document are archived in the MyWorkshop system under DOC1444037

Revision	Version	Date	Author	Description of content changed	Reason for change/change control number
1	1	09/12/2010	Clive Li	Initial version of the document	
1	2	10/22/2013	Yun LUO	Fixed 1st found review comments from Herve Hoehn	
1	3	11/14/2013	Yun LUO	Fixed 2nd found review comments from Herve Hoehn	
1	4	11/18/2013	Clive Li	Fix found comments from Herve Hoehn	
1	5	11/21/2013	Clive Li	Fix 4th review found comments from Herve Hoehn	

TECHNICAL PUBLICATION REVISION HISTORY

M3 release of this document is referenced in the Part Data Management (PDM) system and archived in the Common Document Library as Direction **5492818-1EN**

Revision	Date	Reason for change

CONFORMANCE STATEMENT OVERVIEW

AW Pioneer 1.0 is a DICOM platform supporting in its database and in networking the most used DICOM IODs. It uses as well some DICOM printing services. The DICOM media is not supported.

Table 0.1 provides an overview of the network services supported by AW Pioneer 1.0.

Table 0.1 – NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Computed Radiography Image Storage	Yes	Yes
Digital X-Ray Image Storage – For Presentation	Yes	Yes
Digital X-Ray Image Storage – For Processing	Yes	Yes
Digital Mammography X-Ray Image Storage – For Presentation	Yes	Yes
Digital Mammography X-Ray Image Storage – For Processing	Yes	Yes
CT Image Storage	Yes	Yes
Ultrasound Multi-frame Image Storage	Yes	Yes
MR Image Storage	Yes	Yes
Ultrasound Image Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
X-Ray Angiographic Image Storage	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	Yes	Yes
Nuclear Medicine Image Storage	Yes	Yes
Spatial Registration Storage	Yes	Yes
Basic Text SR	Yes	Yes
Enhanced SR	Yes	Yes
Comprehensive SR	Yes	Yes
Key Object Selection Document	Yes	Yes
Positron Emission Tomography Image Storage	Yes	Yes
Standalone PET Curve Storage	Yes	Yes
RT Image Storage	Yes	Yes
RT Structure Set Storage	Yes	Yes
RT Plan Storage	Yes	Yes
Query/Retrieve		
Study Root Query/Retrieve Information Model – FIND	Yes	Yes
Study Root Query/Retrieve Information Model – MOVE	Yes	Yes
Print Management		
Basic Film Session SOP Class	Yes	No
Basic Film Box SOP Class	Yes	No
Basic Grayscale Image Box SOP Class	Yes	No
Basic Color Image Box SOP Class	Yes	No

Basic Grayscale Print Management Meta SOP Class	Yes	No
Basic Color Print Management Meta SOP Class	Yes	No
Printer SOP Class	Yes	No
Workflow Management		
Storage Commitment Push Model SOP Class	Yes	No

Table 0.2 provides an overview of the Media Storage Application Profiles supported by AW Pioneer.

Table 0.2 - MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk – Recordable		
General Purpose CD-R	FSC	Yes
DVD		
General Purpose JPEG DVD	FSC	Yes
USB		
General Purpose JPEG USB	FSC	Yes

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TABLE OF CONTENTS

1. INTRODUCTION

1.1 OVERVIEW

This DICOM Conformance Statement is divided into Sections as described below:

Section 1 (Introduction) describes the overall structure, intent, and references for this Conformance Statement

Section 2 (Network Conformance Statement) specifies the GEHC equipment compliance to the DICOM requirements for the implementation of networking features.

Section 3 (Media Storage Conformance Statement), which specifies the GEHC equipment compliance to the DICOM requirements for the implementation of Media Storage features.

Section 4 (Storage Commitment Push Model Implementation), which specifies the GEHC equipment compliance to DICOM requirements for the implementation of the Storage Commitment service.

Section 5 (SECONDARY CAPTURE Information Object Implementation) specifies the GEHC equipment compliance to the DICOM requirements of SC Information Object produced by this implementation.

Section 6 (Enhanced Structured Report Information Object Implementation) specifies the GEHC equipment compliance to the DICOM requirements of Enhanced SR Information Object produced by this implementation.

Section 7 (Key Object Selection Document Information Object Implementation) specifies the GEHC equipment compliance to the DICOM requirements of Key Object Selection produced by this implementation.

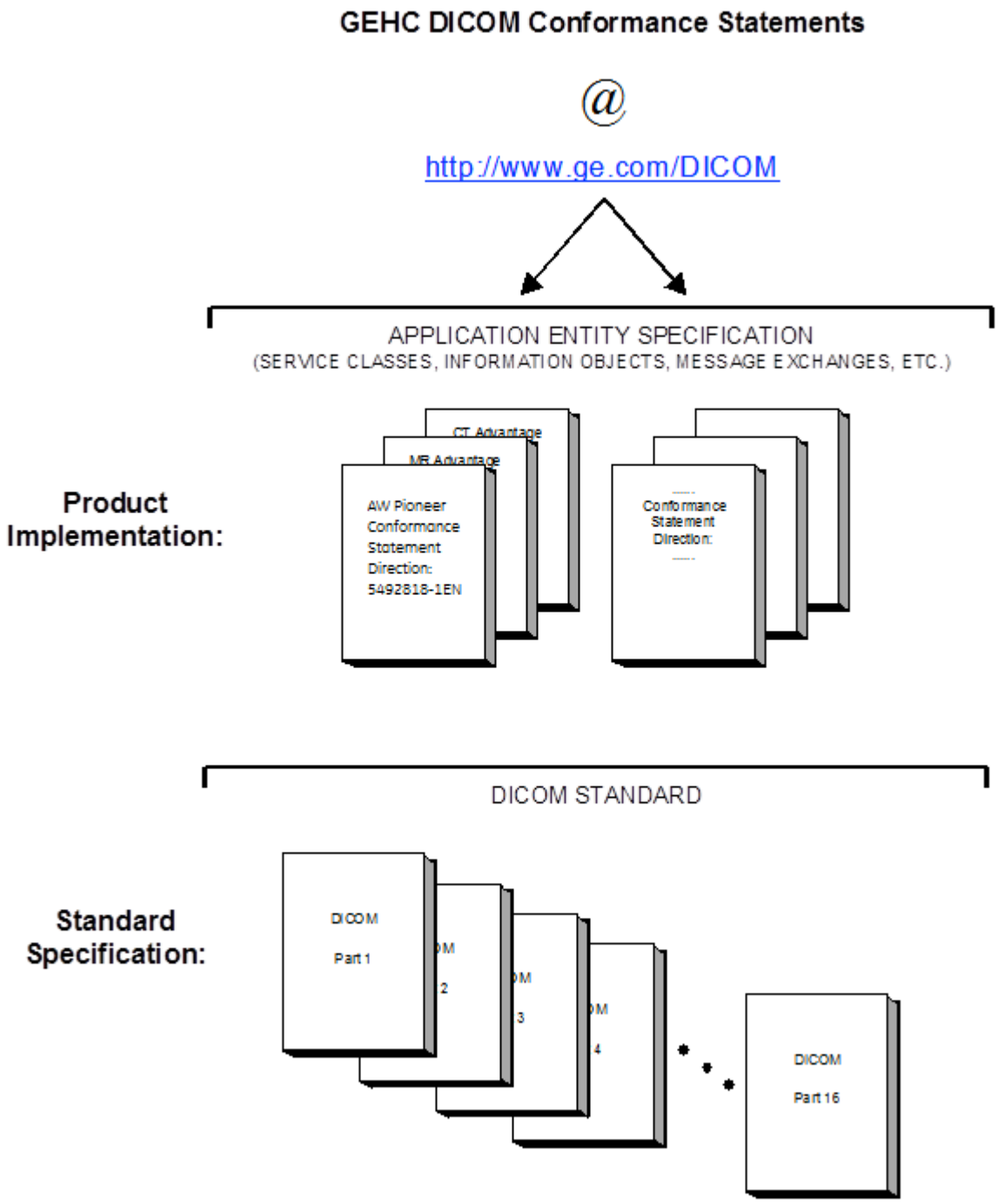
Section 8 (X-Ray Angiographic Information Object Implementation) specifies the GEHC equipment compliance to the DICOM requirements for the implementation of XA Image Information Object Implementation feature.

Section 9 (Basic Directory Information Object Implementation), which specifies the GEHC equipment compliance to DICOM requirements for the implementation of the Basic Directory storage service.

Section 10 (Print Management SOP Class definition) specifies the GEHC equipment compliance to the DICOM requirements for the implementation of Network Print Management SOP Class.

1.2 OVERALL DICOM CONFORMANCE STATEMENT DOCUMENT STRUCTURE

The Documentation Structure of the GEHC DICOM Conformance Statements is shown in the Illustration below.



This document specifies the DICOM implementation. It is entitled:

AW Pioneer 1.0
Conformance Statement for DICOM
Direction 5492818-1EN

This DICOM Conformance Statement documents the DICOM Conformance Statement and Technical Specification required to interoperate with the GEHC network interface.

The GEHC Conformance Statement, contained in this document, also specifies the Lower Layer communications, which it supports (e.g., TCP/IP). However, the Technical Specifications are defined in the DICOM Part 8 standard.

For more information regarding DICOM, copies of the Standard may be obtained on the Internet at http://medical.nema.org. Comments on the Standard may be addressed to:

DICOM Secretariat
NEMA
1300 N. 17th Street, Suite 1752
Rosslyn, VA 22209
USA
Phone: +1.703.841.3200

1.3 INTENDED AUDIENCE

The reader of this document is concerned with software design and/or system integration issues. It is assumed that the reader of this document is familiar with the DICOM Standard and with the terminology and concepts, which are used in that Standard.

1.4 SCOPE AND FIELD OF APPLICATION

It is the intent of this document to provide an unambiguous specification for GEHC implementations. This specification, called a Conformance Statement, includes a DICOM Conformance Statement and is necessary to ensure proper processing and interpretation of GEHC medical data exchanged using DICOM. The GEHC Conformance Statements are available to the public.

The reader of this DICOM Conformance Statement should be aware that different GEHC devices are capable of using different Information Object Definitions. For example, a GEHC CT Scanner may send images using the CT Information Object, MR Information Object, Secondary Capture Object, etc.

Included in this DICOM Conformance Statement are the Module Definitions, which define all data elements, used by this GEHC implementation. If the user encounters unspecified private data elements while parsing a GEHC Data Set, the user is well advised to ignore those data elements (per the DICOM standard). Unspecified private data element information is subject to change without notice. If, however, the device is acting as a "full fidelity storage device", it should retain and re-transmit all of the private data elements, which are sent by GEHC devices.

1.5 IMPORTANT REMARKS

The use of these DICOM Conformance Statements, in conjunction with the DICOM Standards, is intended to facilitate communication with GE imaging equipment. However, **by itself, it is not sufficient to ensure that inter-operation will be successful**. The **user (or user's agent)** needs to proceed with caution and address at least four issues:

- **Integration** - The integration of any device into an overall system of interconnected devices goes beyond the scope of standards (DICOM v3.0), and of this introduction and associated DICOM Conformance Statements when interoperability with non-GE equipment is desired. The responsibility to analyze the applications requirements and to design a solution that integrates GE imaging equipment with non–GE systems is the **user's** responsibility and should not be underestimated. The **user** is strongly advised to ensure that such an integration analysis is correctly performed.

- **Validation** - Testing the complete range of possible interactions between any GE device and non–GE devices, before the connection is declared operational, should not be overlooked. Therefore, the **user** should ensure that any non–GE provider accepts full responsibility for all validation required for their connection with GE devices. This includes the accuracy of the image data once it has crossed the interface between the GE imaging equipment and the non–GE device and the stability of the image data for the intended applications.

  Such a validation is required before any clinical use (diagnosis and/or treatment) is performed. It applies when images acquired on GE imaging equipment are processed/displayed on a non-GE device, as well as when images acquired on non-GE equipment is processed/displayed on a GE console or workstation.

- **Future Evolution** - GE understands that the DICOM Standard will evolve to meet the user's growing requirements. GE is actively involved in the development of the DICOM Standard. DICOM will incorporate new features and technologies and GE may follow the evolution of the Standard. The GEHC protocol is based on DICOM as specified in each DICOM Conformance Statement. Evolution of the Standard may require changes to devices, which have implemented DICOM. **In addition, GE reserves the right to discontinue or make changes to the support of communications features (on its products) described by these DICOM Conformance Statements**. The **user** should ensure that any non–GE provider, which connects with GE devices, also plans for the future evolution of the DICOM Standard. Failure to do so will likely result in the loss of function and/or connectivity as the DICOM Standard changes and GE Products are enhanced to support these changes.

- **Interaction** - It is the sole responsibility of the **non–GE provider** to ensure that communication with the interfaced equipment does not cause degradation of GE imaging equipment performance and/or function.

1.6 REFERENCES

NEMA PS3	Digital Imaging and Communications in Medicine (DICOM) Standard, available free at http://medical.nema.org/
AWP VV DCS	AW Pioneer Volume Viewer DICOM Conformance Statement (Direction Number: 5492813-1EN)

1.7 DEFINITIONS

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definitions of these terms.

Abstract Syntax – the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples : Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

Application Entity (AE) – an end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title – the externally known name of an *Application Entity*, used to identify a DICOM application to other DICOM applications on the network.

Application Context – the specification of the type of communication used between *Application Entities*. Example: DICOM network protocol.

Association – a network communication channel set up between *Application Entities*.

Attribute – – a unit of information in an object definition; a data element identified by a *tag*. The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

Information Object Definition (IOD) – the specified set of *Attributes* that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The *Attributes* may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Joint Photographic Experts Group (JPEG) – a set of standardized image compression techniques, available for use by DICOM applications.

Media Application Profile – the specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs)

Module – a set of *Attributes* within an *Information Object Definition* that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation – first phase of *Association* establishment that allows *Application Entities* to agree on the types of data to be exchanged and how that data will be encoded.

Presentation Context – the set of DICOM network services used over an *Association*, as negotiated between *Application Entities*; includes *Abstract Syntaxes* and *Transfer Syntaxes*.

Protocol Data Unit (PDU) – a packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.

Security Profile – a set of mechanisms, such as encryption, user authentication, or digital signatures, used by an *Application Entity* to ensure confidentiality, integrity, and/or availability of exchanged DICOM data

Service Class Provider (SCP) – role of an *Application Entity* that provides a DICOM network service; typically, a server that performs operations requested by another *Application Entity* (*Service Class User*). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).

Service Class User (SCU) – role of an *Application Entity* that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU)

Service/Object Pair (SOP) Class – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance – an information object; a specific occurrence of information exchanged in a *SOP Class*. Examples: a specific x-ray image.

Tag – a 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]

Transfer Syntax – the encoding used for exchange of DICOM information objects and messages. Examples: *JPEG* compressed (images), little endian explicit value representation.

Unique Identifier (UID) – a globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR) – the format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

1.8 SYMBOLS AND ABBREVIATIONS

AE	Application Entity
AET	Application Entity Title
AWP	AW Pioneer
CR	Computed Radiography
CT	Computed Tomography
DICOM	Digital Imaging and Communications in Medicine
DX	Digital X-ray
GEHC	General Electric HealthCare
GSPS	Grayscale Softcopy Presentation State
IOD	Information Object Definition
KO	Key Object Selection
LUT	Look-up Table
MG	Mammography (X-ray)
MR	Magnetic Resonance Imaging
NM	Nuclear Medicine
O	Optional (Key Attribute)
PET	Positron Emission Tomography
R	Required (Key Attribute)
RF	Radiofluoroscopy

RT	Radiotherapy
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
SR	Structured Reporting
U	Unique (Key Attribute)
US	Ultrasound
VR	Value Representation
XA	X-ray Angiography

2. NETWORK CONFORMANCE STATEMENT

2.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the compliance to DICOM conformance requirements for the relevant **Networking** features on this GEHC product.

The AW Pioneer is a Networked Medical Imaging Console dedicated to Examination Review and Diagnosis on film. The system uses DICOM services to import images for possible further analysis or processing and to export images to other DICOM implementations, DICOM printers. It also uses the DICOM Storage Commitment service to transfer ownership of images to a remote workstation supporting storage commitment such as an archive system.

The AW Pioneer has the ability to compose films through the use of an application known as FILMER. The AW Pioneer uses DICOM Print Management Service Class to send images to hard copy printers. The films can then be used for possible further analysis.

The system provides a basis for applications built on top of it. These applications can create specific Information Object Definitions that will be described in the conformance statement of the added applications. The added applications can benefit the network facilities provided by the station.

This DICOM conformance statement refers to the DICOM standard PS3.3 for the description of standard IODs.

This DICOM conformance statement refers to other DICOM conformance statements for formal descriptions of IODs created by added applications:

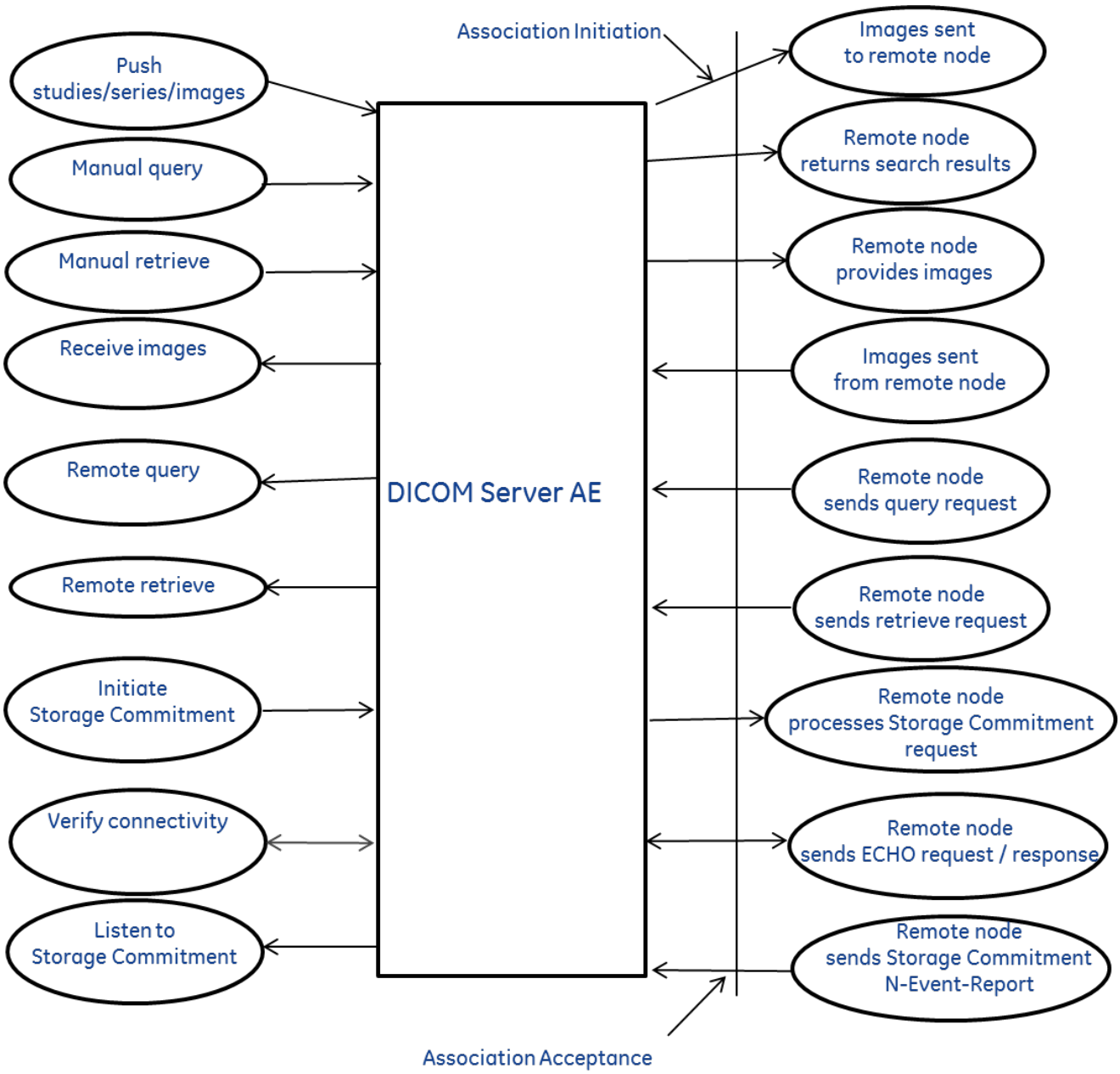
- GE Private 3D Model Objects are described in the AW VXTL DCS, see 1.6 - References

2.2 IMPLEMENTATION MODEL

2.2.1 Application Data Flow Diagram

The Basic and Specific Application models for this station are shown in the two following Illustration:

DICOM SERVER AE APPLICATION MODEL



Note: Verification SCU is available only through GEHC Service Tools.

The DICOM SERVER Application Entity (AE) is an application that handles DICOM protocol communication. The DICOM SERVER AE is automatically brought up when the AW Pioneer is powered on.

The DICOM SERVER AE is invoked by the following Real World Activities:

- Push studies/series/images

For this operation, the operator selects:

- Some studies, series or images on the AW Pioneer browser and then sends the selected studies, series or images to remote DICOM AE by a mouse right click and select "Send to" hostname that represents the wanted remote DICOM AE.

The transfer activity is displayed on a specific icon.

The declaration of remote DICOM AE is done through a specific application (known as Service Tools).

- Manual query

For this operation, the operator queries one or a set of remote DICOM databases to obtain a list of data at Study/Series/Image level by switch the hosts to the wanted remote DICOM AE. The query is selective based on criteria described below in the document.

- Manual retrieve

Once the remote browser is displayed (Manual Query), the operator can retrieve the SOP Classes supported by the AW Pioneer from the remote DICOM AE. The data can be retrieved at the Study and Series levels.

- Receive images

When images are installed in the local database, the Patient List displays the content of the AW Pioneer local database.

- Remote query

For this operation, a remote DICOM AE asks to obtain the list of data at Study/Series/Image level.

- Remote retrieve

For this operation, a remote DICOM AE asks to send data at Study/Series/Image level from the local AE to another DICOM Remote AE. The remote DICOM AE can ask to move the SOP Classes supported by the AW Pioneer at the Study/Series/Image level. The Remote DICOM AE shall be declared locally on the AW Pioneer. The declaration of remote DICOM AE is done through a specific application (known as Service Tools).

- Initiate Storage Commitment

For this operation, the operator selects some studies, series or images on the browser and clicks on the icon that represents the wanted remote DICOM AE. This initiates the DICOM push of the selected exam/series/images to the remote AE. After the successful storage of the selected exam/series/images on the remote AE, a storage commitment request is sent to the remote DICOM AE. The transfer/storage commit activity is displayed on a specific icon.

- Verify Connectivity

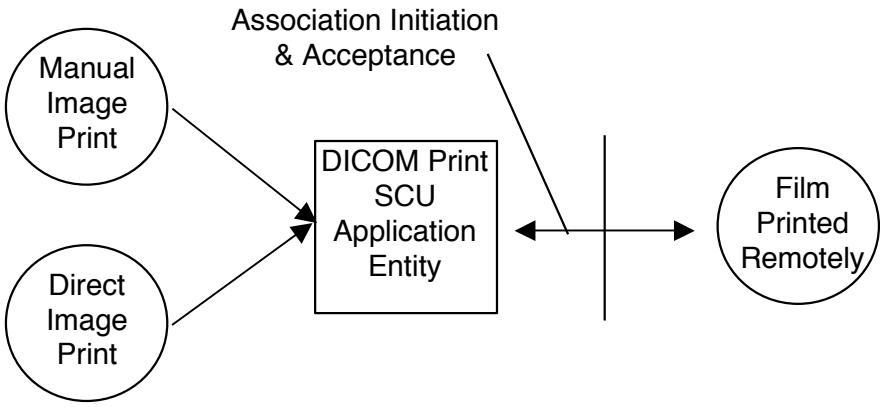
The operator can choose to verify a remote Application Entity. Upon user's request, DICOM SERVER AE sends out a verification request to a Remote AE.

The DICOM SERVER AE also acts as an SCP for incoming Verification requests. No operator action is required to process Verification requests from Remote AEs.

- Listen to Storage Commitment.

The DICOM SERVER AE is indefinitely listening for association requests. No operator action is required to receive a Storage Commitment notification (N-EVENT-REPORT).

DICOM Print SCU Application Entity Model



The DICOM Print SCU Application Entity (AE) is an application that handles the DICOM protocol communication with Remote DICOM Printers. The DICOM Print SCU AE is activated when the user requests for a print.

The DICOM Print SCU AE is invoked by the following Real World Activities:

- Manual Image Print

For this operation, the operator uses the *FILMER* application to prepare a layout of images and send the pages to the *PRINT UILDER.*

- Direct Image Print

For this operation, the operator displays the images in the *VIEWER* and sends the images directly to the *PRINT BUILDER*.

In both cases, the *PRINT BUILDER* receives the "Simple print" request, composes a film then sends the film to the selected Remote DICOM Printer

2.2.2 Functional Definition of AE

DICOM SERVER AE:

The DICOM SERVER AE initiates the following operations:

Remote query/Push:

- Access to patient demographics and pixel data in the local database.
- Build a DICOM format data set.
- Initiate a DICOM association to send DICOM SOP Instances to a remote DICOM AE.

Query/Retrieve:

- Initiate a DICOM association to ask for remote patient demographics.

Retrieve:

- Initiate a DICOM association to ask for transmitting images from a remote DICOM AE to AW Pioneer.

Storage Commitment N-Action:

- Initiate a DICOM association to ask for the storage commitment of specific images and wait for a Storage Commitment Notification (N-EVENT-REPORT)

- Initiate a DICOM association and wait for a Storage Commitment Notification (N-EVENT-REPORT)

The DICOM SERVER AE waits for association requests from Remote AE:

Receive Images:

- Answer to DICOM associations transmitting DICOM SOP Instances to be stored on the AW Pioneer.

Verification SCP:

- Answer to DICOM associations transmitting Verification SOP Instance to the AW Pioneer.

Listen to remote Storage Commitment SCP**:**

- Answer to DICOM associations transmitting Storage Commitment Notification (N-EVENT-REPORT)

DICOM PRINT SCU AE:

The DICOM Print SCU AE supports the following functions:

- Access to pixel data
- Initiate a DICOM association to send DICOM SOP Classes (corresponding to the DICOM Print Management service class) to a remote DICOM Printer

2.2.3 Sequencing of Real-World Activities

DICOM SERVER AE:

This sequence applies in case the storage commitment is configured for Remote AE

1. The user selects the images and sends them to a remote host.

2. If the remote DICOM AE is associated with a Storage Commitment Provider AE and if the images are successfully sent to the DICOM AE, then a N-ACTION-RQ request is sent automatically to the associated Storage Commitment Provider AE.

3. Waits for N-ACTION-RSP from a remote Storage Commitment Provider AE.

4. On reception of failure in N-ACTION-RSP, the Storage Commitment AE logs the error.

5. On reception of success, Storage Commitment AE is ready to receive at any time from Storage Commitment Provider the N-EVENT-REPORT-RQ notification.

6. On reception of a successful N-EVENT-REPORT-RQ notification from Storage Commitment Provider, the images are flagged as committed in the database.

7. The Storage Commitment AE sends a N-EVENT-REPORT-RSP to the Storage Commitment Provider

DICOM PRINT SCU AE:

The user selects the remote DICOM Printer from Print Builder Graphical User Interface.

1. The images to be printed shall be dragged and drop into the FILMER application either manually or automatically.
2. The PRINT BUILDER receives the "Simple print" request, composes a film then activates the DICOM Print SCU AE that initiates the following actions.
3. The PRINT BUILDER Initiates a DICOM association and selects a Presentation Context.
4. N-GETs printer status from the Printer SOP Instance
    a. If the Printer Status is FAILURE
        i. The failure is displayed to the user
        ii. The association is aborted
    b. Else
        i. The warning is displayed to the user
        ii. The Print goes on
    c. Endif
5. N-CREATEs a Basic Film Session SOP Instance
6. N-CREATEs a Basic Film Box SOP Instance for the current film
7. N-SETs the Basic Film Box SOP Instance with the Image Box SOP Instance for each image on the film
8. N-ACTIONs on the Basic Film Box SOP Instance
9. N-DELETEs on the Basic Film Box SOP Instance
10. Releases the DICOM association after printing is successful or failure has been signaled to the user

Note: If DICOM_PRINT_WAIT_SCP_EVENT environment variable is set, then the DICOM print SCU handles the N-EVENT-REPORT sent by the printer but does not read the message content except Printer Status and Printer Status Info fields.

2.3 AE SPECIFICATIONS

2.3.1 DICOM SERVER AE Specification

This Application Entity provides Standard Conformance to the following DICOM SOP Classes as a **SCU**:

SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1

SOP Class Name	SOP Class UID
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
GE Private DICOM RT Plan	1.2.840.113619.4.5.249
NM Genie Private Data	1.2.840.113619.4.27
PET Advance Private Data	1.2.840.113619.4.30
GE Private DICOM 3D Object	1.2.840.113619.4.26
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
Storage Commitment Push Model	1.2.840.10008.1.20.1

SOP Class Name	SOP Class UID
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1
Verification SOP Class	1.2.840.10008.1.1

Note: C-FIND is done using Study Root Information Model.

Note: The AW Pioneer is able to push the GSPS SOP Class 1.2.840.10008.5.1.4.1.1.11.1.

Note: Only GEHC Service tool can use Verification SCU

This Application Entity provides Standard Conformance to the following DICOM SOP Classes as a **SCP**:

SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
GE Private DICOM RT Plan	1.2.840.113619.4.5.249
NM Genie Private Data	1.2.840.113619.4.27
PET Advance Private Data	1.2.840.113619.4.30

SOP Class Name	SOP Class UID
GE Private DICOM 3D Object	1.2.840.113619.4.26
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Verification SOP Class	1.2.840.10008.1.1
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1

Note: The AW Pioneer is able to store the GSPS SOP Class 1.2.840.10008.5.1.4.1.1.11.1 in its local database.

2.3.1.1 Association Establishment Policies

2.3.1.1.1 General

The DICOM Application Context Name (ACN), which is always proposed, is:

Application Context Name	1.2.840.10008.3.1.1.1

The maximum length PDU negotiation is included in all association establishment requests.

The maximum length PDU for an association initiated by the DICOM SERVER AE is:

Maximum Length PDU	64234 Bytes

Note: The SOP Class Extended Negotiation is not supported.

Note: This length is not configurable

Note: The user information Items sent by this product are:

- Maximum PDU Length
- Implementation UID

2.3.1.1.2 Number of Associations

The DICOM SERVER AE will initiate only one DICOM association at a time to perform a DICOM store operation as a SCU to a Remote Host AE.

The DICOM SERVER AE will initiate only one DICOM association at a time to perform a DICOM Query/Retrieve operation as a SCU with a Remote Host AE.

The DICOM SERVER AE can have a maximum of 10 open DICOM associations at a time to perform a DICOM operation as a SCP.

Note: The number of associations is not configurable

2.3.1.1.3 Asynchronous Nature

Asynchronous mode is not supported. All operations will be performed synchronously.

2.3.1.1.4 Implementation Identifying Information

The Implementation UID for this DICOM Implementation is:

AW Pioneer Implementation UID	**1.2.840.113619.6.362**

2.3.1.2 Association Initiation Policy

When the DICOM SERVER Application Entity initiates an Association for any Real-World Activity, it will propose the Presentation Contexts for all Real-World Activities; i.e., there is only a single, comprehensive Presentation Context Negotiation proposed for the AE.

The DICOM SERVER Application Entity proposes only a single Transfer Syntax in each Presentation Context; i.e., for each Abstract Syntax in the following Presentation Context Tables, the AE proposes one Presentation Context for each specified Transfer Syntax.

2.3.1.2.1 Real-World Activity: Push studies/series/images

The DICOM SERVER AE initiates a new association with a remote DICOM AE for each job selected by the operator. The operator can select to push to a remote DICOM AE:

- a study, a series, an image or
- a set of several images that belong to the same patient through the end review paradigm

Each association corresponds to the Real World Activities:

- Push manually Studies/Series/Images to a remote DICOM AE
- Push the selection or a subset of the selection to a set of remote DICOM AEs through the end review paradigm

2.3.1.2.1.1 Associated Real-World Activity

The operator can select in the BROWSER one or several Studies (or Series, or Images) to be sent. Then, the user, by right clicking onto the selection, can select the Remote DICOM AE on which the selection will be sent. The user can also decide to use the 'end review'

paradigm to send a set of series of the same patient (to be configured in the AWP service tools).

2.3.1.2.1.2 Proposed Presentation Context

The following table shows the proposed presentation contexts for the DICOM Server AE after Real-World Activity "Push" Operation has been performed.

Presentation Context Table - Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Secondary Capture Image	1.2.840.10008.5.1.4.1.1	Implicit VR Little	1.2.840.10008.1.2	SCU	None

Presentation Context Table - Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Storage	.7	Endian			
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Presentation Context Table - Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

Presentation Context Table - Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
NM Genie Private Data	1.2.840.113619.4.27	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
NM Genie Private Data	1.2.840.113619.4.27	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
NM Genie Private Data	1.2.840.113619.4.27	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
PET Advance Private Data	1.2.840.113619.4.30	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
PET Advance Private Data	1.2.840.113619.4.30	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
PET Advance Private Data	1.2.840.113619.4.30	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Multi-frame	1.2.840.10008.5.1.4.1.1	Explicit VR Little	1.2.840.10008.1.2	SCU	None

Presentation Context Table - Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Image Storage	.3.1	Endian	.1		
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Grayscale Softcopy	1.2.840.10008.5.1.4.1.1	Explicit VR Big	1.2.840.10008.1.2	SCU	None

Presentation Context Table - Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Presentation State Storage	.11.1	Endian	.2		
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

2.3.1.2.1.2.1 SOP Specific DICOM Conformance Statement for C-MOVE SOP Classes

The C-MOVE-RQ will use the AE Title of the AW Pioneer Application Entity as the Move Destination AE Title.

A C-MOVE CANCEL will be sent if the operation is canceled from AWP service tools

Following are the status codes that are more specifically processed when receiving messages from a **Retrieve** SCP equipment:

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	A701	Refused: Out of resources - Unable to calculate number of matches	Error displayed in the Network status, in AWP service tools
	A702	Refused: Out of resources - Unable to perform sub-operations	Error displayed in the Network status, in AWP service tools
	A801	Refused: Move Destination Unknown	Error displayed in the Network status, in AWP service tools
	A900	Error: Identifier does not match SOP Class	Error displayed in the Network status, in AWP service tools
	C000-CFFF	Error: Unable to process	Error displayed in the Network status, in AWP service tools
	0122	SOP Class Not Supported	Error displayed in the Network status, in AWP service tools

Cancel	FEoo	Sub-operations terminated due to a Cancel indication	Error displayed in the Network status, in AWP service tools
Warning	Booo	Sub-operations Complete - One or more Failures.	Log-files updated
Success	oooo	Sub-operations Complete - No Failure.	Success status displayed in the Network status, in AWP service tools
Pending	FFoo	Sub-operations are continuing -	No action
*	*	Any other status code.	No action

2.3.1.2.1.2.2 SOP Specific DICOM Conformance Statement for Image Storage SOP Classes

This implementation can perform multiple C-STORE operations over a single association.

Upon receiving a C-STORE confirmation containing a successful status, this implementation will perform the next C-STORE operation. The association will be maintained if possible.

Upon receiving a C-STORE confirmation containing a Refused status, this implementation will terminate the association.

Upon receiving a C-STORE confirmation containing any status that is not Success or Refused, this implementation will consider the current request to be a failure and will terminate the association except if the C-STORE is invoked from a C-MOVE SCP. In this case it will continue to attempt to send the remaining images in the request on the same association.

Each C-STORE operation supports an "Association Timer". This timer starts when the association request is sent and stops when the association is established. Default time-out is 60 seconds.

Each C-STORE operation supports an "Operation Inactivity Timer". This timer starts when a C-STORE request is emitted and is reset each time a C-STORE response has been received, or when subsequent C-STORE are received. Default time-out is 300 seconds.

If any of the two timers mentioned above expires, the connection is aborted and the operation is considered as failed.

2.3.1.2.2 Real-World Activity: Manual query

The DICOM SERVER AE initiates a new association for querying Study Folders (or Series/Images) on a remote DICOM AE. This association corresponds to one Real World Activity.

2.3.1.2.2.1 Associated Real-World Activity

The operator queries a Remote database or a set of Remote databases by clicking on the corresponding icon. A new BROWSER (known as the REMOTE BROWSER) appears on the screen(s) upon successful query.

The *"Query"* operation will cause the DICOM Server AE to initiate an association to the selected Remote AE. Once a list of Study/Series/Image has been queried, the operator can invoke the *"Retrieve"* operation from the displayed REMOTE BROWSER (Right click on the selection and click on the "Copy to local").

2.3.1.2.2.2 Proposed Presentation Context Table

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

2.3.1.2.2.2.1 SOP Specific DICOM Conformance Statement for C-FIND-SCU

The C-FIND SCU will only perform hierarchical query (No extended negotiation supported)

Each C-FIND SCU supports an "Association Timer" and an "Operation Inactivity Timer". These timers are defaulted to 30 and 300 seconds.

The DICOM SERVER AE will parse each matching C-FIND-RSP reply and will abort the association if an entry does not contain a valid dataset.

During C-FIND SCU AW Pioneer is able to generate a C-FIND-CANCEL.

Several filters type can be applied for the query; here is the list of the supported filter type:

Filter type	Filter description
Single Value Matching	This is to obtain an exact match on the value contained in a Key Attribute
List of UID Matching	This is to obtain a match on any of the UID items present in a list of UIDs in a Key Attribute.
Wild Card Matching	This is to obtain a match on any sequence of characters contained in a Key Attribute. "*" or "?" characters present in the Key Attribute, where "*" shall match any sequence of characters and "?" matches against a single character.

Range Matching	This is to obtain a match on values of date and time contained in the Key Attributes "<date1> - <date2>" to match against all values that fall in this date range "-<date>" to match against all values that are before this date "<date> -" to match against all values that are after this date

Following table shows the various fields that are requested at the Study level of the C-FIND request:

Description	Tag	Type	Value
Study Date	0008,0020	R	Study dates (supported filter: single value matching, range matching)
Study Time	0008,0030	R	Study times (supported filter: single value matching, range matching))
Accession Number	0008,0050	R	Accession Number (supported filter: single value matching, wild card matching)
Patient's Name	0010,0010	R	Beginning of the patient's name: a "*" is automatically added at the end of the user query. If the user needs to do a query onto a criterion (last name, first name), s/he will have to put a caret between the last and the first name. (Supported filter: single value matching, wild card matching)
Patient ID	0010,0020	R	Patient ID (supported filter: single value matching, wild card matching)
Study ID	0020,0010	R	Zero length
Study Instance UID	0020,000D	U	Zero length
Modalities in Study	0008,0061	O	Requested modalities (supported filter: single value matching)
Study Description	0008,1030	O	Zero length
Patient's Birth Date	0010,0030	O	Zero length
Patient's Sex	0010,0040	O	Zero length
Patient's Birth Time	0010,0032	O	Zero length
Station Name	0008,1010	O	Zero length

Note: During C-FIND SCU AW Pioneer requires setting up a filter before sending a query. At refresh the currently set filter will be applied.

Following table shows the various fields that are requested at the Series level of the C-FIND request when building the list of series of a given study.

Description	Tag	Type	Value
Series Number	0008,0011	R	Zero length
Modality	0008,0060	R	Zero length
Series Instance UID	0020,000E	U	Zero length
Series Description	0008,103E	O	Zero length
Series Date	0008,0021	O	Zero Length
Series Time	0008,0031	O	Zero length
Number Of Series Related Instances	0020,1209	O	Zero length
Image Type (for legacy systems)	0008,0008	O	Zero length

Following table shows the various fields that are requested at the Image level of the C-FIND request when building the list of instances of a given series. The list of requested fields depends on the value returned for the Modality (0008,0060) in the C-FIND-RSP response at series level given by the remote AE.

Description	Tag	Type	Value	Modality
Instance Number	0020,0013	R	Zero length	All
SOP Instance UID	0008,0018	U	Zero length	All
SOP Class UID	0008,0016	O	Zero length	All
Image ID	0054,0400	O	Zero length	All
Modality	0008,0060	O	Zero length	All
Contrast Bolus Agent	0018,0010	O	Zero length	All
Slice Thickness	0018,0050	O	Zero length	All
Repetition Time	0018,0080	O	Zero length	All
Echo Time	0018,0081	O	Zero length	All
Inversion Time	0018,0082	O	Zero length	All
Number Of Averages	0018,0083	O	Zero length	All
Echo Number	0018,0086	O	Zero length	All
Spacing Between Slices	0018,0088	O	Zero length	All
Data Collection Diameter	0018,0090	O	Zero length	All
Trigger Time	0018,1060	O	Zero length	All
Reconstruction Diameter	0018,1100	O	Zero length	All
Gantry Detector Tilt	0018,1120	O	Zero length	All
Convolution Kernel	0018,1210	O	Zero length	All
Flip Angle	0018,1314	O	Zero length	All
Slice Location	0020,1041	O	Zero length	All
Rows	0028,0010	O	Zero length	All
Columns	0028,0011	O	Zero length	All

During the C-FIND SCU, the following pending status values supported by AW Pioneer:

- oxFF00: Study/Series/Image items contained in identifier is collected for later display or further processing and wait for the next response from the remote host, all the optional keys were supported.

- oxFF01: Study/Series/Image items contained in identifier is collected for later display or further processing and wait for the next response from the remote host, one or more optional keys were not supported for this identifier.

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	A700	Refused: Out of resources	AW Pioneer platform throws error: "No Resource error"
	A900	Error: Identifier does not match SOP Class	AW Pioneer platform throws error: "Identifier does not match sop error"
	C000-CFFF	Error: Unable to process	AW Pioneer platform throws error: "Processing failure"
	0122	SOP Class Not Supported	Ignored
Cancel	FE00	Matching terminated due to cancel	1. Considered as invalid status and the operation is terminated if the query CANCEL was not

			requested. 2. If the query CANCEL was requested by the SCU, then system gracefully exits the C-FIND request processing.
Success	0000	Matching is complete - No final identifier is supplied	Processed and gracefully exits the C-FIND request processing
Pending	FF00	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	Processed and the data is displayed in the Browser
	FF01	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier	Processed and the data is displayed in the Browser
*	*	Any other status code.	Ignored

2.3.1.2.3 Real-World Activity: Manual retrieve

The DICOM SERVER AE initiates a new association for retrieving Studies and Series on a remote DICOM AE. This association corresponds to one Real World Activity.

2.3.1.2.3.1 Associated Real-World Activity

The operator then has to perform the Real-World activity *"Manual query"* to get a list of Studies, Series. Once the list of list of Studies, Series is retrieved, the operator can invoke the *"Retrieve"* operation from the displayed REMOTE BROWSER (Right click on the selection and click on the "Copy to local").

2.3.1.2.3.2 Proposed Presentation Context Table

When the remote DICOM AE is declared as a Study Root Provider or the invoked operation is "Copy to local", the presentation context shown in following table is proposed.

Presentation Context Table – Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

2.3.1.2.3.2.1 SOP Specific DICOM Conformance Statement for the Study Root Query/Retrieve Information Model - MOVE SOP Classes

When the operator starts a *Move* operation at any level (Study, Series, Image) the DICOM Server AE will initiate a C-MOVE-RQ request to the Remote AE with the DICOM Server AE as the Destination AE. The Storage SCP ("Receive Images from Remote AE") will handle the incoming images.

Each C-MOVE SCU supports an "Association Timer" and an "Operation Inactivity Timer". These timers are defaulted to 60 and 300 seconds. These timers are not configurable.

If the C-MOVE SCU receives a status different from success (0x0000) or pending (0xFF00) during the association, the DICOM Server AE will release the association. This information will be logged in the system log files; in AWP service tools, the network queue will be updated accordingly.

During C-MOVE SCU AW Pioneer is able to generate a C-MOVE-CANCEL (from AWS service tools).

When receiving a Cancel request response (0xFE00), the DICOM Server AE will release the association. This information will be logged in the system log files.

2.3.1.2.4 Real-World Activity: Initiate Storage Commitment

Only one N-ACTION request is sent for all images that have been sent during the Real World Activity: "Push studies/series/images"

2.3.1.2.4.1 Associated Real-World Activity

The operator can associate a DICOM Storage Commitment Provider AE to a Remote AE.

The user selects in the BROWSER one or several studies, series or images to be sent. Then, the user can right click mouse and choose "Send to" and click on Remote DICOM AE.

This operation will cause the following actions:

- The AW Pioneer retrieves the appropriate DICOM images to push from its database.
- The DICOM SERVER AE initiates a DICOM association, negotiates with the Remote AE an appropriate Abstract and Transfer Syntax.
- If the negotiation is successful, the DICOM SERVER AE emits C-STORE command to send the images to the Remote AE.
- When the images have been sent, the DICOM SERVER AE emits a N-ACTION request (immediately after the C-STORE request) to ask for a commitment on images previously sent. Only one N-ACTION request is sent for all images to be committed. N-ACTION is on different association than the C-STORE request

2.3.1.2.4.2 Proposed Presentation Context

Presentation Context Table – Proposed

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.3.1.2.4.2.1 SOP Specific DICOM Conformance Statement for the Storage Commitment Push Model SOP Class (N-ACTION)

If the received N-ACTION Response from the Storage Commitment Provider has a failure status, an error file is logged, the Storage Commitment is abandoned. The Network activity icon will change in order to show the error condition.

If the received N-ACTION Response from the Storage Commitment Provider has a success status, the DICOM SERVER AE waits for an N-EVENT-REPORT during a configurable period of time. This period is set to 10s by default. There is no other timeout. This timeout is not configurable.

The DICOM SERVER AE can receive a N-EVENT-REPORT from the Storage Commitment Provider at any time (See section *Real-World Activity "Listen to remote Storage Commitment"*).

Following are the status codes that are more specifically processed when receiving N-Action responses from Storage Commitment SCP equipment:

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	0119	Class-instance conflict	Appropriate error message is logged in nwscp.log file. If the error message contains failed sop instance uid's those will logged in the log file Example error message: depending on the error code following message will be logged. "0x0110 (Processing Failure)"; "0x0112 (No Such Object Instance)"; "0x0213 (Resource Limitation)"; "0x0122 (Referenced SOP Class Not Supported)"; "0x0119 (Class/Instance Conflict)"; "0x0131 (Duplicate Transaction UID)";
	0210	Duplicate invocation	Same as above
	0115	Invalid argument value	Same as above
	0117	Invalid SOP Instance	Same as above

	0212	Mistyped argument	Same as above
	0123	No such action	Same as above
	0114	No such argument	Same as above
	0118	No such SOP Class	Same as above
	0112	No such SOP Instance	Same as above
	0110	Processing failure	Same as above
	0213	Resource limitation	Same as above
	0211	Unrecognized operation	Same as above
Success	0000		Same as above
*	*	Any other status code.	Same as above

If a Storage Commitment N-EVENT-REPORT is received on the Association initiated by this Application Entity, it will be processed as described for Association initiated by the Storage Commitment SCP (see Section 2.3.1.3.1.2.6).

2.3.1.2.5 Real-World Activity: Verify connectivity

The DICOM SERVER AE initiates a new association for checking the status of the Remote AE. This association corresponds to one Real World Activity.

2.3.1.2.5.1 Associated Real-World Activity

The service engineer would like to check whether a Remote AE is up and DICOM services are available. For this operation, service engineer press the button "Check DICOM" for a remote node to check the status of the remote DICOM Verification SOP class.

2.3.1.2.5.2 Proposed Presentation Context Table

The DICOM SERVER AE proposes the following 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	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.3.1.3 Association Acceptance Policy

2.3.1.3.1 Real-World Activity: Receive images

This AE is indefinitely listening for associations. No operator action is required to receive an image.

The DICOM SERVER AE refuses the association if they are too many open connections. Sends the association rejection error. Status will be "transient rejection".

2.3.1.3.1.1 Associated Real-World Activity

The Real-World Activity associated with the Receive Images operation is the storage of the images on the disk drive of the AW Pioneer and the declaration of the images in the database of the same station.

2.3.1.3.1.2 Presentation Context Table

Acceptable Presentation Contexts for DICOM Server AE and Real-World Activity Receive Images from Remote AE.

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

Presentation Context Table – Accepted					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

Presentation Context Table – Accepted					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
RT Structure Set	1.2.840.10008.5.1.4.1.1	Implicit VR Little	1.2.840.10008.1.2	SCP	None

Presentation Context Table – Accepted					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Information Storage	.481.3	Endian			
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
NM Genie Private Data	1.2.840.113619.4.27	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
NM Genie Private Data	1.2.840.113619.4.27	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
NM Genie Private Data	1.2.840.113619.4.27	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
PET Advance Private Data	1.2.840.113619.4.30	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
PET Advance Private Data	1.2.840.113619.4.30	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
PET Advance Private Data	1.2.840.113619.4.30	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

Presentation Context Table – Accepted					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
GE Private DICOM 3D Object	1.2.840.113619.4.26	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	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	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

Presentation Context Table – Accepted					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

Note: The Grayscale Softcopy Presentation State Storage abstract syntax is accepted but the basic AW Pioneer applications do not manage this object.

2.3.1.3.1.2.1 SOP Specific Conformance to Storage SOP Classes

AW Pioneer is Storage Level 2.

Private elements are not discarded from the image when receiving images containing non-GE private data elements.

Each C-STORE SCP operation supports an "Operation Inactivity Timer" with time out values of 15-seconds. This timer is not configurable.

Image Reception phase:

In case of failure, the image will not be installed in the local database and the DICOM Server AE will return one of the following status codes for the C-STORE:

- Cooo (Cannot understand) indicates that the processing failed during the reception of the image.
- A700 (No Resources) Indicates that probably there was not enough disk space to store the image. The user should attempt recovery by removing some images from the AW Pioneer.

In the event of a successful C-STORE operation, the image has successfully been declared in the database.

The image will then be accessed in the same manner as any other image by the applications on the AW Pioneer.

Images may be deleted when instructed to do so by the user. The users of the AW Pioneer determine the duration of the storage of the image.

When a C-STORE operation returns Error, the network status indicator icon will change in the browser informing the user of a failure. The details of the problem can be checked in the DICOM Queue tool of Service Tools.

2.3.1.3.1.3 Presentation Context Acceptance Criterion

Only known SOP Classes are accepted.

2.3.1.3.1.4 Transfer Syntax Selection Policies

The transfer syntax selection policy is the following:

- Only the following transfer syntaxes are accepted: Implicit VR Little Endian (1.2.840.10008.1.2), Explicit VR Little Endian (1.2.840.10008.1.2.1), Explicit VR Big Endian (1.2.840.10008.1.2.2)
- Among all the remaining proposed transfer syntaxes, the explicit transfer syntaxes are chosen first.
- Among all the remaining proposed transfer syntaxes, the little endian transfer syntaxes are chosen first.

2.3.1.3.2 Real-World Activity: Remote query

This AE is indefinitely listening for associations. No operator action is required to respond to a *query* request.

2.3.1.3.2.1 Associated Real-World Activity

The Real-World Activity associated with the query request is to search the local database for entries that match the request and send a C-FIND response message with a status of "pending" for each matching entry and send a C-FIND response message with a status of "success" after the last "pending" response.

If the C-FIND SCP receives a C-FIND-CANCEL request, it sends a C-FIND response message with a status of "cancel".

2.3.1.3.2.2 Accepted Presentation Context Table

Presentation Context Table – Accepted DICOM Server AE and Real-World Activity Query Request.					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.3.1.3.2.2.1 SOP Specific Conformance to C-FIND SCP

Each C-FIND SCP operation supports an "Operation Inactivity Timer" with a time out value of 15 seconds. This timer corresponds to the number of seconds to wait when data between TCP/IP packets are transferred. It is not configurable.

All Required (R) and Unique (U) study, series, and image level keys for the Study-Root Query/Retrieve information model are supported. Some optional (O) keys are also supported as described in the following tables.

Following is the supported study level keys:

Description	Tag	Type	Usage
Study Date	(0008,0020)	R	Matched
Study Time	(0008,0030)	R	Matched
Accession Number	(0008,0050)	R	Matched
Patient's Name	(0010,0010)	R	Matched
Patient ID	(0010,0020)	R	Matched
Study ID	(0020,0010)	R	Matched
Study Instance UID	(0020,000D)	U	Matched
Modalities In Study	(0008,0061)	O	Matched
Referring Physicians Name	(0008,0090)	O	Matched
Study Description	(0008,1030)	O	Returned
Patients Sex	(0010,0040)	O	Returned

Note: Patient Name matching is case sensitive.

Note: Wildcard query is supported for Patient's Name, Patient ID and Accession Number.

Note: Range matching is supported on Date & time

Following is the supported series level keys:

Description	Tag	Type	Usage

Modality	(0008,0060)	R	Matched
Series Number	(0020,0011)	R	Matched
Series Instance UID	(0020,000E)	U	Matched
Series Description	(0008,103E)	O	Returned

Following is the supported image level keys:

Description	Tag	Type	Usage	Modality
Instance Number	(0020,0013)	R	Matched	All
SOP Instance UID	(0008,0018)	U	Matched	All
Rows	(0028,0010)	O	Returned	All
Columns	(0028,0011)	O	Returned	All

Only keys with Usage type *Matched* will be matched against values in the database.

Values in keys of type *Returned* will be ignored and will be filled in with data from the database.

If an optional key is requested that does not appear in any of the tables above, that key will be ignored and no corresponding element will be returned.

If the database does not have a value corresponding to any requested optional key a zero-length element will be returned.

Sequence matching is not supported.

Range matching is supported for attributes of type date and time.

Only hierarchical query is supported. The C-FIND SCP will not perform any extended negotiation.

During the C-FIND SCP, the DICOM Server AE can send the following status:

- oxFE00 when the DICOM remote AE sent a DICOM C-FIND CANCEL request
- oxFF00: for pending messages
- oxFF01: for pending messages when the DICOM remote AE asked for optional key
- oxA700 when refused due to unavailable resources.
- oxA900 when the DICOM Server AE processes an invalid data set.
- oxC001 when the DICOM Server AE processes an internal error or a decoding error
- ox0000 in case of success

2.3.1.3.2.3 Presentation Context Acceptance Criterion

The DICOM SERVER AE evaluates each Presentation Context independently, and accepts any Presentation Context that matches an Abstract Syntax for any Real-World Activity.

2.3.1.3.2.4 Transfer Syntax Selection Policies

The transfer syntax selection policy is the following:

- Only the following transfer syntaxes are accepted: Implicit VR Little Endian (1.2.840.10008.1.2), Explicit VR Little Endian (1.2.840.10008.1.2.1), Explicit VR Big Endian (1.2.840.10008.1.2.2)
- Among all the remaining proposed transfer syntaxes, the explicit transfer syntaxes are chosen first.
- Among all the remaining proposed transfer syntaxes, the little endian transfer syntaxes are chosen first.

2.3.1.3.3 Real-World Activity: Remote retrieve

This AE is indefinitely listening for associations. No operator action is required to respond to a *retrieve* request.

The DICOM SERVER AE rejects the association if they are too many open connections.

The DICOM SERVER AE rejects the association if the Remote DICOM AE is not declared on the local AW Pioneer.

The DICOM SERVER AE sends the association rejection error. Status will be "transient rejection".

2.3.1.3.3.1 Associated Real-World Activity

The Real-World Activity associated with the Retrieve Request is to send all images corresponding to the C-MOVE request to the destination AE through a separate association.

If the C-MOVE SCP receives a C-MOVE-CANCEL request, it closes the separate association.

2.3.1.3.3.2 Accepted Presentation Context Table

Presentation Context Table – Accepted by DICOM Server AE for Real-World Activity Retrieve Request.					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.3.1.3.3.2.1 SOP Specific Conformance to C-MOVE SCP

The DICOM Server AE provides standard conformance to the baseline Study-root C-MOVE Service Class SCP.

Each C-MOVE SCP operation supports an "Operation Inactivity Timer" with a time out value of 15 seconds. This timer corresponds to the number of seconds to wait when data between TCP/IP packets are transferred.

All images requested in a C-MOVE-RQ will be sent over a single association. A C-MOVE-RSP with a "pending" status will be returned to the requester after every C-STORE request sub-operation.

Note: Move destination AE can be different than the AE requesting the C-MOVE

The C-MOVE SCP will invoke C-STORE requests for the following SOP classes:

SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
GE Private DICOM RT Plan	1.2.840.113619.4.5.249

SOP Class Name	SOP Class UID
NM Genie Private Data	1.2.840.113619.4.27
PET Advance Private Data	1.2.840.113619.4.30
GE Private DICOM 3D Object	1.2.840.113619.4.26
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1

During the C-MOVE SCP, the DICOM Server AE can send the following status:

- oxFE00: (C-Move Cancel Request Received) when the C-MOVE SCU cancelled the operation
- oxA702: when the association with the C-STORE SCP was rejected
- oxA801: when the destination unknown
- oxA900: when the dataset is invalid
- oxFF00: for pending messages.
- oxB000 when one or more failure occurred
- ox0000 when the whole C-MOVE operation was successful

2.3.1.3.3.3 Presentation Context Acceptance Criteria

No criterion.

2.3.1.3.3.4 Transfer Syntax Selection Policy

The transfer syntax selection policy is the following:

- Only the following transfer syntaxes are accepted: Implicit VR Little Endian (1.2.840.10008.1.2), Explicit VR Little Endian (1.2.840.10008.1.2.1), Explicit VR Big Endian (1.2.840.10008.1.2.2)
- Among all the remaining proposed transfer syntaxes, the explicit transfer syntaxes are chosen first.

- Among all the remaining proposed transfer syntaxes, the little endian transfer syntaxes are chosen first.

2.3.1.3.4 Real-World Activity: Listen to remote Storage Commitment

The DICOM SERVER AE is indefinitely listening for associations. No operator action is required to receive a Storage Commitment notification (N-EVENT-REPORT).

The Storage Commitment Provider initiating the association must use the role selection negotiation.

2.3.1.3.4.1 Associated Real-World Activity

The Real-World Activity associated consists into:

- Flag the images that have been committed (transfer of ownership) in the database.
- Pop up an error when some images of a patient existing in the database have not been committed.

2.3.1.3.4.2 Accepted Presentation Context

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.3.1.3.4.2.1 SOP Specific DICOM Conformance Statement for the Storage Commitment Push Model SOP Class (N-EVENT-REPORT)

Following are the status codes the Application may send back to the SCP Equipment after receiving the N-EVENT-REPORT:

Service Status	Status Codes	Further Meaning	Status Code sending explanation	Related Fields sent back to the SCU
Error	0110	Processing Failure	Indicates that an internal error occurs while processing.	None
Success	0000			None

The DICOM SERVER AE parses all the items present in the N-EVENT-REPORT.

For each image successfully committed, the image is flagged as "Committed" into the database. An error is logged for any image that cannot be committed and a pop up is displayed to the user when the image still exists in the database.

There is no timeout related to this module: the DICOM SERVER AE is listening indefinitely the N-EVENT-REPORT event. If such event is received, some processing is immediately executed.

2.3.1.3.4.3 Presentation Context Acceptance Criterion

The DICOM SERVER AE evaluates each Presentation Context independently, and accepts any Presentation Context that matches an Abstract Syntax for any Real-World Activity.

2.3.1.3.4.4 Transfer Syntax Selection Policies

The transfer syntax selection policy is the following:

- Only the following transfer syntaxes are accepted: Implicit VR Little Endian (1.2.840.10008.1.2), Explicit VR Little Endian (1.2.840.10008.1.2.1), Explicit VR Big Endian (1.2.840.10008.1.2.2)
- Among all the remaining proposed transfer syntaxes, the explicit transfer syntaxes are chosen first.
- Among all the remaining proposed transfer syntaxes, the little endian transfer syntaxes are chosen first.

2.3.1.3.5 Real-World Activity: Verify connectivity

The DICOM SERVER AE rejects the association if they are too many open connections.

2.3.1.3.5.1 Associated Real-World Activity

The Real-World Activity associated with the DICOM Ping from remote host operation is to check the status of the DICOM SERVER AE.

2.3.1.3.5.2 Accepted Presentation Context Table

Acceptable Presentation Contexts for DICOM SERVER AE and Real-World Activity Verify connectivity from remote node.

Presentation Context Table by DICOM SERVER AE for Activity Verify connectivity from remote node – Accepted					
Abstract Syntax		**Transfer Syntax Group**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

2.3.1.3.5.3 Presentation Context Acceptance Criterion

The DICOM SERVER AE evaluates each Presentation Context independently, and accepts any Presentation Context that matches an Abstract Syntax for any Real-World Activity.

2.3.1.3.5.4 Transfer Syntax Selection Policy

Within each Presentation Context, the DICOM SERVER AE will select Transfer Syntaxes according to the following priority (highest priority first):

1. Explicit VR Little Endian
2. Explicit VR Big Endian
3. Implicit VR Little Endian

2.3.2 DICOM Print SCU AE Specification

This Application Entity provides Standard Conformance to the following DICOM SOP Classes as an SCU:

SOP Class Name	SOP Class UID
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18

Note: Support of the Basic Grayscale Print Management Meta SOP Class as an SCU mandates support for the Basic Film Session, Basic Film Box, Basic Grayscale Image Box and Printer SOP Classes as an SCU.

Note: Support of the Basic Color Print Management Meta SOP Class as an SCU mandates support for the Basic Film Session, Basic Film Box, Basic Color Image Box and Printer SOP Classes as an SCU.

2.3.2.1 Association Establishment Policies

2.3.2.1.1 General

The DICOM Application Context Name (ACN) that is always proposed is:

Application Context Name	1.2.840.10008.3.1.1.1

The Maximum Length PDU negotiation is included in all association establishment requests.

The maximum length PDU for an association initiated by the DICOM Print SCU is:

Maximum Length PDU	28672 Bytes

The Print Management Service Class does not support extended negotiation.

The user information Items sent by this product are:

- Maximum PDU Length
- Implementation UID

Note: The Maximum length PDU is not configurable

2.3.2.1.2 Number of Associations

The DICOM Print SCU AE supports only one association at a time. The printing requests are internally queued.

2.3.2.1.3 Asynchronous Nature

Asynchronous mode is not supported. All operations will be performed synchronously.

2.3.2.1.4 Implementation Identifying Information

The Implementation UID for this DICOM Implementation is:

AW Pioneer Filmer Implementation UID	**1.2.840.113619.6.375**

2.3.2.2 Association Initiation Policy

2.3.2.2.1 Real-World Activity "Manual Image Print"

2.3.2.2.1.1 Associated Real-World Activity

The user has the possibility to drag and drop images from Volume Viewer applications to the FILMER application. When the user requests for a print by pushing the "Print" button, the DICOM Print SCU tries to establish the association with the requested printer and sends the images for printing.

Note: The Print Builder application allows to select different REMOTE DICOM printers and to manipulate some print parameters like the number of copies.

Note: The Service Tools manage the declaration and suppression of REMOTE DICOM printers.

2.3.2.2.1.2 Proposed Presentation Context Table

Presentation Context Table – Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.3.2.2.1.2.1 SOP Specific DICOM Conformance Statement for Print Management SOP Classes

The DICOM Print SCU AE initiates one association with the selected REMOTE DICOM Printer. The DICOM Print SCU AE will not open another association while the current one is active.

The Basic Grayscale Print Management Meta SOP Class and the Color Grayscale Print Management Meta SOP Class are never negotiated simultaneously.

For each of the supported Print Management SOP and Meta SOP Classes, the optional attributes and service elements supported, the valid range of values for mandatory and optional attributes, and the status code behavior are described in Section 10.

2.3.2.2.2 Real-World Activity "Direct Image Print"

2.3.2.2.2.1 Associated Real-World Activity

The user has the possibility to directly send images from Volume Viewer applications to the Print Builder application. The Print Builder application will launch the DICOM Print SCU that tries to establish the association with the default printer and sends the images for printing.

2.3.2.2.2.2 Proposed Presentation Context Table

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.3.2.2.2.2.1 SOP Specific DICOM Conformance Statement for Print Management SOP Classes

The DICOM Print SCU AE initiates one association with the selected REMOTE DICOM Printer. The DICOM Print SCU AE will not open another association while the current one is active.

The Basic Grayscale Print Management Meta SOP Class and the Color Grayscale Print Management Meta SOP Class are never negotiated simultaneously.

For each of the supported Print Management SOP and Meta SOP Classes, the optional attributes and service elements supported, the valid range of values for mandatory and optional attributes, and the status code behavior are described in Chapter 10.

2.4 COMMUNICATION PROFILES

2.4.1 Supported Communication Stacks

The DICOM Upper Layer Protocol is supported using TCP/IP, as specified in DICOM PS3.8.

2.4.2 The TCP/IP stack is inherited from the SUSE Operating System.Physical Media Support

The product is provided with a 100 Mb/s Ethernet interface. Additional or alternate network interfaces may be available.

Note: For more information about the Physical Media available for AW Pioneer, please refer to the Product Data Sheet.

2.4.3 Additional Protocols

AW Pioneer Platform does not support DHCP protocol.

2.4.4 IPv4 and IPv6 Support

Only IPv4 supported.

2.5 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

2.5.1 Standard Extended /Specialized/Private SOPs

2.5.1.1 Extended Enhanced SR object

The extension of this SOP Class is described in section 6

The Enhanced DICOM SR implements the private ELECTRONIC FILM TID. Refer to section 6.

2.5.2 Private Transfer Syntaxes

No private Transfer Syntax is negotiated.

2.6 CONFIGURATION

2.6.1 AE Title/Presentation Address Mapping

The GE Field Engineer must configure the hostname of the station during installation. The hostname will then be used for the AET address mapping.

The local DICOM SERVER AE Title is set to the first 16 bytes of the hostname.

DICOM SERVER AE

The Local AE Title is set to hostname.

DICOM PRINT SCU AE

The local DICOM Print SCU AE Title is: "PR_Hostname" where Hostname is the system hostname defined at installation. The default AET PR_Hostname can be overwritten by GE Field Engineer if the length of Local DICOM Print SCU AE Title exceeds 16 characters.

2.6.2 Configurable Parameters

The following fields are configurable for the DICOM SERVER AE (local):

- Local AE Title
- Local IP Address (defined by the station)
- Local IP Netmask (defined by the station)

The Local Listening Port Number is not configurable and set to **4006**.

The following fields are configurable for every remote DICOM AE:

- Remote AE Title
- Remote IP Address
- Listening TCP/IP Port Number

A **default router** IP Address for **all remote nodes** can be configured as well as some specific routes.

The following fields are configurable:

- Association Establishment Timer
- Store, Find, Move, Timers
- Inactivity Timers
- Maximum Length PDU

The following fields are configurable for the **storage commitment**:

- STC Host name
- STC AE title
- STC TCP/IP address
- STC Port

The following fields are configurable for the DICOM PRINT SCU AE (local):

~sdc/AIA/bin/configure.printAET

- Local AE Title

Note: The Local IP address and the local IP netmask are the ones of the workstation

Note: No local Port Number is defined because the product is never responding to an association request.

The following fields are configurable for every remote DICOM AE:

- Remote AE Title
- Remote IP Address
- Listening TCP/IP Port Number

The Service Tools allow the administrator to add, delete, or update the Remote DICOM Printers parameters described above.

A default router IP Address for all DICOM remote nodes (including printers, Storage SCP Workstations…) can be configured as well as some specific routes.

The following fields are configurable:

- Message report timeout (default=60s)
- Event report timeout (default=3600s)

- Maximum PDU Length

The GE Field Engineer can update this configuration.

Only one association can be performed at a time by this implementation.

Note: A GE Field Engineer must perform all configurations.

2.7 SUPPORT OF EXTENDED CHARACTER SETS

The AW Pioneer will support fully only the ISO_IR 100 (ISO 8859-1:1987 Latin alphabet N 1. supplementary set) as extended character sets.

For other extended character sets they will be supported for DICOM data exchange and in the database. But applications, which will load and manipulate these data, may have a restrictive behavior.

2.8 CODES AND CONTROLLED TERMINOLOGY

The product uses coded terminology in SR (Structure Report objects) and KO (Key Object Selection object).

2.9 SECURITY PROFILES

The product does not conform to any defined DICOM Security Profiles.

It is assumed that the product is used within a secured environment. It is assumed that a secured environment includes at a minimum:

1. Firewall or router protections to ensure that only approved external hosts have network access to the product.
2. Firewall or router protections to ensure that the product only has network access to approved external hosts and services.

Any communications with external hosts and services outside the locally secured environment use appropriate secure network channels (such as a Virtual Private Network (VPN))

3. MEDIA STORAGE CONFORMANCE STATEMENT

3.1 INTRODUCTION

This section of the DICOM conformance statement specifies the AW Pioneer system compliance to DICOM requirements for **Media Interchange**. It details the DICOM Media Storage Application Profiles and roles that are supported by this product.

The AW Pioneer system provides capabilities to DICOM Media Interchange on CD (Compact Disc), DVD (Digital Video Disc –Recordable) and USB Storage device with VFAT file system. The system works with most of the IOD's like Computed Tomography (CT), Magnetic Resonance (MR), Positron Emission Tomography (PET), and Digital X-Ray images.

3.2 IMPLEMENTATION MODEL

3.2.1 Application Data Flow Diagram

The media interchange application model for the AW Pioneer system is shown in the following Illustration:

The DICOM Media Interchange Application Entity (AE) handles the DICOM CREATE/RESTORE functionality for the CD/DVD and USB storage media. The DICOM Media Interchange AE is commanded by the user to perform DICOM services operating on the DICOM media through the use of buttons and menu selections on the graphical user interface of the platform.

The user requests the creation of a DICOM File Set and the writing of this DICOM File Set on blank Interchange Media by selecting images in the local Browser and selecting the Interchange Media as being the selected device. Then, the iso9660 image of the CD/DVD to burn will be generated. Once the generation has been done, it burns the complete set of data on the selected Interchange Media. For USB Storage media with VFAT file system, DICOM File Set is copied to blank Interchange media.

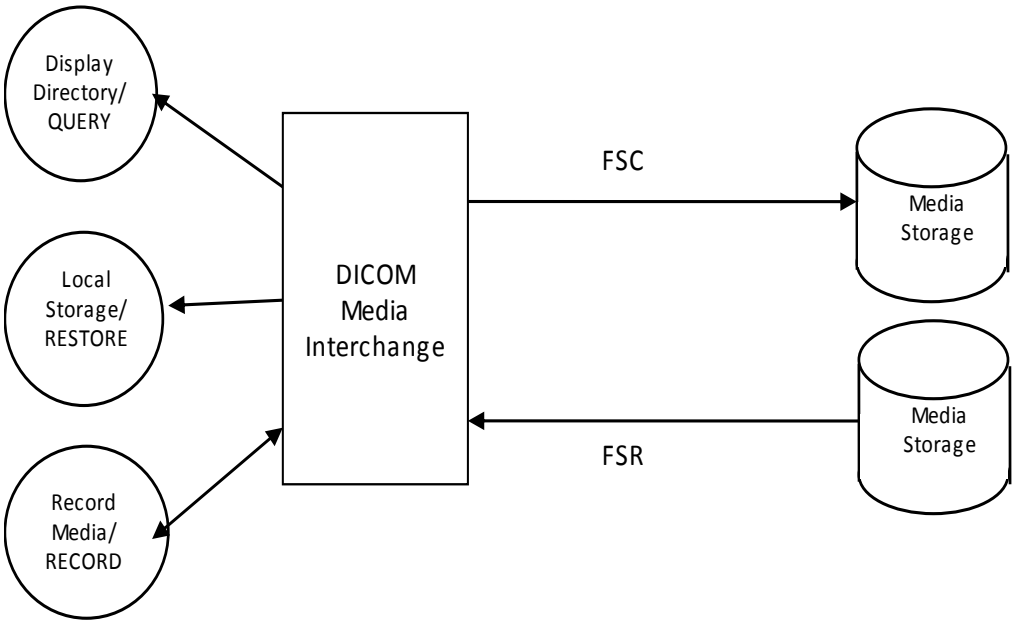


FIGURE 3–1 AW PIONEER SYSTEM MEDIA INTERCHANGE APPLICATION MODEL AND DATA FLOW DIAGRAM

The DICOM Media Interchange AE has a local storage that may contain various SOP instances. These may have been obtained by original creation, network (DICOM or proprietary) or by removable media using other application entities. These instances are external to this conformance claim and the origin of SOP instances is outside the scope of this claim.

The Media Creator initializes Media by acting as an FSC to create a new DICOM File-set on a 700MB CD/4.7GB DVD/USB Storage(no size limit) blank Interchange Media. It initializes the DICOM File-set and writes all the specified SOP instances onto the Interchange Media at once. The SOP instances written will be limited to instances that match the criteria of one of the Application Profiles that is supported. Updating the media is not supported.

The DICOM Media Interchange AE acts as an FSR when requested to browse the Interchange Media such that user can select the SOP instances that he wants the DICOM Media Interchange AE to copy on the local database by selecting appropriate Study/Series/Image instances.

The supported file system during creation and restore are listed below:

TABLE 3.2.1-1

File System	Supported during Media Create (FSC)	Supported during Media Restore (FSR)
ISO 9660	YES	YES
UDF	NO	YES
VFAT	YES	YES

The supported media during creation and restore are listed below:

TABLE 3.2.1-2

Media	Supported during Media Create (FSC)	File System supported (FSC)	Supported during Media Restore (FSR)	File System supported (FSR)
CD -R	YES	ISO 9660	YES	ISO 9660
CD -RW	YES	ISO 9660	YES	ISO 9660

DVD -R	YES	ISO 9660	YES	ISO 9660 & UDF
DVD -RW	YES	ISO 9660	YES	ISO 9660 & UDF
DVD+R	NO	ISO 9660	YES	ISO 9660 & UDF
DVD+RW	NO	ISO 9660	YES	ISO 9660 & UDF
DVD-ROM	NO	ISO 9660	YES	ISO 9660 & UDF
USB Storage (VFAT file system)	YES	VFAT	YES	VFAT

3.2.2 Functional Definition of AE's

The DICOM Media Interchange AE supports the following functions:

- Generate and write a DICOM File Set (FSC) in a one shot activity. (SAVE).
- Read a DICOM File Set (FSR) on an Interchange Media (QUERY).
- It can copy SOP instances from the media onto local storage. (RESTORE).

3.2.3 Sequencing of Real-World Activities

Not Applicable.

3.2.4 File Meta Information Options (See PS3.10)

The File Meta-Information for this implementation is :

Source Application Entity Title	If present in composite object instances it will be set to same value, otherwise not present
File Meta-Information Version	**1**
Implementation UID	**1.2.826.0.1.3680043.2.60.0.1**
Implementation Version Name	**MEDIACREATOR_V1**

3.3 AE SPECIFICATIONS

3.3.1 DICOM Storage Media (CD /DVD /USB Storage) Interchange AE Specification

The DICOM CD/DVD/USB Storage Media AE provides standard conformance to DICOM Media Interchange Option of the Media Storage Service Class. The supported Application Profiles and roles are listed below.

TABLE 3.3.1-1 SUPPORTED APPLICATION PROFILES AND ROLES

Supported Application Profile	Real World Activity	Role
STD-GEN-CD	CREATE CD	FSC
STD-GEN-CD	QUERY CD	FSR
STD-GEN-CD	RESTORE CD	FSR
STD-GEN-DVD-JPEG	CREATE DVD	FSC
STD-GEN-DVD-JPEG	QUERY DVD	FSR
STD-GEN-DVD-JPEG	RESTORE DVD	FSR*
STD-GEN-USB-JPEG	CREATE USB	FSC
STD-GEN-USB-JPEG	QUERY USB	FSR
STD-GEN-USB-JPEG	RESTORE USB	FSR*

* Only following Transfer Syntaxes are supported by FSR during RESTORE DVD & RESTORE USB real world activity

TABLE 3.3.1-2 DVD / USB RESTORE TRANSFER SYNTAXES

Transfer Syntax UID	Transfer Syntax Name
1.2.840.10008.1.2.4.50	JPEG Baseline
1.2.840.10008.1.2.4.70	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14[Selection Value 1])
1.2.840.10008.1.2.5	RLE Lossless

3.3.1.1 File Meta Information for the DICOM Media Interchange AE

Refer to section 3.2.4.

3.3.1.2 Real-World Activities for the DICOM Media Interchange AE

3.3.1.2.1 Real-World Activity Create (Generate and Write) CD/DVD/USB Storage

The DICOM Media Interchange AE acts as an FSC using the interchange option when requested to copy SOP Instances from the local database to a CD /DVD /USB Storage.

The user selects the entries in the local database that he/she wants the DICOM Media Interchange AE to copy onto Interchange Media.

The graphic interface allows the user to select the entries (studies, series or images) in the local database to be copied onto to the selected Interchange Media.

The DICOM Media Interchange AE creates one File Set per generated Interchange Media.

- A user can only create one copy of CD/DVD/USB image for a drive at a time; any other attempt of creation will not be allowed until the first one is complete or cancelled.
- A user cannot create CD/DVD/USB while restore CD/DVD/USB is in process.
- A DICOM Media Viewer is provided along with the selected object instances on the interchange media. This viewer can be loaded on a standard PC running Windows XP, Windows Vista or Windows 7.

Before writing on the Interchange Media, the DICOM Media Interchange AE checks for the following condition:

The inserted media is blank and write-able. If the condition is not met, an error is displayed and the user needs to replace it with a blank media.

Following are the SOP Classes supported by this AE. All SOP Instances use the Explicit VR Little Endian Uncompressed Transfer Syntax, UID 1.2.840.10008.1.2.1.

TABLE 3.3.1.2-1 SOP CLASSES SUPPORTED BY ACTIVITY *CREATE CD/DVD/USB STORAGE*

SOP Class	SOP Class UID
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6

X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
GEMS PET Raw Information Storage	1.2.840.113619.4.30

3.3.1.2.1.1 Application Profile for the RWA Create CD/DVD/USB Storage

Refer to Sec 3.3.1 for the list of Application Profiles that invoke this AE for the Create CD/DVD/USB Storage RWA.

3.3.1.2.1.1.1 Options for STD-GEN-CD Application Profile:

Refer Table **3.3.1.2-1** for SOP Classes supported by this AE.

Common DICOMDIR Directory Records created by this AE will include key attributes as described in Section 9 Basic Directory Information Object Implementation**Error! Reference source not found.**.

The following additional DICOMDIR keys are supported for this profile in IMAGE Directory Records.

TABLE 3.3.1.2-2 ADDITIONAL DICOMDIR KEYS FOR STD-GEN-CD

Key Attribute	Tag	Directory Record Type	Type	Notes
Image Type	(0008,0008)	IMAGE	1C	If prese nt in composite object instances it will be set to same value, otherwise an error is returned.
Referenced Image Sequence	(0008,1140)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise an error is returned.
> Referenced SOP Class UID	(0008,1150)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise an error is returned.
> Referenced SOP Instance UID	(0008,1155)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise an error is returned.
Rows	(0028,0010)	IMAGE	3	If present in composite object instances it will be set to same value, otherwise not stored.
Columns	(0028,0011)	IMAGE	3	If present in composite object instances it will be set to same value, otherwise not stored.
Frame of Reference UID	(0020,0052)	IMAGE	3	If present in composite object instances it will be set to same value, otherwise not stored.
Image Position Patient	(0020,0032)	IMAGE	3	If present in composite object instances it will be set to same value, otherwise not stored.
Image Orientation Patient	(0020,0037)	IMAGE	3	If present in composite object instances it will be set to same value, otherwise not stored.
Pixel Spacing	(0028,0030)	IMAGE	3	If present in composite object instances it will be set to same value, otherwise not stored.

3.3.1.2.1.1.2 Options for STD-GEN-DVD-JPEG Application Profile

Refer Table **3.3.1.2-1** for SOP Classes supported by this AE.

Common DICOMDIR Directory Records created by this AE will include key attributes as described in Section 9 Basic Directory Information Object Implementation**Error! Reference source not found.**.

Following are the Additional DICOMDIR Keys supported for this profile:

TABLE 3.3.1.2-3 ADDITIONAL DICOMDIR KEYS FOR STD-GEN-DVD-JPEG

Key Attribute	Tag	Directory Record Type	Type	Notes
Patient's Birth Date	(0010,0030)	PATIENT	1C	If present in composite object instances it will be set to same value, otherwise not present
Patient's Sex	(0010,0040)	PATIENT	1C	If present in composite object instances it will be set to same value, otherwise not present
Institution Name	(0008,0080)	SERIES	1C	If present in composite object instances it will be set to same value, otherwise not sent
Institution Address	(0008,0081)	SERIES	1C	If present in composite object instances it will be set to same value, otherwise not sent
Performing Physician's Name	(0008,1050)	SERIES	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Type	(0008,0008)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Calibration Image	(0050,0004)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Referenced Image Sequence	(0008,1140)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
> Referenced SOP Class UID	(0008,1150)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
> Referenced SOP Instance UID	(0008,1155)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Lossy Image Compression Ratio	(0028,2112)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Rows	(0028,0010)	IMAGE	1	If present in composite object instances it will be set to same value, otherwise an error is returned
Columns	(0028,0011)	IMAGE	1	If present in composite object instances it will be set to same value, otherwise an error is returned
Frame of Reference UID	(0020,0052)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Synchronization Frame of Reference UID	(0020,0200)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Number of Frames	(0028,0008)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Acquisition Time Synchronized	(0018,1800)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Acquisition DateTime	(0008,002A)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Position (Patient)	(0020,0032)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Orientation (Patient)	(0020,0037)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent

Pixel Spacing	(0028,0030)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent

3.3.1.2.1.1.3 Options for STD-GEN-USB-JPEG Application Profile

Refer Table **3.3.1.2-1** for SOP Classes supported by this AE.

Common DICOMDIR Directory Records created by this AE will include key attributes as described in Section 9 Basic Directory Information Object Implementation**Error! Reference source not found.**.

Following are the Additional DICOMDIR Keys supported for this profile:

TABLE 3.3.1.2-4 ADDITIONAL DICOMDIR KEYS FOR STD-GEN-USB-JPEG

Key Attribute	Tag	Directory Record Type	Type	Notes
Patient's Birth Date	(0010,0030)	PATIENT	1C	If present in composite object instances it will be set to same value, otherwise not sent
Patient's Sex	(0010,0040)	PATIENT	1C	If present in composite object instances it will be set to same value, otherwise not sent
Institution Name	(0008,0080)	SERIES	1C	If present in composite object instances it will be set to same value, otherwise not sent
Institution Address	(0008,0081)	SERIES	1C	If present in composite object instances it will be set to same value, otherwise not sent
Performing Physician's Name	(0008,1050)	SERIES	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Type	(0008,0008)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Calibration Image	(0050,0004)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Referenced Image Sequence	(0008,1140)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
> Referenced SOP Class UID	(0008,1150)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
> Referenced SOP Instance UID	(0008,1155)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Lossy Image Compression Ratio	(0028,2112)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Rows	(0028,0010)	IMAGE	1	If present in composite object instances it will be set to same value, otherwise an error is returned
Columns	(0028,0011)	IMAGE	1	If present in composite object instances it will be set to same value, otherwise an error is returned
Frame of Reference UID	(0020,0052)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Synchronization Frame of Reference UID	(0020,0200)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Number of Frames	(0028,0008)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent

Acquisition Time Synchronized	(0018,1800)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Acquisition DateTime	(0008,002A)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Position (Patient)	(0020,0032)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Orientation (Patient)	(0020,0037)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent
Pixel Spacing	(0028,0030)	IMAGE	1C	If present in composite object instances it will be set to same value, otherwise not sent

3.3.1.2.2 Real-World Activity Display CD/DVD/USB Storage Directory – QUERY

The DICOM Media Interchange AE acts as an FSR using the interchange option when requested to browse the Interchange Media.

When the DICOM Media Interchange AE is requested to provide a directory listing, it reads the File-set and displays the DICOMDIR directory entries, according to the STUDY Root paradigm.

If the media is not blank, then Interchange Media gets mounted. To remove the media, the user has to select the eject button on user interface for the appropriate drive.

A user cannot display the directory when create/restore CD/DVD/USB is in progress.

3.3.1.2.2.1 Application Profile for the RWA Display CD/DVD/USB Storage Directory

For the list of Application Profiles that invoke this AE for the Display Directory CD/DVD/USB Storage RWA, see the TABLE 3.3.1-1.

3.3.1.2.2.1.1 Options for STD-GEN-CD/STD-GEN-DVD-JPEG/STD-GEN-USB-JPEG Application Profile

Common DICOMDIR Directory Records read by this AE will include key attributes as described in Section 9 Basic Directory Information Object Implementation**Error! Reference source not found.**.

Following are the SOP Classes supported by the RWA "Display Directory of CD/DVD/USB Storage.

TABLE 3.3.1.2-5 SOP CLASSES SUPPORTED BY ACTIVITY *DISPLAY CD/DVD/USB STORAGE DIRECTORY*

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Media Storage Directory Storage	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1

Refer Sections 3.3.1.2.1.1.1, 3.3.1.2.1.1.2 and 3.3.1.2.1.1.3 for the additional DICOMDIR keys, which are read (if present).

3.3.1.2.3 Real-World Activity Restore CD/DVD/USB Storage Directory

The DICOM Media (CD/DVD /USB Storage) Interchange AE acts as an FSR using the interchange option when requested to copy SOP instances from the CD/DVD/USB to the local database.

The user selects the SOP instances that he wants the DICOM Media Interchange AE to copy on the local database by selecting appropriate Study/Series/Image instances and clicking on the suitable restore buttons. Once selected, the SOP instances are copied from the media to the local database.

If the media is not blank, then the Interchange Media gets mounted. To remove the media, the user has to select the eject button on the User Interface for the appropriate drive.

A user cannot restore CD/DVD/USB while create CD/DVD/USB is in process.

A user can only restore selected composite objects at a time from a media; any other attempt of selections to restore CD/DVD/USB on media in same drive will wait until the first one is completed.

3.3.1.2.3.1 Application Profile for the RWA Restore CD/DVD/USB Storage Directory

For the list of Application Profiles that invoke this AE for the Display Directory CD/DVD/USB Storage RWA, see the TABLE 3.3.1-1.

3.3.1.2.3.1.1 Options for STD-GEN-CD/STD-GEN-DVD-JPEG/STD-GEN-USB-JPEG Application Profile

Common DICOMDIR Directory Records read by this AE will include key attributes as described in Section 9 Basic Directory Information Object Implementation**Error! Reference source not found.**.

- Following are the SOP Classes supported by the RWA Restore CD/DVD/USB Storage.

TABLE 3.3.1.2-6 SOP CLASSES SUPPORTED BY ACTIVITY *RESTORE CD/DVD/USB STORAGE DIRECTORY*

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Media Storage Directory Storage	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
See Table 3.3.1.2-1	See Table 3.3.1.2-1	Explicit VR Little Endian	1.2.840.10008.1.2.1
See Table 3.3.1.2-1	See Table 3.3.1.2-1	JPEG Lossless Process 14 (selection value 1)	1.2.840.10008.1.2.4.70
See Table 3.3.1.2-1	See Table 3.3.1.2-1	JPEG Lossy, Baseline Sequential with Huffman Coding (Process 1)	1.2.840.10008.1.2.4.50
See Table 3.3.1.2-1	See Table 3.3.1.2-1	JPEG Extended (Process 2 & 4): Default Transfer Syntax for Lossy JPEG 12 Bit Image Compression (Process 4 only)	1.2.840.10008.1.2.4.51

3.4 AUGMENTED AND PRIVATE APPLICATION PROFILES

No augmented/private profile is implemented.

3.5 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

None.

3.6 CONFIGURATION

None

3.7 SUPPORT OF EXTENDED CHARACTER SETS

The DICOM Media Interchange AE will support copy of SOP instances containing the ISO IR 100 (Latin alphabet No. 1, supplementary set) and DICOM default character sets as defined in PS3.5.

4. STORAGE COMMITMENT PUSH MODEL IMPLEMENTATION

4.1 STORAGE COMMITMENT PUSH MODEL INFORMATION OBJECT DEFINITION

Please refer to DICOM Part 3 (Information Object Definitions) for a description of each of the attributes contained within the Storage Commitment Information Object.

The Storage Commitment Information Object is used both for N-ACTION Storage Commitment Requests by the SCU and N-EVENT-REPORT Storage Commitment Notifications by the SCP.

4.1.1 Storage Commitment Module for N-ACTION

TABLE 4-1 STORAGE COMMITMENT MODULE FOR N-ACTION

Attribute Name	Tag	SCU Use
Transaction UID	(0008,1195)	Uses the UID generation service provided by the platform, the algorithm depends on the • UID root of the product (1.2.840.113619.2.362) • MAC Address of the workstation • Unix Process identifier • Date and time.
Storage Media File-Set ID	(0088,0130)	Not supported
Storage Media File-Set UID	(0088,0140)	Not supported
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
>Storage Media File-Set ID	(0088,0130)	Not supported
>Storage Media File-Set UID	(0088,0140)	Not supported

4.1.2 Storage Commitment Module for N-EVENT-REPORT

TABLE 4-2 STORAGE COMMITMENT MODULE FOR N-EVENT-REPORT

Attribute Name	Tag	SCU Use
Transaction UID	(0008,1195)	Value received from SCP
Retrieve AE Title	(0008,0054)	Not used
Storage Media File-Set ID	(0088,0130)	Not used
Storage Media File-Set UID	(0088,0140)	Not used

Referenced SOP Sequence	(0008,1199)	Success of storage commitment is registered in the database. If images are removed in the meanwhile the report is ignored.
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
>Retrieve AE Title	(0008,0054)	Not used.
>Storage Media File-Set ID	(0088,0130)	Not used
>Storage Media File-Set UID	(0088,0140)	Not used
Failed SOP Sequence	(0008,1198)	Failure and reason is logged. A general failure is reported to the user.
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
>Failure Reason	(0008,1197)	See Section 4.1.2.1 for the list of processed values.

4.1.2.1 Processing of Failure Reason when received in a N-Event-Report

When receiving a N-Event-Report request with a Event Type ID equal to 2, meaning that Storage Commitment is complete, but failure exists, following is the set of value that this Storage Commitment SCU AE is able to process.

Failure Reason	Meaning	Application Behavior When Receiving Reason Code
0110H	Processing failure	Failure and reason is logged. A general failure is reported to the user.
0112H	No such object instance	
0213H	Resource limitation	
0122H	Referenced SOP Class not supported	
0119H	Class / Instance conflict	
0131H	Duplicate transaction UID	
*	Other Failure Reason code values	

5. SECONDARY CAPTURE INFORMATION OBJECT IMPLEMENTATION

5.1 INTRODUCTION

This section specifies the use of the DICOM SC Image IOD to represent the information included in SC images produced by this implementation. Corresponding attributes are conveyed using the module construct.

In the following chapter, all new study, series and image instance UID are generated from base UID:

- for AW Pioneer Filmer: **1.2.840.113619.2.375**
- for AW Pioneer 2D Multi-Modality Viewer: **1.2.840.113619.2.376**

This chapter covers only the secondary captures generated by the Filmer application and 2D Multi-Modality Viewer. For other applications running onto AWP platform, please refer to the according DICOM conformance statement.

In the Filmer workflow, each secondary capture DICOM field will be filled with value present in the original image, except when a specific rule is applied and described in this chapter.

In the Viewer workflow, each secondary capture DICOM field (Screen Save image) will be filled with value present in the original image, except when a specific rule is applied and described in this chapter.

5.2 AW PIONEER MAPPING OF DICOM ENTITIES

The AW Pioneer maps DICOM Information Entities to local Information Entities in the product's database and user interface.

TABLE 5.2-1
MAPPING OF DICOM ENTITIES TO AW PIONEER ENTITIES

DICOM	AW Pioneer Entity
Patient	Patient
Study	Exam
Series	Series
Equipment	Equipment
Image	Image

5.3 IOD MODULE TABLE

Within an entity of the DICOM SC IOD, attributes are grouped into related set of attributes. A set of related attributes is termed a module. A module facilitates the understanding of the semantics concerning the attributes and how the attributes are related with each other. A module grouping does not infer any encoding of information into datasets.

Table 6.3-1 identifies the defined modules within the entities that comprise the DICOM SC IOD. The modules are identified by their Module Name.

See DICOM Part 3 for a complete definition of the entities, modules, and attributes.

TABLE 5.3-1 SC IMAGE IOD MODULES

Entity Name	Module Name	Usage	Reference
Patient	Patient	Used	**5.4.1.1**
	Clinical Trial Subject	Not used	N/A
Study	General Study	Used	**5.4.2.1**
	Patient Study	Used	**5.4.2.2**
	Clinical Trial Study	Not used	N/A
Series	General Series	Used	**5.4.3.1**
	Clinical Trial Series	Not used	N/A
Equipment	General Equipment	Used	**5.4.4.1**
	SC Equipment	Used	**5.4.4.2**
Image	General Image	Used	**5.4.5.1**
	Image Pixel	Used	**5.4.5.2**
	Device	Not used	N/A
	SC Image	Used	**5.4.5.3**
	Overlay Plane	Not used	N/A
	Modality LUT	Used	**5.4.5.5**
	VOI LUT	Used	**5.4.5.6**
	SOP Common	Used	**5.4.5.7**

5.4 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the SC Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained from. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions).

Note: Elements not listed are not supported

5.4.1 Patient Entity Modules

5.4.1.1 Patient Module

This section specifies the Attributes of the Patient that describe and identify the Patient who is the subject of a diagnostic Study. This Module contains Attributes of the patient that are needed for diagnostic interpretation of the Image and are common for all studies performed on the patient.

A Screen Save image is a DICOM Secondary Capture generated by AW Pioneer Filmer application.

TABLE 5.4-1
PATIENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	Viewer Original Filmer Original if No Mix Mode or Mix Mode = Study User defined if Mix Mode = Patient
Patient ID	(0010,0020)	2	Viewer Original Filmer Original if No Mix Mode or Mix Mode = Study Function of pid and time if Mix Mode = Patient
Issuer of Patient ID	(0010,0021)	3	Not filled
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	3	Not filled
Patient's Birth Date	(0010,0030)	2	Viewer Original Filmer Original if No Mix Mode or Mix Mode = Study Empty if Mix Mode = Patient
Patient's Sex	(0010,0040)	2	Viewer Original Filmer Original if No Mix Mode or Mix Mode = Study Empty if Mix Mode = Patient
Other Patient IDs	(0010,1000)	3	Not filled
Other Patient Ids Sequence	(0010,1002)	3	Not filled

5.4.2 Study Entity Modules

The following Study IE Modules are common to all Composite Image IODs, which reference the Study IE. These Modules contain Attributes of the patient and study that are needed for diagnostic interpretation of the image.

5.4.2.1 General Study Module

This section specifies the Attributes, which describe and identify the Study performed upon the Patient.

TABLE 5.4-2
GENERAL STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Notes
Study Instance UID	(0020,000D)	1	Viewer Original Filmer Original if No Mix Mode Generated if Mix Mode = Patient or Mix Mode = Study
Study Date	(0008,0020)	2	Viewer Original (Empty if does not exist) Filmer Original (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Study Time	(0008,0030)	2	Viewer Original (Empty if does not exist) Filmer Original (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Referring Physician's Name	(0008,0090)	2	Viewer Original (Empty if does not exist) Filmer Original (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Study ID	(0020,0010)	2	Viewer Original (Empty if does not exist) Filmer Original (Empty if does not exist) if No Mix Mode Generated if Mix Mode = Patient or Mix Mode = Study

Accession Number	(0008,0050)	2	Viewer Original (Empty if does not exist) Filmer Original (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Study Description	(0008,1030)	3	Viewer Original (Empty if does not exist) Filmer Original (Empty if does not exist) if No Mix Mode User defined if Mix Mode = Patient or Mix Mode = Study

5.4.2.2 Patient Study Module

This section defines Attributes that provide information about the Patient at the time the Study was performed.

TABLE 5.4-3
PATIENT STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Patient's Age	(0010,1010)	3	Viewer Original Filmer Original if No Mix Mode Not present if Mix Mode = Patient or Mix Mode = Study
Patient's Size	(0010,1020)	3	Viewer Original Filmer Original if No Mix Mode Not present if Mix Mode = Patient or Mix Mode = Study
Patient's Weight	(0010,1030)	3	Viewer Original Filmer Original if No Mix Mode Not present if Mix Mode = Patient or Mix Mode = Study

5.4.3 Series Entity Modules

The following Series IE Modules are common to all Composite Image IODs, which reference the Series IE.

5.4.3.1 General Series Module

This section specifies the Attributes that identify and describe general information about the Series within a Study.

TABLE 5.4-4
GENERAL SERIES MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	Viewer Original Filmer • Original if all Filmer data have the same defined modality • OT (Other) otherwise
Series Instance UID	(0020,000E)	1	Generated
Series Number	(0020,0011)	2	Generated
Series Description	(0008,103E)	3	Viewer • For XA image, when the secondary capture image is generated per original image, the series description is set to the secondary capture image comments if valued: (0020,4000) • "SCREEN SAVE" otherwise Filmer User defined (AW Electronic film by default)
Operator's Name	(0008,1070)	3	Name of the current user logged on the station.
Series Date	(0008,0021)	3	Not present
Series Time	(0008,0031)	3	Not present

5.4.4 Equipment Entity Modules

The following Equipment IE Module is common to all Composite Image IODs that reference the Equipment IE.

5.4.4.1 General Equipment Module

This section specifies the Attributes that identify and describe the piece of equipment that produced a Series of Images.

TABLE 5.4-5
GENERAL EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	Viewer Derived from original image Filmer Derived from original image if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Institution Name	(0008,0080)	3	Viewer Derived from original image Filmer Derived from original image if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Institution Address	(0008,0081)	3	Viewer Derived from original image Filmer Derived from original image if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Station Name	(0008,1010)	3	Host name provided on the platform
Manufacturer's Model Name	(0008,1090)	3	Derived from original image
Software Versions	(0018,1020)	3	Derived from original image

5.4.4.1.1 General Equipment Attribute Descriptions

5.4.4.1.1.1 Pixel Padding Value

Not present

5.4.4.2 SC Equipment Module

This Module describes equipment used to convert images into a DICOM format.

TABLE 5.4-6
SC IMAGE EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Conversion Type	(0008,0064)	1	WSD
Modality	(0008,0060)	3	Original if Screen Save Image Original if all Filmer data have the same defined modality, OT otherwise
Secondary Capture Device ID	(0018,1010)	3	Real station host name
Secondary Capture Device Manufacturer	(0018,1016)	3	GE MEDICAL SYSTEMS
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	3	Filmer FILMER_3.0 Viewer / AngioViz VIEWER_3.0
Secondary Capture Device Software Version	(0018,1019)	3	Software version build identifier

5.4.5 Image Entity Modules

The following Image IE Modules are common to all Composite Image IODs that reference the Image IE.

5.4.5.1 General Image Module

This section specifies the Attributes that identify and describe an image within a particular series.

TABLE 5.4-7
GENERAL IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	Generated
Patient Orientation	(0020,0020)	2C	Empty
Content Date	(0008,0023)	2C	Derived from original image
Content Time	(0008,0033)	2C	Derived from original image
Image Type	(0008,0008)	3	See 5.4.5.1.1.1.
Source image Sequence	(0008,2112)	3	Viewer Set in Screen save image created by AW Pioneer 2D Multi-Modality Viewer Filmer Defined by the application that sends the image to the Filmer
>Referenced SOP Class UID	(0008,1150)	1C	Defined by the application that sends the image to the Filmer
>Referenced SOP Instance UID	(0008,1155)	1C	Defined by the application that sends the image to the Filmer
Burned In Annotation	(0028, 0301)	3	YES
Image Comment	(0020,4000)	3	Defined by the application.

5.4.5.1.1 General Image Attribute Descriptions

5.4.5.1.1.1 Patient Orientation

Derived from original if Screen Save Viewer.

Empty if Filmer

5.4.5.1.1.2 Image Type

If a third value is defined in the original DICOM Image Type, then the image type is set to:

DERIVED\SECONDARY\<Originaltype>\SCREEN SAVE

If no third value is defined in the original DICOM Image Type or if the Image Type is empty, then the image type is set to:

DERIVED\SECONDARY\SCREEN SAVE

5.4.5.1.1.3 Derivation Description

This field is not encoded

5.4.5.2 Image Pixel Module

This section specifies the Attributes that describe the pixel data of the image.

TABLE 5.4-8
IMAGE PIXEL MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002	1	1 - if image is displayed in levels of gray 3 - if image is displayed in full colors
Photometric Interpretation	(0028,0004)	1	Defined by the application. The following values are possible: . MONOCHROME1 . MONOCHROME2 . RGB
Planar Configuration	(0028, 0006)	1C	0, if element (0x0028, 0x0002) is 3 Not present otherwise
Pixel Aspect Ratio	(0028, 0034)	1C	Derived from original image. Not present if equal to 1\1
Rows	(0028,0010)	1	Viewer If original image rows < 512, then 512 If 512<= original image rows <= 2560, then original image rows If 2560 < original image rows, then 2560 Filmer If original image rows < 256, then 256 If 256 <= original image rows <= 2560, then original image rows If 2560 < original image rows, then 2560

Columns	(0028,0011)	1	Viewer If original image columns < 512, then 512 If 512<= original image columns <= 2560, then original image columns If 2560 < original image columns, then 2560 Filmer If original image columns < 256, then 256 If 256 <= original image columns <= 2560, then original image columns If 2560 < original image columns, then 2560
Pixel Spacing	(0028,0030)	3	Derived from the original image *Pixel Size* if defined in original image Not Present if *Pixel Size* is not defined in original image
Bits Allocated	(0028,0100)	1	Copy of original image *Bits Allocated* value or 8 if the element (0028, 0002) has value 3.
Bits Stored	(0028,0101)	1	Copy of original image *Bits Stored* value or 8 if the element (0028, 0002) has value 3
High Bit	(0028,0102)	1	Bits Stored - 1
Pixel Representation	(0028,0103)	1	Copy of original image *Pixel Representation* value or 0000h if the element (0028, 0002) has value 3
Pixel Data	(7FE0,0010)	1	Derived from original pixel data

5.4.5.3 SC Image Module

The table in this Section contains IOD Attributes that describe SC images.

TABLE 5.4-9
SC IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Date of Secondary Capture	(0018,1012)	3	Creation date of the Secondary Capture
Time of Secondary Capture	(0018,1014)	3	Creation time of the Secondary Capture

5.4.5.4 Overlay Plan Modules

This module is not implemented for this IOD.

5.4.5.5 Modality LUT module

This section specifies the Attributes that describe the Modality LUT.

TABLE 5.4-10
MODALITY LUT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Rescale Intercept	(0028,1052)	1C	If the image is saved as a grayscale image and if the original image header contains Rescale intercept value then the SC image contains its copy. If the image is saved as a color image this element is not present.
Rescale Slope	(0028,1053)	1C	If the image is saved as a grayscale image and if the original image header contains Rescale slope value then the SC image contains its copy. If the image is saved as a color image this element is not present.
Rescale Type	(0028,1054)	1C	If the element (0028, 0002) has value of 3 or if the image header does not contain *Rescale intercept*, this element is not present, otherwise it is set to US.

5.4.5.6 VOI LUT Modules

This section specifies the Attributes that describe the VOI LUT.

TABLE 5.4-11
VOI LUT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
VOI LUT Sequence	(0028, 3010)	3	Present if the application that sends the image to the Filmer provides a VOI LUT for the image.
> LUT Descriptor	(0028, 3002)	1C	See 5.4.5.5
> LUT Data	(0028, 3006)	1C	The VOI LUT Data in the item. If the number of data is < 2^16-1, then the Value Representation is set to US. If the number of data is > 2^16-1, then the Value Representation is set to OW.
Window Center	(0028,1050)	3	Current *Window Center (WL)* applied in the Filmer when saving is processed. This element is applicable only with *Photometric Interpretation* (0x0028,0x0004) value of MONOCHROME1 and MONOCHROME2 otherwise this element is *Not Present*
Window Width	(0028,1051)	1C	Current *Window Center (WL)* applied in the Filmer when saving is processed. This element is written only with *Photometric Interpretation* (0x0028,0x0004) value of MONOCHROME1 and MONOCHROME2 otherwise this element is *Not Present*

Note: When the VOI LUT Sequence is present in the image, there is always only one item present in this sequence.

5.4.5.7 SOP Common Module

This section defines the Attributes that are required for proper functioning and identification of the associated SOP Instances. They do not specify any semantics about the Real-World Object represented by the IOD.

TABLE 5.4-12
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	1	Generated from GE Based UID: <station configuration> and timestamp

Specific Character Set	(0008,0005)	1C	• If original field is not present:
			  • Set to ISO_IR 100 if some fields contain non-English characters.
			  • Otherwise the field is not generated
			• If original field is present, original value
			NOTE: Multi valued Specific Character Set with first value non-null and Specific Character Set ISO_IR 13 are not supported.

5.5 SC- PRIVATE DATA DICTIONARY

This section describes the private attributes that can be used in this IOD.

TABLE 5.5-1
PRIVATE CREATOR IDENTIFICATION: GEMS_IDEN_01

Attribute Name	Tag	Type	VR	VM
Full fidelity	(0009,XX01)	3	LO	1
Suite id	(0009,XX02)	3	SH	1
Product id	(0009,XX04)	3	SH	1
Image actual date	(0009,XX27)	3	SL	1
Service id	(0009,XX30)	3	SH	1
Mobile location number	(0009,XX31)	3	SH	1
Equipment UID	(0009,XXE3)	3	UI	1
Genesis Version - now	(0009, XXE6)	3	SH	1
Exam Record checksum	(0009, XXE7)	3	UL	1
Series Suite Id	(0009, XXE8)	3	SH	1
Actual series data time stamp	(0009, XXE9)	3	SL	1

TABLE 5.5-3
PRIVATE CREATOR IDENTIFICATION: GEMS_RELA_01

Attribute Name	Tag	Type	VR	VM
Series from which Prescribed	(0021,XX03)	3	SS	1

Genesis Version - now	(0021,XX05)	3	SH	1
Series Record checksum	(0021,XX07)	3	UL	1
Screen Format	(0021,XX37)	3	SS	1

TABLE 5.5-4
PRIVATE CREATOR IDENTIFICATION: GEMS_SERS_01

Attribute Name	Tag	Type	VR	VM
Images in Series	(0025,XX07)	3	SL	1
Last Instance Number used	(0025,XX19)	3	SL	1
Primary Receiver Suite and Host	(0025,XX1A)	3	SH	1

TABLE 5.5-5
PRIVATE CREATOR IDENTIFICATION: GEMS_IMPS_01

Attribute Name	Tag	Type	VR	VM
Version of the hdr struct	(0029,XX26)	3	SS	1
Advantage comp. Overflow	(0029,XX34)	3	SL	1
Advantage comp. Underflow	(0029,XX35)	3	SL	1

TABLE 5.5-6
PRIVATE CREATOR IDENTIFICATION: GEMS_PARM_01

Attribute Name	Tag	Type	VR	VM
Decon kernel parameters	(0043,XX13)	3	SS	5

TABLE 5.5-7
PRIVATE CREATOR IDENTIFICATION: GEMS_DL_IMG_01

Attribute Name	Tag	Type	VR	VM
Acquisition plane	(0019,XXDE)	3	CS	1

Note: These elements are present in the generated Secondary Capture if these elements were present in the images provided by the calling application.

6. ENHANCED STRUCTURED REPORT INFORMATION OBJECT IMPLEMENTATION

6.1 INTRODUCTION

This section specifies the use of the DICOM Enhanced SR IOD to represent the information included in Enhanced SR produced by this implementation. Corresponding attributes are conveyed using the module construct. The Enhanced DICOM SR produced by this implementation is also named: "Electronic Film"

6.2 AW PIONEER MAPPING OF DICOM ENTITIES

TABLE 6.2-1
MAPPING OF DICOM ENTITIES TO AW PIONEER ENTITIES

DICOM	AW Pioneer Entity
Patient	Patient
Study	Exam
Series	Series
Equipment	Equipment
SR document	SR document

6.3 IOD MODULE TABLE

Within an entity of the DICOM ENHANCED SR IOD, attributes are grouped into related set of attributes. A set of related attributes is termed a module. A module facilitates the understanding of the semantics concerning the attributes and how the attributes are related with each other. A module grouping does not infer any encoding of information into datasets.

Table 6.3.1 identifies the defined modules within the entities which comprise the DICOM SR IOD. Modules are identified by Module Name.

See DICOM Part 3 for a complete definition of the entities, modules, and attributes.

TABLE 6.3-1
ENHANCED SR DOCUMENT IOD MODULES

Entity Name	Module Name	Reference
Patient	Patient	**6.4.1.1**
	Specimen Identification	**N/A**
	Clinical Trial Subject	**N/A**
Study	General Study	**6.4.2.1**
	Patient Study	**6.4.2.2**
	Clinical Trial Study	**N/A**
Series	SR document Series	**6.4.3.1**
	Clinical Trial Series	**N/A**
Equipment	General Equipment	**6.4.4.1**

Document	SR document General	**6.4.5.1**
	SR document Content	**6.4.5.2**
	SOP Common	**6.4.5.3**

6.4 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the ENHANCED SR Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and from where these values are obtained. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions).

An Electronic Film is a DICOM ENHANCED SR IOD generated by the 'Filmer'.

In the following chapter, all new study, series and image instance UID are generated from Filmer base UID: **1.2.840.113619.2..**

Note: Elements not listed are not supported

6.4.1 Patient Entity Modules

6.4.1.1 Patient Module

This section specifies the attributes of the Patient that describe and identify the Patient who is the subject of a diagnostic Study. This Module contains attributes of the patient that are needed for diagnostic interpretation of the Image and are common for all studies performed on the patient.

TABLE 6.4-1
PATIENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	Patient name of first referenced image if No Mix Mode or Mix Mode = Study User defined if Mix Mode = Patient
Patient ID	(0010,0020)	2	Patient ID of first referenced image if No Mix Mode or Mix Mode = Study Function of pid and time if Mix Mode = Patient
Issuer of Patient ID	(0010,0021)	3	Not filled
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	3	Not filled
Patient's Birth Date	(0010,0030)	2	Patient's Birth Date of first referenced image if No Mix Mode or Mix Mode = Study Empty if Mix Mode = Patient
Patient's Sex	(0010,0040)	2	Patient's Sex of first referenced image if No Mix Mode or Mix Mode = Study Empty if Mix Mode = Patient
Other Patient IDs	(0010,1000)	3	Not filled
Other Patient Ids Sequence	(0010,1002)	3	Not filled

6.4.2 Study Entity Modules

The following Study IE Modules are common to all Composite Image IODs that reference the Study IE.

6.4.2.1 General Study Module

This section specifies the Attributes, which describe and identify the Study performed upon the Patient.

TABLE 6.4-2
GENERAL STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Notes
Study Instance UID	(0020,000D)	1	Original if No Mix Mode Generated if Mix Mode = Patient or Mix Mode = Study
Study Date	(0008,0020)	2	Study Date of first referenced image (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Study Time	(0008,0030)	2	Study Time of first referenced image (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Accession Number	(0008,0050)	2	Accession Number of first referenced image (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Referring Physician's Name	(0008,0090)	2	Referring Physician's Name of first referenced image (Empty if does not exist) if No Mix Mode Semantically empty if Mix Mode = Patient or Mix Mode = Study (The content may be empty or contain only ^)
Study Description	(0008,1030)	3	Study Description of first referenced image (Empty if does not exist) if No Mix Mode User defined if Mix Mode = Patient or Mix Mode = Study
Study ID	(0020,0010)	2	Study ID of first referenced image (Empty if does not exist) if No Mix Mode Generated if Mix Mode = Patient or Mix Mode = Study

6.4.2.2 Patient Study Module

This section defines Attributes that provide information about the Patient at the time the Study was performed.

TABLE 6.4-3
PATIENT STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description

Patient's Age	(0010,1010)	3	Patient's Age of first referenced image if No Mix Mode Not present if Mix Mode = Patient or Mix Mode = Study
Patient's Size	(0010,1020)	3	Patient's Size of first referenced image if No Mix Mode Not present if Mix Mode = Patient or Mix Mode = Study
Patient's Weight	(0010,1030)	3	Patient's Weight of first referenced image if No Mix Mode Not present if Mix Mode = Patient or Mix Mode = Study

6.4.3 Series Entity Modules

The following SR Document Series IE Modules are common to all Composite Image IODs that reference the SR Document Series IE.

6.4.3.1 SR Document Series Module

This section specifies the attributes that identify and describe general information about the SR Document Series within a Study.

TABLE 6.4-4
SR DOCUMENT SERIES MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	SR
Series Instance UID	(0020,000E)	1	Generated
Series Number	(0020,0011)	1	Generated
Referenced Performed Procedure Step Sequence	(0008,1111)	2	Empty
Series Description	(0008,103E)	3	User defined, filled by default with "AW Electronic Film"
Series Date	(0008,0021)	3	Not present
Series Time	(0008,0031)	3	Not present

Note: The series description is also present in the content of the SR. (See AW41 EF TID template description in section 6.6)

6.4.4 Equipment Entity Modules

The following Equipment IE Module is common to all Composite Image IODs that reference the Equipment IE.

6.4.4.1 General Equipment Module

This section specifies the attributes that identify and describe the piece of equipment that produced a Series of Images.

TABLE 6.4-5
GENERAL EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	GE MEDICAL SYSTEMS
Institution Name	(0008,0080)	3	Hospital Name provided on the platform (Hospital Name for Filmer)
Station Name	(0008,1010)	3	Host name provided on the platform
Manufacturer's Model Name	(0008,1090)	3	FILMER_3.0
Software Versions	(0018,1020)	3	Software version build identifier

6.4.5 Document Entity Modules

The following SR document Modules are common to all Composite Image IODs that reference the Image IE.

6.4.5.1 SR document General

This section specifies the attributes that identify and describe the SR document.

TABLE 6.4-6
SR DOCUMENT GENERAL MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020, 0013)	1	Generated
Completion flag	(0040, A491)	1	COMPLETE
Verification flag	(0040, A493)	1	VERIFIED
Content Date	(0008, 0023)	1	Generated at the date when the Electronic film is created
Content Time	(0008, 0033)	1	Generated at the time when the Electronic film is created
Verifying Observer Sequence	(0040,A073)	1C	
> Verifying Observer Name	(0040,A075)	1	Name of the user that currently is logged on the station
> Verifying Observer Code Sequence	(0040,A088)	2	Empty
> Verifying Organization	(0040,A027)	1	Institution Name (0008,0080) of General Equipment Module
> Verifying Date Time	(0040,A030)	1	Generated at the time when the Electronic film is created
Performed Procedure Code Sequence	(0040, A372)	2	Empty

Current Requested Procedure Evidence Sequence	(0040,A375)	1C	List of images from all studies considered as input of the Electronic Film: Practically, there will be one study item, one series item and then one image item per image in the Filmer
> Study Instance UID	(0020,000D)	1	Refer to (0040,A375)
> Referenced Series Sequence	(0008,1115)	1	Refer to (0040,A375)
>> Series Instance UID	(0020,000E)	1	Refer to (0040,A375)
>> Referenced SOP Sequence	(0008,1199)	1	Refer to (0040,A375)
>>> Referenced SOP Class UID	(0008,1150)	1	Refer to (0040,A375)
>>> Referenced SOP Instance UID	(0008,1155)	1	Refer to (0040,A375)

6.4.5.2 SR Document Content Module

This section specifies the attributes that identify and describe the SR content

TABLE 6.4-7
SR DOCUMENT CONTENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Content Template Sequence	(0040, A504)	1C	Template that describes the content of the content item
> Mapping Resource	(0008, 0105)	1	PRIVATE
> Template Identifier	(0040, DB00)	1	AW41 EF TID
Content Sequence	(0040, A730)	1C	Content of the DICOM SR (see section 6.6)
Value Type	(0040, A040)	1	CONTAINER
Concept Name code Sequence	(0040, A043)	1C	
> Code Value	(0008, 0100)	1C	AWVF-0001
> Coding Scheme Designator	(0008, 0102)	1C	99GEMS
> Code Meaning	(0008, 0104)	1C	Electronic Film Presentation
Continuity Of Content	(0040, A050)	1C	SEPARATE

6.4.5.3 SOP Common Module

This section defines the Attributes that are required for proper functioning and identification of the associated SOP Instances. They do not specify any semantics about the Real-World Object represented by the IOD.

TABLE 6.4-8
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.88.22
SOP Instance UID	(0008,0018)	1	Generated from GE Based UID, <station configuration> and timestamp.

Specific Character Set	(0008,0005)	1C	• ISO_IR 100 if Mix Mode = Patient
			• Otherwise:
			  • ISO_IR 100 if original value is not present and at least one of the Dicom data element contains non-ascii characters.
			  • Original value otherwise
			Note: Multi valued Specific Character Set with first value non-null and Specific Character Set ISO_IR 13 are not supported.

6.5 ENHANCED SR – PRIVATE DATA DICTIONARY

This section describes the private attributes of this IOD.

TABLE 6.5-1
PRIVATE CREATOR IDENTIFICATION: GEMS_ADWSOFT_DPO1

Attribute Name	Tag	Type	VR	VM	Attribute Description
Private Entity Launch Command	(0039,XX95)	3	LO	1	Name of application to launch

6.6 ENHANCED SR – TEMPLATE IDENTIFICATION

This section describes the Electronic Film Presentation Template

This template describes how the SR Document Content Module of the Enhanced SR Information Object Definition is constrained for the purpose of implementing the Electronic Film. This template is non-standard, Mapping Resource (0008,0105) = PRIVATE, Template Identifier (0040,DB00) = AW41 EF TID.

6.6.1 TID Electronic Film Presentation

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV(AWVF-0001,99GEMS, "Electronic Film Presentation")	1	M		Root Node, SEPARATE
2	>	HAS OBS CONTEXT	INCLUDE	DTID (1003) Person observer identifying attributes	1	M		
3	>	CONTAINS	INCLUDE	ETID Page Presentation	1-n	U		

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
4	>	HAS CONCEPT MOD	CODE	EV (113011, DCM, "Document Title Modifier")	1	MC		Present and equal to (0008,103E)

6.6.2 TID Page Presentation

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		-	CONTAINER	EV(AWVF-0002, 99GEMS, "Page Presentation")	1	M		SEPARATE
2	>	CONTAINS	INCLUDE	ETID Slot Group Presentation	1-n	U		

6.6.3 TID Slot Group Presentation

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		-	CONTAINER	EV(AWVF-0003, 99GEMS, "Slot Group Presentation")	1	M		SEPARATE
2	>	CONTAINS	INCLUDE	ETID Geometry	1	M		
3	>	CONTAINS	INCLUDE	ETID Slot Presentation	1-n	U		

6.6.4 TID Slot Presentation

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		-	CONTAINER	EV(AWVF-0004, 99GEMS, "Slot Presentation")	1	M		SEPARATE
2	>	CONTAINS	INCLUDE	ETID Geometry	1	M		
3	>	CONTAINS	TEXT	EV(AWVF-0009, 99GEMS, "Notepad")	1	UC	IF rows 4 and 5 absent	
4	>	CONTAINS	IMAGE		1	UC	IF rows 3 and 5 absent	
5	>	-	INCLUDE	ETID Cine Sequence	1	UC	IF rows 3 and 4 absent	

6.6.5 TID Cine Sequence

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		CONTAINS	NUM	EV(AWVF-0010, 99GEMS, "Time between cine frames")	1	M		UNITS=EV(s, UCUM,"second")
2		CONTAINS	IMAGE		1-n	M		

6.6.6 TID Geometry

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		-	NUM	EV(AWVF-0005, 99GEMS, "Relative horizontal position of top left corner")	1	M		UNITS=EV(1, UCUM, "ratio")

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
2		-	NUM	EV(AWVF-0006, 99GEMS, "Relative vertical position of top left corner")	1	M		UNITS=EV(1, UCUM, "ratio")
3		-	NUM	EV(AWVF-0007, 99GEMS, "Relative horizontal size")	1	M		UNITS=EV(1, UCUM, "ratio")
4		-	NUM	EV(AWVF-0008, 99GEMS, "Relative vertical size")	1	M		UNITS=EV(1, UCUM, "ratio")

6.7 ENHANCE SR - PRIVATE CODED ENTRIES

The private coded entries that are required for implementing the Electronic Film are listed below (these are referred to in the Electronic Film Presentation Template).

TABLE 6.7-1
PRIVATE CODED ENTRIES: 99GEMS

Coded Entries		
Coding Scheme Designator (0008,0102)	**Code Value (0008,0100)**	**Code Meaning (0008,0104)**
99GEMS	AWVF-0001	Electronic Film Presentation
99GEMS	AWVF-0002	Page Presentation
99GEMS	AWVF-0003	Slot Group Presentation
99GEMS	AWVF-0004	Slot Presentation
99GEMS	AWVF-0005	Relative horizontal position of top left corner
99GEMS	AWVF-0006	Relative vertical position of top left corner
99GEMS	AWVF-0007	Relative horizontal size
99GEMS	AWVF-0008	Relative vertical size
99GEMS	AWVF-0009	Notepad
99GEMS	AWVF-0010	Time between cine frames

7. KEY OBJECT SELECTION DOCUMENT INFORMATION OBJECT IMPLEMENTATION

7.1 INTRODUCTION

This section specifies the use of the DICOM Key Object Selection Document IOD to represent the information included in KOS produced by this implementation. Corresponding attributes are conveyed using the module construct.

7.2 AW PIONEER MAPPING OF DICOM ENTITIES

The AW Pioneer maps DICOM Information Entities to local Information Entities in the product's database and user interface.

TABLE 7.2-1
MAPPING OF DICOM ENTITIES TO AW PIONEER ENTITIES

DICOM	AW Pioneer Entity
Patient	Patient
Study	Exam
Series	Series
Equipment	Equipment
Key Object Selection document	Key Object Selection document

7.3 IOD MODULE TABLE

Within an entity of the DICOM KEY OBJECT SELECTION IOD, attributes are grouped into related set of attributes. A set of related attributes is termed a module. A module facilitates the understanding of the semantics concerning the attributes and how the attributes are related with each other. A module grouping does not infer any encoding of information into datasets.

Table 7.3-1 identifies the defined modules within the entities which comprise the DICOM KEY OBJECT SELECTION IOD. Modules are identified by Module Name.

See DICOM Part 3 for a complete definition of the entities, modules, and attributes.

TABLE 7.3-1
KEY OBJECT SELECTION DOCUMENT IOD MODULES

Entity Name	Module Name	Reference
Patient	Patient	**7.4.1.1**
	Specimen Identification	**N/A**
	Clinical Trial Subject	**N/A**
Study	General Study	**7.4.2.1**
	Patient Study	**7.4.2.2**
	Clinical Trial Study	**N/A**
Series	Key Object Document Series	**7.4.3.1**
	Clinical Trial Series	**N/A**
Equipment	General Equipment	**7.4.4.1**
Document	Key Object Document	**7.4.5.1**
	SR document Content	**7.4.5.2**
	SOP Common	**7.4.5.3**

7.4 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the KEY OBJECT SELECTION Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and from where these values are obtained. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions).

The Key Object Selection IOD described here is the one generated by the application 'Filmer' of AW Pioneer.

In the following chapter, all new study, series and image instance UID are generated from Filmer base UID: **1.2.840.113619.2..**

Note: Elements not listed are not supported

7.4.1 Patient Entity Modules

7.4.1.1 Patient Module

This section specifies the attributes of the Patient that describe and identify the Patient who is the subject of a diagnostic Study. This Module contains attributes of the patient that are needed for diagnostic interpretation of the Image and are common for all studies performed on the patient.

TABLE 7.4-1
PATIENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	Patient name of first referenced image if No Mix Mode or Mix Mode = Study User defined if Mix Mode = Patient
Patient ID	(0010,0020)	2	Patient ID of first referenced image if No Mix Mode or Mix Mode = Study Function of pid and time if Mix Mode = Patient
Issuer of Patient ID	(0010,0021)	3	Not filled
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	3	Not filled
Patient's Birth Date	(0010,0030)	2	Patient's Birth Date of first referenced image if No Mix Mode or Mix Mode = Study Empty if Mix Mode = Patient
Patient's Sex	(0010,0040)	2	Patient's Sex of first referenced image if No Mix Mode or Mix Mode = Study Empty if Mix Mode = Patient
Other Patient IDs	(0010,1000)	3	Not filled
Other Patient Ids Sequence	(0010,1002)	3	Not filled

7.4.2 Study Entity Modules

The following Study IE Modules are common to all Composite Image IODs that reference the Study IE.

7.4.2.1 General Study Module

This section specifies the Attributes, which describe and identify the Study performed upon the Patient.

TABLE 7.4-2
GENERAL STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Notes
Study Instance UID	(0020,000D)	1	Original if No Mix Mode Generated if Mix Mode = Patient or Mix Mode = Study
Study Date	(0008,0020)	2	Study Date of first referenced image (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Study Time	(0008,0030)	2	Study Time of first referenced image (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Accession Number	(0008,0050)	2	Accession Number of first referenced image (Empty if does not exist) if No Mix Mode Empty if Mix Mode = Patient or Mix Mode = Study
Referring Physician's Name	(0008,0090)	2	Referring Physician's Name of first referenced image (Empty if does not exist) if No Mix Mode Semantically empty if Mix Mode = Patient or Mix Mode = Study (The content may be empty or contain only ^)
Study Description	(0008,1030)	3	If No Mix Mode, this is the study Description of first referenced image. It is not present if the original study description is empty. User defined if Mix Mode = Patient or Mix Mode = Study
Study ID	(0020,0010)	2	Study ID of first referenced image (Empty if does not exist) if No Mix Mode Generated if Mix Mode = Patient or Mix Mode = Study

7.4.2.2 Patient Study Module

This section defines Attributes that provide information about the Patient at the time the Study was performed.

TABLE 7.4-3
PATIENT STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description

Patient's Age	(0010,1010)	3	Patient's Age of first referenced image if No Mix Mode Not present if Mix Mode = Patient or Mix Mode = Study
Patient's Size	(0010,1020)	3	Patient's Size of first referenced image if No Mix Mode Not present if Mix Mode = Patient or Mix Mode = Study
Patient's Weight	(0010,1030)	3	Patient's Weight of first referenced image if No Mix Mode Not present if Mix Mode = Patient or Mix Mode = Study

7.4.3 Series Entity Modules

The following Key Object Document Series IE Modules are common to all Composite Image IODs that reference the Key Object Document Series IE.

7.4.3.1 Key Object Document Series Module

This section specifies the attributes that identify and describe general information about the Key Object Document Series within a Study.

TABLE 7.4-4
KEY OBJECT SELECTION DOCUMENT SERIES MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	KO
Series Instance UID	(0020,000E)	1	Generated
Series Number	(0020,0011)	1	Generated
Series Description	(0008,103E)	3	Begin with "Of Interest: ", followed by user description (filled by default with "AW Electronic Film")
Series Date	(0008,0021)	3	Not present
Series Time	(0008,0031)	3	Not present
Referenced Performed Procedure Step Sequence	(0008,1111)	2	Empty

7.4.4 Equipment Entity Modules

The following Equipment IE Module is common to all Composite Image IODs that reference the Equipment IE.

7.4.4.1 General Equipment Module

This section specifies the attributes that identify and describe the piece of equipment that produced a Series of Images.

TABLE 7.4-5
GENERAL EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	GE MEDICAL SYSTEMS
Institution Name	(0008,0080)	3	Hospital Name provided on the platform (Hospital Name for Filmer)
Station Name	(0008,1010)	3	Host name provided on the platform
Manufacturer's Model Name	(0008,1090)	3	FILMER_3.0
Software Versions	(0018,1020)	3	Software version build identifier

7.4.5 Document Entity Modules

The following Key Object document Modules are common to all Composite Image IODs that reference the Image IE.

7.4.5.1 Key Object Document Module

This section specifies the attributes that identify and describe the Key Object document.

TABLE 7.4-6
KEY OBJECT DOCUMENT GENERAL MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020, 0013)	1	Generated
Content Date	(0008, 0023)	1	Generated at the date when the Key Object is created
Content Time	(0008, 0033)	1	Generated at the time when the Key Object is created
Referenced Request Sequence	(0040,A370)	1C	N/A
Current Requested Procedure Evidence Sequence	(0040,A375)	1C	List of images referenced within the Key Object Selection. Practically, there will be one study item, one series item and then one image item per image in the Filmer
> Study Instance UID	(0020,000D)	1	Refer to (0040,A375)
> Referenced Series Sequence	(0008,1115)	1	Refer to (0040,A375)
>> Series Instance UID	(0020,000E)	1	Refer to (0040,A375)
>> Referenced SOP Sequence	(0008,1199)	1	Refer to (0040,A375)
>>> Referenced SOP Class UID	(0008,1150)	1	Refer to (0040,A375)
>>> Referenced SOP Instance UID	(0008,1155)	1	Refer to (0040,A375)

7.4.5.2 SR Document Content Module

This section specifies the attributes that identify and describe the SR Document content

TABLE 7.4-7
SR DOCUMENT CONTENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Value Type	(0040, A040)	1	CONTAINER
Concept Name code Sequence	(0040, A043)	1C	Describe Title "Of Interest" in DCID(7010) Key Object Selection Document Titles
> Code Value	(0008, 0100)	1C	113000
> Coding Scheme Designator	(0008, 0102)	1C	DCM
> Code Meaning	(0008, 0104)	1C	Of Interest
Continuity Of Content	(0040, A050)	1C	SEPARATE
Content Template Sequence	(0040, A504)	1C	Template that describes the content of the content item
> Mapping Resource	(0008, 0105)	1	DCMR
> Template Identifier	(0040, DB00)	1	2010
Observation Date Time	(0040, A032)	1C	Generated at the date and time when the Key Object is created
Content Sequence	(0040, A730)	1C	Content of the DICOM KEY OBJECT SELECTION – See 7.5

7.4.5.3 SOP Common Module

This section defines the Attributes that are required for proper functioning and identification of the associated SOP Instances. They do not specify any semantics about the Real-World Object represented by the IOD.

TABLE 7.4-8
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.88.59
SOP Instance UID	(0008,0018)	1	Generated from GE Based UID, <station configuration> and timestamp.

Specific Character Set	(0008,0005)	1C	• ISO_IR 100 if Mix Mode = Patient
			• Otherwise:
			  • ISO_IR 100 if original value is not present and at least one of the Dicom data element contains non-ascii characters.
			  • Original value otherwise
			Note: Multi valued Specific Character Set with first value non-null and Specific Character Sets ISO_IR 13 or ISO 2022 IR 13 are not supported.

7.5 KEY OBJECT SELECTION – TEMPLATE IDENTIFICATION

This section describes the Key Object Selection Template – TID 2010

This template describes how the SR Document Content Module of the Key Object Selection Information Object Definition is constrained. This template is the standard TID 2010.

7.5.1 TID 2010 Key Object Selection

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DCID(7010) Key Object Selection Document Title	1	M		Root node
2	>	HAS CONCEPT MOD	CODE	EV (113011, DCM, "Document Title Modifier")	1-n	U		Not used
3	>	HAS CONCEPT MOD	CODE	EV (113011, DCM, "Document Title Modifier")	1	UC	IF Row 1 Concept Name = (113001, DCM, "Rejected for Quality Reasons") or (113010, DCM," Quality Issue")	DCID (7011)
4	>	HAS CONCEPT MOD	CODE	EV (113011, DCM, "Document Title Modifier")	1	MC	IF Row 1 Concept Name = (113013, DCM, "Best In Set")	DCID (7012)
5	>	HAS CONCEPT MOD	INCLUDE	DTID(1204) Language of Content Item and Descendants	1	U		Not used
6	>	HAS OBS CONTEXT	INCLUDE	DTID(1002) Observer Context	1-n	U		Present
7	>	CONTAINS	TEXT	EV(113012, DCM, "Key Object Description")	1	U		User defined, filled by default with "AW Electronic Film"
8	>	CONTAINS	IMAGE	Purpose of Reference shall not be present	1-n	MC		Present

7.5.2 TID 1002 Observer Context

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		HAS OBS CONTEXT	CODE	EV (121005,DCM, "Observer Type")	1	MC		EV (121006,DCM, "Person")
2		HAS OBS CONTEXT	INCLUDE	DTID (1003) Person observer identifying attributes	1	MC		

7.5.3 TID 1003 Person Observer Identifying Attributes

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			PNAME	EV (121008,DCM, "Person Observer Name")	1	M		Name of the current user
2			TEXT	EV (121009,DCM, " Person Observer's Organization Name")	1	U		Hospital Name provided on the platform

8. X-RAY ANGIOGRAPHIC INFORMATION OBJECT IMPLEMENTATION

8.1 INTRODUCTION

The AW Pioneer 2D Multi-Modality Viewer can save all injected frames of a DSA or Bolus multi-frame image (including user annotations and measurements) into a new XA multi-frame image. In case of biplane acquisition, two XA multi-frame images will be saved, corresponding to both frontal and lateral original images. This feature only works on XA GE images.

The aim of the DEVIRED XA images, is it to create substracted images for systems that cannot perform the operation. The substraction is applied in it and so the object generated can be reviewed on elsewhere without having to apply processing again.

This section specifies the use of the DICOM XA Image IOD to represent the information included in XA image produced by this implementation. Corresponding attributes are conveyed using the module construct.

8.2 AW PIONEER MAPPING OF DICOM ENTITIES

TABLE 8.2-1 MAPPING OF DICOM ENTITIES TO AW PIONEER ENTITIES

DICOM	AW Pioneer Entity
Patient	Patient
Study	Exam
Series	Series
Equipment	Equipment
Image	Image

8.3 IMAGE-IOD MODULE TABLE

Within an entity of the DICOM XA Image IOD, attributes are grouped into related set of attributes. A set of related attributes is termed a module. A module facilitates the understanding of the semantics concerning the attributes and how the attributes are related with each other. A module grouping does not infer any encoding of information into datasets.

Table 8.3-1 identifies the defined modules within the entities which comprise the DICOM XA Image IOD. Modules are identified by Module Name.

See DICOM Part 3 for a complete definition of the entities, modules, and attributes.

TABLE 8.3-1 XA **IMAGE** DOCUMENT IOD MODULES

Entity Name	Module Name	Reference
Patient	Patient	**8.4.1**
	Clinical Trial Subject	**N/A**
Study	General Study	**8.4.2.1**
	Patient Study	**8.4.2.2**
	Clinical Trial Study	**N/A**
Series	General Series	**8.4.3**
	Clinical Trial Series	**N/A**
Equipment	General Equipment	**8.4.4**
Image	General Image	**8.4.5.1**
	Image Pixels	**8.4.5.2**
	Contrast/Bolus	**8.4.5.3**
	Cine	**8.4.5.4**
	Multi-Frame	**8.4.5.5**
	Frame Pointers	**8.4.5.6**
	Display Shutter	**N/A**
	Device	**N/A**
	Intervention	**N/A**
	X-Ray Image	**8.4.5.7**
	X-Ray Acquisition	**8.4.5.8**
	X-Ray Collimator	**8.4.5.9**
	X-Ray Table	**8.4.5.10**
	XA Positioner	**8.4.5.11**
	DX Detector	**8.4.5.12**
	Overlay Plane	**N/A**
	Multi-Frame Overlay	**N/A**
	Modality LUT	**N/A**
	VOI LUT	**8.4.5.13**
	SOP Common	**8.4.5.14**
	X-Ray Filtration (standard extended)	**8.4.5.15**
	Mask	**N/A**

8.4 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the XA Image Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and from where these values are obtained. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions).

The XA Image IOD described here is the one generated by the applications 'Viewer' of Advantage Workstation 4.6, based on an original XA image.

In the following chapter, all new study, series and image instance UID are generated from AW Pioneer 2D Multi-Modality Viewer base UID: **1.2.840.113619.2.**.

Also note that elements not listed in following modules are ignored and not copied.

8.4.1 Patient Entity Modules

8.4.1.1 Patient Module

This section specifies the attributes of the Patient that describe and identify the Patient who is the subject of a diagnostic Study. This Module contains attributes of the patient that are needed for diagnostic interpretation of the Image and are common for all studies performed on the patient.

TABLE 8.4-1 PATIENT MODULE

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	Copy from original
Patient ID	(0010,0020)	2	Copy from original
Issuer of Patient ID	(0010,0021)	3	Copy from original
Issuer of Patient ID Qualifiers Sequence	(0010,0024)	3	Copy from original
Patient's Birth Date	(0010,0030)	2	Copy from original
Patient's Sex	(0010,0040)	2	Copy from original
Other Patient Ids	(0010,1000)	3	Copy from original
Other Patient Ids Sequence	(0010,1002)	3	Copy from original

8.4.2 Study Entity Modules

8.4.2.1 General Study Module

TABLE 8.4-2 GENRAL STUDY MODULE

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020,000D)	1	Copy from original
Study Date	(0008,0020)	2	Copy from original
Study Time	(0008,0030)	2	Copy from original
Referring Physician's Name	(0008,0090)	2	Copy from original
Study ID	(0020,0010)	2	Copy from original
Accession Number	(0008,0050)	2	Copy from original
Study Description	(0008,1030)	3	Copy from original
Name of Physician(s) Reading Study	(0008,1060)	3	Copy from original
Referenced Study Sequence	(0008,1110)	3	Copy from original if present, not present otherwise
>Referenced SOP Class UID	(0008,1150)	1	Copy from original
>Referenced SOP instance UID	(0008,1155)	1	Copy from original
Procedure Code Sequence	(0008,1032)	3	Copy from original if present, not present otherwise
>Code Value	(0008,0100)	1C	Copy from original
>Coding Scheme Designator	(0008,0102)	1C	Copy from original
>Code Meaning	(0008,0104)	1C	Copy from original

8.4.2.2 Patient Study Module

TABLE 8.4-3 PATIENT STUDY MODULE

Attribute Name	Tag	Type	Attribute Description
Patient's Age	(0010.1010)	3	Copy from original
Patient's Size	(0010,1020)	3	Copy from original
Patient's Weight	(0010,1030)	3	Copy from original
Admission ID	(0038,0010)	3	Copy from original

8.4.3 Series Entity Module

TABLE 8.4-4 SERIES MODULE

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	Copy from original
Series Instance UID	(0020,000E)	1	Generated
Series Number	(0020,0011)	2	Copy from original
Performing Physicians' Name	(0008,1050)	3	Copy from original
Protocol Name	(0018,1030)	3	Copy from original
Series Description	(0008,103E)	3	"Processed:" followed by original series description. Eventually truncated to 64 chars.
Operators' Name	(0008,1070)	3	Current user's name
Patient Position	(0018,5100)	3	Copy from original
Request Attributes Sequence	(0040,0275)	3	Copy from original if present, not present otherwise
>Requested Procedure ID	(0040,1001)	1C	Copy from original if present, not present otherwise
>Requested Procedure Description	(0032,1060)	3	Copy from original
>Requested Procedure Code Sequence	(0032,1064)	3	Copy from original if present, not present otherwise
>>Code Value	(0008,0100)	1C	Copy from original
>>Coding Scheme Designator	(0008,0102)	1C	Copy from original
>>Code Meaning	(0008,0104)	1C	Copy from original
>Scheduled Procedure Step ID	(0040,0009)	1C	Copy from original if present, not present otherwise
>Scheduled Procedure Step Description	(0040,0007)	3	Copy from original
>Scheduled Protocol Code Sequence	(0040,0008)	3	Copy from original if present, not present otherwise
>>Code Value	(0008,0100)	1C	Copy from original
>>Coding Scheme Designator	(0008,0102)	1C	Copy from original
>>Code Meaning	(0008,0104)	1C	Copy from original

8.4.4 Equipment Entity Module

The following Equipment IE Module is common to all Composite Image IODs that reference the Equipment IE.

TABLE 8.4-5 EQUIPMENT MODULE

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	Copy from original
Institution Name	(0008,0080)	3	Copy from original
Institution Address	(0008,0081)	3	Copy from original
Station Name	(0008,1010)	3	Copy from original
Manufacturer's Model Name	(0008,1090)	3	Copy from original
Device Serial Number	(0018,1000)	3	Copy from original
Software versions	(0018,1020)	3	Copy from original

8.4.5 Image Entity Modules

This section specifies the Attributes that describe the Image Entity Modules.

8.4.5.1 General Image Module

TABLE 8.4-6 GENERAL IMAGE MODULE

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	Copy from original
Patient Orientation	(0020,0020)	2C	Copy from original if same number of frames than original, calculated otherwise
Content Date	(0008,0023)	2C	Copy from original
Content Time	(0008,0033)	2C	Copy from original
Image Type	(0008,0008)	3	"DERIVED\SECONDARY\SINGLE PLANE" or "DERIVED\SECONDARY\BIPLANE A" or "DERIVED\SECONDARY\BIPLANE B" Eventually followed by: - "DISTORTION FREE", if the fourth field of original image is equal to "DISTORTION FREE", - "IMAGE PASTING", if the fourth field of original image is equal to "IMAGE PASTING"
Acquisition Date	(0008,0022)	3	Copy from original
Acquisition Time	(0008,0032)	3	Copy from original

Referenced Image Sequence	(0008,1140)	3	Not present in case of single plane
>Referenced SOP class UID	(0008,1150)	1C	SOP Class UID of the derived other plane of a biplane pair
>Referenced SOP instance UID	(0008,1155)	1C	Instance UID of the derived other plane of a biplane pair
>Purpose of Referenced Code Sequence	(0040,A170)	3	Generated
>>Code Value	(0008,0100)	1C	"121314"
>>Coding Scheme Designator	(0008,0102)	1C	"DCM"
>>Code meaning	(0008,0104)	1C	"Other image of biplane pair"
Source Image Sequence	(0008,2112)	3	Generated
>Referenced SOP class UID	(0008,1150)	1C	SOP class UID of the original XA image
>Referenced SOP instance UID	(0008,1155)	1C	Instance UID of the original XA image
> Referenced Frame Number	(0008,1160)	1C	Not present
Image Comments	(0020,4000)	3	Copy from original
Burned In Annotation	(0028,0301)	3	Copy from original
Lossy Image Compression	(0028,2110)	3	Copy from original

8.4.5.2 Image Pixels Module

TABLE 8.4-7 IMAGE PIXELS MODULE

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	Copy from original
Photometric Interpretation	(0028,0004)	1	Copy from original
Rows	(0028,0010)	1	Copy from original
Columns	(0028,0011)	1	Copy from original
Bits Allocated	(0028,0100)	1	Copy from original
Bits Stored	(0028,0101)	1	Copy from original
High Bit	(0028,0102)	1	Copy from original
Pixel Representation	(0028,0103)	1	Copy from original
Pixel Data	(7FE0,0010)	1	Derived from original pixel data

8.4.5.3 Contrast Bolus Module

This module is not present in generated image if it is not present in original one.

TABLE 8.4-8 CONTRAST BOLUS MODULE

Attribute Name	Tag	Type	Attribute Description
Contrast/Bolus Agent	(0018,0010)	2	Copy from original

8.4.5.4 Cine Module

This module is not present in generated image if it is not present in original one.

TABLE 8.4-9 CINE MODULE

Attribute Name	Tag	Type	Attribute Description
Frame Time	(0018,1063)	1C	Copy from original if present, not present otherwise
Frame Time Vector	(0018,1065)	1C	If present in original image: - Copy from original if same number of frames than original, - subset of original otherwise If not present in original image: Not Present
Start Trim	(0008,2142)	3	Copy from original if same number of frames than original, set to 1 otherwise
Stop Trim	(0008,2143)	3	Copy from original if same number of frames than original, set to number of frames (0028,0008) otherwise
Recommended Display Frame Rate	(0008,2144)	3	Copy from original
Cine Rate	(0018,0040)	3	Copy from original
Frame Delay	(0018,1066)	3	Copy from original if same number of frames than original, based on original otherwise

8.4.5.5 Multi Frame Module

TABLE 8.4-10 MULTI-FRAME MODULE

Attribute Name	Tag	Type	Attribute Description
Number Of Frames	(0028,0008)	1C	Set to number of opacified images, otherwise copy of original (if no mask)
Frame Increment Pointer	(0028,0009)	1C	Copy from original Note: if number of frames different than original, and if Frame Increment Pointer is (0018,1063), keep pointer to (0018,1063) Frame Time value.

8.4.5.6 Frame Pointers Module

TABLE 8.4-11 FRAME POINTERS MODULE

Attribute Name	Tag	Type	Attribute Description

Representative Frame Number	(0028,6010)	3	Copy from original if same number of frames than original, (new value = old value - first opacified frame number) otherwise

8.4.5.7 X-Ray Image Module

TABLE 8.4-12 X-RAY IMAGE MODULE

Attribute Name	Tag	Type	Attribute Description
Frame Increment Pointer	(0028,0009)	1C	Copy from original
Lossy Image Compression	(0028,2110)	1C	Copy from original
Image Type	(0008,0008)	3	"DERIVED\SECONDARY\SINGLE PLANE" or "DERIVED\SECONDARY\BIPLANE A" or "DERIVED\SECONDARY\BIPLANE B" Eventually followed by: - "DISTORTION FREE", if the fourth field of original image is equal to "DISTORTION FREE", - "IMAGE PASTING", if the fourth field of original image is equal to "IMAGE PASTING"
Pixel Intensity Relationship	(0028,1040)	1	"DISP"
Samples per Pixel	(0028,0002)	1	Copy from original
Photometric Interpretation	(0028,0004)	1	Copy from original
Bits Allocated	(0028,0100)	1	Copy from original
Bits Stored	(0028,0101)	1	Copy from original
High Bit	(0028,0102)	1	Copy from original
Pixel Representation	(0028,0103)	1	Copy from original
Scan Options	(0018,0022)	3	Copy from original
Referenced Image Sequence	(0008,1140)	1C	Not present in case of single plane
>Referenced SOP class UID	(0008,1150)	1C	SOP Class UID of the derived other plane of a biplane pair
>Referenced SOP instance UID	(0008,1155)	1C	Instance UID of the derived other plane of a biplane pair
>Purpose of Referenced Code Sequence	(0040,A170)	3	See below
>>Code Value	(0008,0100)	1C	"121314"
>>Coding Scheme Designator	(0008,0102)	1C	"DCM"
>>Code meaning	(0008,0104)	1C	"Other image of biplane pair"
Calibration Image	(0050,0004)	3	Copy from original

8.4.5.8 X-Ray Acquisition Module

TABLE 8.4-13 X-RAY ACQUISITION MODULE

Attribute Name	Tag	Type	Attribute Description
KVP	(0018,0060)	2	Copy from original
Radiation Setting	(0018,1155)	1	Copy from original
X-Ray Tube Current	(0018,1151)	2C	Copy from original
Exposure Time	(0018,1150)	2C	Copy from original
Exposure	(0018,1152)	2C	Copy from original
Grid	(0018,1166)	3	Copy from original
Average Pulse Width	(0018,1154)	3	Copy from original
Radiation Mode	(0018,115A)	3	Copy from original
Intensifier Size	(0018,1162)	3	Copy from original
Field of View Shape	(0018,1147)	3	Copy from original
Field of View Dimension(s)	(0018,1149)	3	Copy from original
Focal Spot	(0018,1190)	3	Copy from original
Image and Fluoroscopy Area Dose Product	(0018,115E)	3	Copy from original

8.4.5.9 X-Ray Collimator Module

This module is not present in generated image if it is not present in original one.

TABLE 8.4-14 X-RAY COLLIMATOR MODULE

Attribute Name	Tag	Type	Attribute Description
Collimator Shape	(0018,1700)	1	Copy from original
Collimator Left Vertical Edge	(0018,1702)	1C	Copy from original
Collimator Right Vertical Edge	(0018,1704)	1C	Copy from original
Collimator Upper Horizontal Edge	(0018,1706)	1C	Copy from original
Collimator Lower Horizontal Edge	(0018,1708)	1C	Copy from original

8.4.5.10 X-Ray Table Module

This module is not present in generated image if it is not present in original one.

TABLE 8.4-15 X-RAY TABLE MODULE

Attribute Name	Tag	Type	Attribute Description
Table Motion	(0018,1134)	2	Copy from original
Table Vertical Increment	(0018,1135)	2C	Copy from original if same number of frames than original, based on original otherwise
Table Longitudinal Increment	(0018,1137)	2C	Copy from original if same number of frames than original, based on original otherwise

Table Lateral Increment	(0018,1136)	2C	Copy from original if same number of frames than original, based on original otherwise
Table Angle	(0018,1138)	3	Copy from original

8.4.5.11 XA Positioner Module

TABLE 8.4-16 XA POSITIONER MODULE

Attribute Name	Tag	Type	Attribute Description
Distance Source To Patient	(0018,1111)	3	Copy from original if same number of frames than original, based on original otherwise
Distance Source To Detector	(0018,1110)	3	Copy from original if same number of frames than original, based on original otherwise
Estimated Radiographic Magnification Factor	(0018,1114)	3	Copy from original
Positioner Motion	(0018,1500)	2C	Copy from original
Positioner Primary Angle	(0018,1510)	2	Copy from original if same number of frames than original, based on original otherwise
Positioner Secondary Angle	(0018,1511)	2	Copy from original if same number of frames than original, based on original otherwise
Positioner Primary Angle Increment	(0018,1520)	2C	If present in original image: - Copy from original if same number of frames than original, - based on original otherwise If not present in original image: Not Present
Positioner Secondary Angle Increment	(0018,1521)	2C	If present in original image: - Copy from original if same number of frames than original, - based on original otherwise If not present in original image: Not Present

8.4.5.12 DX Detector Module

This module is not present in generated image if it is not present in original one.

TABLE 8.4-17 DX DETECTOR MODULE

Attribute Name	Tag	Type	Attribute Description
Detector Type	(0018,7004)	2	Copy from original

Field of View Shape	(0018,1147)	3	Copy from original
Field of View Dimension(s)	(0018,1149)	3	Copy from original
Field of View Origin	(0018,7030)	1C	Copy from original if present, not present otherwise
Field of View Rotation	(0018,7032)	1C	Copy from original if present, not present otherwise
Field of View Horizontal Flip	(0018,7034)	1C	Copy from original if present, not present otherwise
Imager Pixel Spacing	(0018,1164)	3	Copy from original

8.4.5.13 VOI Lut Module

TABLE 8.4-18 VOI LUT MODULE

Attribute Name	Tag	Type	Attribute Description
Window Center	(0028,1050)	3	current one
Window Width	(0028,1051)	3	current one

8.4.5.14 SOP Common Module

TABLE 8.4-19 SOP COMMON MODULE

Attribute Name	Tag	Type	Attribute Description
Sop Class UID	(0008,0016)	1	XA SOP class UID
Sop Instance UID	(0008,0018)	1	Generated
Specific Character Set	(0008,0005)	1C	Copy from original
Instance Number	(0020,0013)	2	Copy from original

8.4.5.15 X-Ray Filtration Module (standard extended)

TABLE 8.4-20 X-RAY FILTRATION MODULE

Attribute Name	Tag	Type	Attribute Description
Filter Type	(0018,1160)	3	Copy from original

8.5 XA IMAGE-PRIVATE DATA DICTIONARY

This section describes the private attributes of this IOD.

TABLE 8.5-1 PRIVATE CREATOR IDENTIFICATION: DLX_SERIE_01

Attribute Name	Tag	VR	VM	Type
adx acq mode	(0019,xx14)	IS	1	3
ip address	(0019,xx20)	LO	1	3
Lambda cm pincushion distortion	(0019,xx24)	DS	1	3
Slope LV regression	(0019,xx25)	DS	1	3
Intercept LV regression	(0019,xx26)	DS	1	3
table vertical position	(0019,xx21)	DS	1	3
table longitudinal position	(0019,xx22)	DS	1	3
table lateral position	(0019,xx23)	DS	1	3

angle value 1	(0019,xx01)	DS	1	3
angle value 2	(0019,xx02)	DS	1	3
angle value 3	(0019,xx03)	DS	1	3
user spatial filter strength	(0019,xx17)	IS	1	3

TABLE 8.5-2 PRIVATE CREATOR IDENTIFICATION: GEMS_DL_IMG_01

Attribute Name	Tag	VR	VM	Type
patient orientation vector	(0019,xxBF)	CS	2-2N	3
patient position per image	(0019,xxC7)	CS	1	3
Acquisition plane	(0019,xxDE)	CS	1	3
contrast bolus ingredient relative absorption	(0019,xxE0)	FL	1	3
auto injection enabled	(0019,xxA4)	CS	1	3
injection phase	(0019,xxA5)	CS	1	3
injection delay	(0019,xxA6)	DS	1	3
reference injection frame number	(0019,xxA7)	IS	1	3
recommended display frame rate float	(0019,xxB8)	FL	1	3
fov dimension double	(0019,xx0B)	DS	1-2	3
Distance Object to Table Top	(0019,xx2B)	FL	1	3
detector gain	(0019,xx34)	DS	1	3
image detector rotation angle	(0019,xx92)	DS	1	3
image flip	(0019,xx95)	CS	2	3
can downscan 512	(0019,xxAA)	CS	1	3
Acquisition Mode Description	(0019,xxB1)	LO	1	3
Acquisition Mode Display Label	(0019,xxB2)	LO	1	3
Acquisition Protocol User Name	(0019,xxB3)	LO	1	3
Acquisition Region	(0019,xxBA)	CS	1	3
Acquisition SUB mode	(0019,xxBB)	CS	1	3
preselected pivot rotation speed	(0019,xxC5)	FL	1	3
detection gain value	(0019,xxD4)	FL	1	3
mR mAs calibration value	(0019,xxD5)	FL	1	3
DRM LUT file name	(0019,xxDC)	LO	1	3
DRM Strength	(0019,xxDD)	DS	1-N	3
Table Tilt Angle First frame	(0019,xxEE)	FL	1	3
table rotation angle	(0019,xxEA)	FL	1	3
table cradle angle	(0019,xxBC)	FL	1	3
table rotation status vector	(0019,xxBD)	CS	1-N	3
table rotation angle increment	(0019,xxC3)	FL	1-N	3
Table X Position to Isocenter	(0019,xxEB)	FL	1	3
Table Y Position to Isocenter	(0019,xxEC)	FL	1	3
Table Z Position to Isocenter	(0019,xxED)	FL	1	3
Table X Position to Isocenter increment	(0019,xxD7)	FL	1-N	3
Table Y Position to Isocenter increment	(0019,xxD8)	FL	1-N	3
Table Z Position to Isocenter increment	(0019,xxD9)	FL	1-N	3
Table Head Tilt Angle increment	(0019,xxDA)	FL	1-N	3

Table Cradle Tilt Angle increment	(0019,xxDB)	FL	1-N	3
angle 1 increment	(0019,xx97)	DS	1-N	3
angle 2 increment	(0019,xx98)	DS	1-N	3
angle 3 increment	(0019,xx99)	DS	1-N	3
SID vector	(0019,xxBE)	FL	1-N	3
SOD vector	(0019,xxE9)	FL	1-N	3
spectral filter thickness	(0019,xxC4)	IS	1	3
default spatial filter family	(0019,xx31)	IS	1	3
default spatial filter strength	(0019,xx32)	IS	1	3
current spatial filter strength	(0019,xxAB)	IS	1	3
applicable review mode	(0019,xx9D)	CS	1	3
log lut control points	(0019,xx9E)	DS	1-N	3
exp lut SUB control points	(0019,xx9F)	DS	1-N	3
ABD value	(0019,xxA0)	DS	1	3
sub window center	(0019,xxA1)	DS	1	3
sub window width	(0019,xxA2)	DS	1	3
exp lut NOSUB control points	(0019,xxAD)	DS	1-N	3
SUB operator LUTs names	(0019,xxAE)	LO	1-N	3
current spatial filter strength	(0019,xxAB)	IS	1	3

TABLE 8.5-3 PRIVATE CREATOR IDENTIFICATION: GEMS_DL_STUDY_01

Attribute Name	Tag	VR	VM	Type
study dose	(0015,xx80)	DS	1	3
study total dap	(0015,xx81)	DS	1	3
study fluoro dap	(0015,xx82)	DS	1	3
study fluoro time	(0015,xx83)	IS	1	3
study record dap	(0015,xx84)	DS	1	3
study record time	(0015,xx85)	IS	1	3
Study dose Frontal	(0015,xx92)	FL	1	3
Study total dap Frontal	(0015,xx93)	FL	1	3
study fluoro dap frontal	(0015,xx94)	FL	1	3
study fluoro time frontal	(0015,xx95)	IS	1	3
study record dap frontal	(0015,xx96)	FL	1	3
study record time frontal	(0015,xx97)	IS	1	3
study dose lateral	(0015,xx98)	FL	1	3
study total dap lateral	(0015,xx99)	FL	1	3
study fluoro dap lateral	(0015,xx9A)	FL	1	3
study fluoro time lateral	(0015,xx9B)	IS	1	3
study record dap lateral	(0015,xx9C)	FL	1	3
study record time lateral	(0015,xx9D)	IS	1	3

TABLE 8.5-4 PRIVATE CREATOR IDENTIFICATION: GEMS_FUNCTOOL_01

Attribute Name	Tag	VR	VM	Type

Bias	(0051,xx03)	SL	1	3
Scale	(0051,xx04)	FL	1	3

TABLE 8.5-5 PRIVATE CREATOR IDENTIFICATION: GEMS_IDEN_01

Attribute Name	Tag	VR	VM	Type
Full Fidelity	(0009,xx01)	LO	1	3
Suite id	(0009,xx02)	SH	1	3
Product ID	(0009,xx04)	SH	1	3
Image actual date	(0009,xx27)	SL	1	3
Unique Service ID from config file	(0009,xx30)	SH	1	3
Mobile Location Number	(0009,xx31)	SH	1	3
Equipment UID	(0009,xxE3)	UI	1	3
Genesis version - now - 09	(0009,xxE6)	SH	1	3
Exam record checksum	(0009,xxE7)	UL	1	3
Series suite id	(0009,xxE8)	SH	1	3
Actual series data time stamp	(0009,xxE9)	SL	1	3

TABLE 8.5-6 PRIVATE CREATOR IDENTIFICATION: GEMS_IMPS_01

Attribute Name	Tag	VR	VM	Type
Version of the hdr struct	(0029,xx26)	SS	1	3
Advantage comp. Overflow	(0029,xx34)	SL	1	3
Advantage comp. Underflow	(0029,xx35)	SL	1	3

TABLE 8.5-7 PRIVATE CREATOR IDENTIFICATION: GEMS_PARM_01

Attribute Name	Tag	VR	VM	Type
Decon kernel parameters	(0043,xx13)	SS	5	3

TABLE 8.5-8 PRIVATE CREATOR IDENTIFICATION: GEMS_RELA_01

Attribute Name	Tag	VR	VM	Type
Series from which Prescribed	(0021,xx03)	SS	1	3
Genesis version - now - 21	(0021,xx05)	SH	1	3
Series record checksum	(0021,xx07)	UL	1	3
Screen Format	(0021,xx37)	SS	1	3

TABLE 8.5-9 PRIVATE CREATOR IDENTIFICATION: GEMS_SERS_01

Attribute Name	Tag	VR	VM	Type
Images in Series	(0025,xx07)	SL	1	3
Last image number used	(0025,xx19)	SL	1	3
Primary Receiver Suite and Host	(0025,xx1A)	SH	1	3

9. BASIC DIRECTORY INFORMATION OBJECT IMPLEMENTATION

9.1 IOD MODULE TABLE

Table 8.1-1 identifies the defined modules within the entities which comprise the Basic Directory IOD. Modules are identified by Module Name.

See DICOM Part 3 for a complete definition of the entities, modules, and attributes.

TABLE 9.1-1 BASIC DIRECTORY IOD MODULES

Entity Name	Module Name	Reference
File Set Identification	File Set Identification	Sec 9.2.1
Directory Information	Directory Information	Sec 9.2.2

9.2 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the Basic Directory Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained from. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions). Also note that Attributes not present in tables are not supported.

9.2.1 File Set Identification Module

TABLE 9.2-1 FILE-SET IDENTIFICATION MODULE

Attribute Name	Tag	Type	Attribute Description
File-set ID	(0004,1130)	2	Set by application

9.2.2 Directory Information Module

TABLE 9.2-2 DIRECTORY INFORMATION MODULE

Attribute Name	Tag	Type	Attribute Description
Offset of the First Directory Record of the Root Directory Entity	(0004,1200)	1	Set by application
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	1	Set by application
File-set Consistency Flag	(0004,1212)	1	0000H: no known inconsistencies
Directory Record Sequence	(0004,1220)	2	Supported
>Offset of the Next Directory Record	(0004,1400)	1	Set by application
>Record In-use Flag	(0004,1410)	1	FFFFH: record is in use

>Offset of Referenced Lower-Level Directory Entity	(0004,1420)	1	Set by application
>Directory Record Type	(0004,1430)	1	PATIENT, STUDY, SERIES, IMAGE, PRESENTATION, SR DOCUMENT and PRIVATE
>Private Record UID	(0004,1432)	1C	Not supported
>Referenced File ID	(0004,1500)	1C	Generated only for Image Directory Record, starting with A/A/A/A/Z01
>Referenced SOP Class UID in File	(0004,1510)	1C	Generated only for Image, Presentation and SR Document Directory Records
>Referenced SOP Instance UID in File	(0004,1511)	1C	Generated only for Image, Presentation and SR Document Directory Records. Set to SOP Instance UID (0008,0018) during save to media.
>Referenced Transfer Syntax UID in File	(0004,1512)	1C	Generated only for Image, Presentation and SR Document Directory Records
> Referenced Related General SOP Class UID in File	(0004,151A)	1C	Not supported
>Record Selection Keys			See 7.2.3 and Section 3 for Additional Keys per Application Profiles.

9.2.3 Definition of Specific Directory Records

9.2.3.1 Patient Directory Record Definition

TABLE 9.2-3 PATIENT RECORD KEYS

Key	Tag	Type (for CD)	Type (for DVD / USB)	Attribute Description
Specific Character Set	(0008,0005)	1C	1C	If present in composite object instances it will be set to same value
Patient's Name	(0010,0010)	2	2	If present in composite object instances it will be set to same value, otherwise sent empty
Patient ID	(0010,0020)	1	1	If present in composite object instances it will be set to same value, otherwise sent empty
Patient Birth Date	(0010,0030)	E	1C	If present in composite object instances it will be set to same value, otherwise not present
Patient Birth Time	(0010,0032)	E	E	If present in composite object instances it will be set to same value, otherwise not present
Patient Sex	(0010,0040)	E	1C	If present in composite object instances it will be set to same value, otherwise not present

NOTE: E represents Standard Extended Element.

9.2.3.2 Study Directory Record Definition

TABLE 9.2-4 STUDY RECORD KEYS

Key	Tag	Type (for CD)	Type (for DVD / USB)	Attribute Description
Specific Character Set	(0008,0005)	1C	1C	If present in composite object instances it will be set to same value
Study Date	(0008,0020)	1	1	If present in composite object instances it will be

				set to same value, otherwise computed
Study Time	(0008,0030)	1	1	If present in composite object instances it will be set to same value, otherwise computed
Study Description	(0008,1030)	2	2	If present in composite object instances it will be set to same value, otherwise sent empty
Study Instance UID	(0020,000D)	1C	1C	This is set to value that is present in the composite object instances, otherwise composite object instances are not Archived
Study ID	(0020,0010)	1	1	If present in composite object instances it will be set to same value, otherwise computed
Accession Number	(0008,0050)	2	2	If present in composite object instances it will be set to same value, otherwise sent empty

9.2.3.2.1 Method to set default values for Study Date and Time

Below is the logic for providing default values for Study Date and Time if the values are found null or if absent in the DICOM file

```
if (studyDateTime is present)
{
        put its value in DICOMDIR
}
else
{
        look for seriesDateTime
        if (seriesDateTime is present)
        {
                put seriesDateTime value in DICOMDIR
        }
        else
        {
                look for acquisitionDateTime (either ((0008,0022),(0008,0032)) or (0008,002A))
                if (acquisitionDateTime is present)
                {
                        put acquisitionDateTime value in DICOMDIR
                }
                else
                {
                        look for contentDateTime
                        if(contentDateTime is present)
                        {
                                put contentDateTime value in DICOMDIR
                        }
                        else
                        {
                                look for instanceCreationDateTime
                                if(instanceCreationDateTime is present)
                                {
                                        put instanceCreationDateTime value in DICOMDIR
                                }
                                else
                                {
                                        put a DummyDateTime
                                }
```

```
                        }
                }
        }
}
```

9.2.3.2.2 Method to set default value for Study ID

Below is the logic for providing default values for Study ID if the values are found null or if absent in the DICOM file

```
if (studyID is present in the image)
{
        put studyID value in DICOMDIR
}
else
{
        put a dummy studyID value in DICOMDIR. please take care of the length (< 16)
}
```

9.2.3.3 Series Directory Record Definition

TABLE 9.2-5 SERIES RECORD KEYS

Key	Tag	Type (for CD)	Type (for DVD / USB)	Attribute Description
Specific Character Set	(0008,0005)	1C	1C	If present in composite object instances it will be set to same value
Modality	(0008,0060)	1	1	If present in composite object instance it will be set to same value, otherwise an error is returned and the object not put on media
Series Instance UID	(0020,000E)	1	1	This is set to value that is present in the composite object instance, otherwise check for presence of Referenced SOP Instance UID in File (0004,1511), if both not present, instance is not put on media.
Series Number	(0020,0011)	1	1	If present in composite object instance it will be set to same value, otherwise computed
Icon Image Sequence	(0088,0200)	3	3	Not supported
Manufacturer	(0008,0070)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Manufacturer's Model Name	(0008,1090)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Performing Physician's Name	(0008,1050)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Institution Name	(0008,0080)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Institution Address	(0008,0081)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent

NOTE: E represents Standard Extended Element.

9.2.3.3.1 Method to set default value for Series Number

Below is the logic for providing default values for Series number if the values are found null or if absent in the DICOM file

```
dummySeriesNum = 0;
if (seriesNum is present in image)
{
        put seriesNum value in DICOMDIR
}
else
{
        if (same series)
        {
                put dummySeriesNum value in DICOMDIR
        }
        else (different series)
        {
                put (++dummySeriesNum) value in DICOMDIR
        }
}
```

9.2.3.4 Image Directory Record Definition

TABLE 9.2-6 IMAGE RECORD KEYS

Key	Tag	Type (for CD)	Type (for DVD / USB)	Attribute Description
Specific Character Set	(0008,0005)	1C	1C	If present in composite object instances it will be set to same value
SOP Instance UID	(0008, 0018)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Acquisition Time	(0008, 0032)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Acquisition Datetime	(0008,002A)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Type	(0008,0008)	1C	1C	If present in composite object instances it will be set to same value, otherwise not sent
Referenced Image Sequence	(0008,1140)	1C	1C	If present in composite object instances it will be set to same value, otherwise not sent
Sequence Variant	(0018,0021)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Slice Thickness	(0018,0050)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Repetition Time	(0018,0080)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Echo Time	(0018,0081)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Inversion Time	(0018,0082)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Number of Averages	(0018,0083)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Echo Number	(0018,0086)	E	E	If present in composite object instances it will be set to same value, otherwise not sent

Spacing between slices	(0018,0088)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Data Collection Diameter	(0018,0090)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Contrast/Bolus Route	(0018,1040)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Trigger Time	(0018,1060)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Reconstruction Diameter	(0018,1100)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Gantry/Detector Tilt	(0018,1120)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Convolution Kernel	(0018,1210)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Flip Angle	(0018,1314)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Acquisition Time Synchronized	(0018,1800)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Instance Number	(0020,0013)	1	1	If present in composite object instance it will be set to same value, otherwise computed
Image Position (Patient)	(0020,0032)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Orientation (Patient)	(0020,0037)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Frame of Reference UID	(0020,0052)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Slice Location	(0020,1041)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Synchronization Frame of Reference UID	(0020,0200)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Rows	(0028,0010)	E	1	If present in composite object instances it will be set to same value, otherwise not sent
Columns	(0028,0010)	E	1	If present in composite object instances it will be set to same value, otherwise not sent
Pixel Spacing	(0028,0030)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Number of Frames	(0028,0008)	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Lossy Image Compression Ratio	(0028,2112	E	1C	If present in composite object instances it will be set to same value, otherwise not sent
Calibration Image	(0050,0004)	E	1C	Not used
Units	(0054,1001)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Attenuation Correction Method	(0054,1101)	E	E	If present in composite object instances it will be set to same value, otherwise not sent
Reconstruction Method	(0054,1103)	E	E	present in composite object instances it will be set to same value, otherwise not sent

NOTE: E represents Standard Extended Element.

9.2.3.4.1 Method to set default value for Instance number

Below is the logic for providing default values for Instance number if the values are found null or if absent in the DICOM file

```
dummyInstanceNum = 0;
if (instanceNum is present in image)
{
        put instanceNum value in DICOMDIR
}
else
{
        put ++ dummyInstanceNum in DICOMDIR
}
```

9.2.3.5 Presentation Directory Record Definition

TABLE 9.2-7 PRESENTATION RECORD KEYS

Key	Tag	Type (for CD)	Type (for DVD / USB)	Attribute Description
Specific Character Set	(0008,0005)	1C	1C	If present in composite object instances it will be set to same value
Instance Number	(0020,0013)	1	1	If present in composite object instance it will be set to same value, otherwise computed
SOP Instance UID	(0008,0018)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Referenced Series Sequence	(0008,1115)	1C	1C	Not used.
Content Label	(0070,0080)	1	1	If present in composite object instance it will be set to same value, otherwise not sent
Content Description	(0070,0081)	2	2	If present in composite object instances it will be set to same value, otherwise not sent
Presentation Creation Date	(0070,0082)	1	1	If present in composite object instances it will be set to same value, otherwise not sent
Presentation Creation Time	(0070,0083)	1	1	If present in composite object instances it will be set to same value, otherwise not sent
Content Creator's Name	(0070,0084)	2	2	If present in composite object instances it will be set to same value, otherwise not sent

NOTE: E represents Standard Extended Element.

9.2.3.6 Structured Report Directory Record Definition

TABLE 9.2-8 SR RECORD KEYS

Key	Tag	Type (for CD)	Type (for DVD / USB)	Attribute Description
Specific Character Set	(0008,0005)	1C	1C	If present in composite object instances it will be set to same value
Instance Number	(0020,0013)	1	1	If present in composite object instance it will be set to same value, otherwise computed
SOP Instance UID	(0008,0018)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Completion Flag	(0040,A491)	1	1	If present in composite object instance it will be set to same value, otherwise not sent
Content Date	(0008,0023)	1	1	If present in composite object instances it will

				be set to same value, otherwise not sent
Content Time	(0008,0033)	1	1	If present in composite object instances it will be set to same value, otherwise not sent
Concept Name Code Sequence	(0040,A043)	1C	1C	If present in composite object instances it will be set to same value, otherwise not sent
Verifying Observer Sequence	(0040,A073)	E	E	If present in composite object instances it will be set to same value, otherwise sent empty
Verification Flag	(0040,A493)	1	1	If present in composite object instances it will be set to same value, otherwise not sent
Verification Date Time	(0040,A030)	1C	1C	Not used
Content Sequence	(0040,A730)	1C	1C	Not used

NOTE: E represents Standard Extended Element.

9.2.3.7 Private (GEMS PET Raw) Directory Record Definition

TABLE 9.2-9 PRIVATE (GEMS PET RAW) RECORD KEYS

Key	Tag	Type (for CD)	Type (for DVD / USB)	Attribute Description
Specific Character Set	(0008,0005)	1C	1C	If present in composite object instances it will be set to same value
Instance Number	(0020,0013)	1	1	If present in composite object instance it will be set to same value, otherwise computed
SOP Instance UID	(0008,0018)	2	2	If present in composite object instances it will be set to same value, otherwise sent empty
Frame of Reference UID	(0020,0052)	2	2	If present in composite object instance it will be set to same value, otherwise sent empty
Rows	(0028,0010)	2	2	If present in composite object instances it will be set to same value, otherwise sent empty
Columns	(0028,0011)	2	2	If present in composite object instances it will be set to same value, otherwise sent empty
Private Record UID	(0004,1432)	1C	1C	Not supported

10. PRINT MANAGEMENT SOP CLASS DEFINITION

10.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the supported Print Management SOP and Meta SOP Classes, the optional attributes and service elements supported, the valid range of values for mandatory and optional attributes, and the status code behavior.

Note: Elements not listed in this section are not supported

10.1.1 Basic Film Session SOP Class

The DICOM Print SCU AE supports the N-CREATE DIMSE Service Element for the Basic Film Session SOP Class.

- The N-CREATE DIMSE Service element sent by the DICOM Print SCU AE requests the Remote DICOM Print SCP to create an instance of Basic Film Session.

10.1.1.1 IOD Description

10.1.1.1.1 IOD modules

Module	Reference	Module Description
SOP Common		Contains SOP Common information
Basic Film Session Presentation Module	10.1.1.1.2	Contains Film Session presentations information
Basic Film Session Relationship	10.1.1.1.3	References to related SOPs

10.1.1.1.2 Basic Film Session Presentation Module

Attribute name	Tag	Attribute Description
Number of Copies	(2000,0010)	1 to 10, depending of print builder configuration. Default value: 1
Print Priority	(2000,0020)	HIGH or MED or LOW depending of default configuration Default value: LOW
Medium Type	(2000,0030)	PAPER or CLEAR FILM or BLUE FILM depending of configuration of associated Remote DICOM printer Default value: BLUE FILM
Film Destination	(2000,0040)	MAGAZINE or PROCESSOR depending of configuration of associated Remote DICOM printer Default value:PROCESSOR
Film Session Label	(2000,0050)	Configurable by the Field Engineer Not sent by default

10.1.1.1.3 Basic Film Session Relationship Module

Not Used

10.1.1.2 DIMSE Service Group

DIMSE Service Element	Usage SCU
N-CREATE	M
N-SET	Not used
N-DELETE	Not used
N-ACTION	Not used

10.1.1.2.1 N-CREATE

10.1.1.2.1.1 Attributes

Attribute Name	Tag	Usage SCU
Number of Copies	(2000,0010)	Used
Print Priority	(2000,0020)	Used
Medium Type	(2000,0030)	Used
Film Destination	(2000,0040)	Used
Film Session Label	(2000,0050)	Used, not sent if empty
Memory Alocation	(2000,0060)	Not Used

10.1.1.2.1.2 Status

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Warning	B600	Memory allocation not supported	Association is aborted
Success	0000	Film session successfully created	Next step describe in the sequencing of Real-World Activities paragraph is performed

Note: The association is aborted for all other status.

10.1.1.2.1.3 Behavior

No specific behavior

10.1.1.2.2 N-SET

This service is not used.

10.1.1.2.3 N-DELETE

This service is not used.

10.1.1.2.4 N-ACTION

This service is not used.

10.1.2 Basic Film Box SOP Class

The DICOM Print SCU AE supports the following DIMSE Service Element for the Basic Film Box SOP Class.

- The N-CREATE DIMSE Service element sent by the DICOM Print SCU AE requests the Remote DICOM Print SCP to create an instance of Basic Film Box
- The N-ACTION DIMSE Service element sent by the DICOM Print SCU AE requests the Remote DICOM Print SCP to print the Basic Film Box onto the hard copy printer.
- The N-DELETE DIMSE Service element sent by the DICOM Print SCU AE requests the Remote DICOM Print SCP to release the Basic Film Box instance.

10.1.2.1 IOD Description

10.1.2.1.1 IOD modules

Module	Reference	Module Descripion
SOP Common		Contains SOP Common information
Basic Film Box Presentation Module	10.1.2.1.2	Contains Film Box presentation information
Basic Film Box Relationship	10.1.2.1.3	References to related SOPs

10.1.2.1.2 Basic Film Box Presentation Module

Attribute Name	Tag	Attribute Description
Image Display Format	(2010,0010)	STANDARD\C,R [C 1 to 5] and [R 1 to 4] SLIDE SUPERSLIDE Default value: STANDARD (Depending of configuration of associated remote DICOM printer).
Annotation Display Format ID	(2010,0030)	Not sent.
Film Orientation	(2010,0040)	PORTRAIT LANDSCAPE Default value: PORTRAIT (Depending of configuration of associated remote DICOM printer).
Film Size ID	(2010,0050)	8INX10IN 8_5INX11IN(Letter) 10INX12IN 10INX14IN 11INX14IN 11INX17IN 14INX14IN 14INX17IN 24CMX24CM 24CMX30CM A4 (210mmx297mm) A3 (297mm x 420mm) (Depending of configuration of associated remote DICOM printer). Default value: First selection when declaring printer.
Magnification Type	(2010,0060)	One of the following defined term is sent: REPLICATE BILINEAR CUBIC NONE Default value: CUBIC (Depending of configuration set by user when declaring the printer).
Smoothing Type	(2010,0080)	Sent if Magnification type = CUBIC Default value: "" (Depending of configuration set by user when declaring the printer).
Border density	(2010,0100)	BLACK or WHITE depending of default configuration. Default value: BLACK

Empty Image Density	(2010,0110)	BLACK or WHITE depending of default configuration. Default value: ""
Min Density	(2010,0120)	-1 by default or set to positive integer. Default value depends of configuration set by user when declaring the printer
Max Density	(2010,0130)	-1 by default or set to positive integer. Default value depends of configuration set by user when declaring the printer
Trim	(2010,0140)	Set to YES or NO according to value set by user when declaring the printer. Default value: NO
Configuration Information	(2010,0150)	Empty by default or set to a value defined when declaring the printer.
Illumination	(2010,015E)	Not sent.
Reflected Ambient Light	(2010,0160)	Not sent.
Requested Resolution ID	(2020,0050)	Not sent.
Referenced Presentation LUT Sequence	(2050,0500)	Not sent.

10.1.2.1.3 Basic Film Box Relationship Module

Attribute Name	Tag	Attribute Description
Referenced Film Session Sequence	(2010,0500)	Used (Set)
>Referenced SOP Class UID	(0008,1150)	Used (Set)
>Referenced SOP Instance UID	(0008,1155)	Used (Set)
Referenced Image Box Sequence	(2010,0510)	Used (Received)
>Referenced SOP Class UID	(0008,1150)	Used (Received)
>Referenced SOP Instance UID	(0008,1155)	Used (Received)
Referenced Basic Annotation Box Sequence	(2010,0520)	Not used
>Referenced SOP Class UID	(0008,1150)	Not used
>Referenced SOP Instance UID	(0008,1155)	Not used

10.1.2.2 DIMSE Service Group

DIMSE Service Element	Usage SCU
N-CREATE	M
N-ACTION	M
N-DELETE	Used

10.1.2.2.1 N-CREATE

10.1.2.2.1.1 Attributes

Attribute Name	Tag	Usage SCU
Image Display Format	(2010,0010)	M
Referenced Film Session Sequence	(2010,0500)	M
>Referenced SOP Class UID	(0008,1150)	M
>Referenced SOP Instance UID	(0008,1155)	M
Referenced Image Box Sequence	(2010,0510)	Used (Received)
>Referenced SOP Class UID	(0008,1150)	Used (Received)
>Referenced SOP Instance UID	(0008,1155)	Used (Received)
Referenced Basic Annotation Box Sequence	(2010,0520)	Not used
>Referenced SOP Class UID	(0008,1150)	Not used
>Referenced SOP Instance UID	(0008,1155)	Not used
Film Orientation	(2010,0040)	Used
Film Size ID	(2010,0050)	Used
Magnification Type	(2010,0060)	Used
Max Density	(2010,0130)	Used. Not sent if -1
Configuration Information	(2010,0150)	Used. Not sent if empty
Annotation Display Format ID	(2010,0030)	Not used
Smoothing Type	(2010,0080)	Used. Not sent if magnification different from CUBIC
Border Density	(2010,0100)	Used Not sent if empty
Empty Image Density	(2010,0110)	Used Not sent if empty
Min Density	(2010,0120)	Used Not sent if -1
Trim	(2010,0140)	Used Not sent if empty

10.1.2.2.1.2 Status

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Success	0000	Film Box successfully created	Association goes on
Warning	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	Treated as Success
Failure	C616	There is an existing Film Box that has not been printed and N-ACTION at the Film Session level is not supported. A new Film Box will not be created when a previous Film Box has not been printed.	Association is aborted

The association is aborted for all other status.

10.1.2.2.1.3 Behavior

There is no specific behavior.

10.1.2.2.2 N-DELETE

10.1.2.2.2.1 Behavior

The SCU uses the N-DELETE to request the SCP to delete the Basic Film Box SOP Instance hierarchy.

10.1.2.2.2.2 Status

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	0119	Class-instance conflict	Association aborted
	0210	Duplicate invocation	Association aborted
	0117	Invalid SOP instance	Association aborted
	0212	Mistyped argument	Association aborted
	0118	No such SOP Class	Association aborted
	0112	No such SOP Instance	Association aborted
	0110	Processing failure	Association aborted
	0213	Resource limitation	Association aborted
	0211	Unrecognized operation	Association aborted
Success	0000	Film session successfully deleted	Job successfully canceled
*	*	Any other status code.	Ignored

10.1.2.2.3 N-ACTION

N-ACTION is used to print the current film of the film session.

10.1.2.2.3.1 Attributes

Action Type Name	Action Type ID	Attribute	Tag	Usage SCU
Print	1	Referenced Print Job Sequence	(2100,0500)	Not used
		>Referenced SOP Class UID	(0008,1150)	Not used

		>Referenced SOP Instance UID	(0008,1155)	Not used

10.1.2.2.3.2 Status

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Success	0000	Film accepted for printing.	Next step describe in the sequencing of Real-World Activities paragraph is performed
Warning	B603	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	This case should not happen. This warning is considered as an error. Association is aborted.
Warning	B604	Image size is larger than image box size.	This case should not happen. Image will be demagnified by the printer.
Failure	C602	Unable to create Print Job SOP Instance; print queue is full	Appropriate message is returned to the user. Association is aborted.
	C604	Image position collision: multiple images assigned to single image position	Appropriate message is returned to the user. Association is aborted.
	C603	Image size is larger than image box size (by using the specified magnification value)	Appropriate message is returned to the user. Association is aborted.

Other warning status will suspend the current job

10.1.2.2.3.3 Behavior

SCU uses the N-ACTION to request the SCP to print one or more copies of a single film of the film session.

10.1.3 Image Box SOP Classes

10.1.3.1 Basic Grayscale Image Box SOP Class

The DICOM Print SCU AE supports the following DIMSE Service Element for the Basic Grayscale Image Box SOP Class.

- The N-SET DIMSE Service element sent by the DICOM Print SCU AE requests the Remote DICOM Print SCP to set the attributes of the Basic Grayscale Image Box Instance.

10.1.3.1.1 IOD description

10.1.3.1.1.1 IOD modules

Module	Reference	Module Description
SOP Common		Contains SOP Common information
Image Box Pixel Presentation Module	10.1.3.1.1.2	Contains Image Box presentation information
Image Box Relationship Module	10.1.3.1.1.3	References to related SOPs

10.1.3.1.1.2 Image Box Pixel Presentation Module

Attribute Name	Tag	Attribute Description
Image Position	(2020,0010)	Value depends of the position within the Film box (1-N)
Polarity	(2020,0020)	NORMAL = pixels shall be printed as specified by the Photometric Interpretation (0028,0004) REVERSE = pixels shall be printed with the opposite polarity as specified by the Photometric Interpretation (0028,0004) Default value: NORMAL (Depending of default configuration)
Magnification Type	(2010,0060)	Same value as defined in the Film box
Smoothing Type	(2010,0080)	Same value as defined in the Film box
Configuration Information	(2010,0150)	Same value as defined in the Film Box.
Requested Image Size	(2020,0030)	Used (specified by the application), not sent if empty
Requested Decimate/Crop Behavior	(2020,0040)	Used (specified by the application), not sent if empty
Basic Grayscale Image Sequence	(2020,0110)	This sequence is always included if the Image Box is a Basic Grayscale Image Box
>Samples Per Pixel	(0028,0002)	1
>Photometric Interpretation	(0028,0004)	MONOCHROME1 or MONOCHROME2 depending of default configuration. Default value: MONOCHROME2
>Rows	(0028,0010)	Original image height
>Columns	(0028,0011)	Original image width
>Pixel Aspect Ratio	(0028,0034)	1\1
>Bits Allocated	(0028,0100)	Depends on the image pixel depth (8 or 16)
>Bits Stored	(0028,0101)	Depends on the image pixel depth (8, 12 bits)
>High Bit	(0028,0102)	Depends on the image pixel depth (7, 11)
>Pixel Representation	(0028,0103)	0 (Unsigned Integer)
>Pixel Data	(7FE0,0010)	
Original Image Sequence	(2130,00C0)	Not sent

10.1.3.1.1.3 Image Box Relationship Module

Attribute Name	Tag	Attribute Description
Referenced Image Sequence	(0008,1140)	Not used
>Referenced SOP Class UID	(0008,1150)	Not used
>Referenced SOP Instance UID	(0008,1155)	Not used
>Referenced Frame Number	(0008,1160)	Not used
Referenced Image Overlay Box Sequence	(2020,0130)	Not used
>Referenced SOP Class UID	(0008,1150)	Not used
>Referenced SOP Instance UID	(0008,1155)	Not used
>Referenced Frame Number	(0008,1160)	Not used
Referenced VOI LUT Sequence	(2020,0140)	Not used
>Referenced SOP Class UID	(0008,1150)	Not used
>Referenced SOP Instance UID	(0008,1155)	Not used

10.1.3.1.2 DIMSE Service Group

DIMSE Service Element	Usage SCU
N-SET	M

10.1.3.1.2.1 N-SET

10.1.3.1.2.1.1 Attributes

Attribute Name	Tag	Usage SCU
Image Position	(2020,0010)	M
Preformatted Grayscale Image Sequence	(2020,0110)	M
>Samples Per Pixel	(0028,0002)	M
>Photometric Interpretation	(0028,0004)	M
>Rows	(0028,0010)	M
>Columns	(0028,0011)	M
>Pixel Aspect Ratio	(0028,0034)	1\1
>Bits Allocated	(0028,0100)	M
>Bits Stored	(0028,0101)	M
>High Bit	(0028,0102)	M
>Pixel Representation	(0028,0103)	M
>Pixel Data	(7FE0,0010)	M
Polarity	(2020,0020)	Used
Magnification Type	(2010,0060)	Used
Smoothing Type	(2010,0080)	Used, not sent if magnfication is different of CUBIC
Configuration Information	(2010,0150)	Used, not sent if empty
Requested Image Size	(2020,0030)	Not used

10.1.3.1.2.1.2 Status

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	C603	Image size is larger than image box size	Appropriate message is returned to the user. Association is aborted.
	C605	Insufficient memory in printer to store the image	Appropriate message is returned to the user. Association is aborted.
	C613	Combined Print Image size is larger than the Image Box size	Appropriate message is returned to the user. Association is aborted.
	0119	Class-instance conflict	Generic error message is returned to the user. Association is aborted.
	0210	Duplicate invocation	Generic error message is returned to the user. Association is aborted.
	0106	Invalid attribute value	Generic error message is returned to the user. Association is aborted.
	0212	Mistyped argument	Generic error message is returned to the user. Association is aborted.
	0117	Invalid SOP instance	Generic error message is returned to the user. Association is aborted.
	0121	Missing attribute value	Generic error message is returned to the user. Association is aborted.
	0105	No such attributes	Generic error message is returned to the user. Association is aborted.
	0118	No such SOP Class	Generic error message is returned to the user. Association is aborted.
	0112	No such SOP Instance	Generic error message is returned to the user. Association is aborted.
	0110	Processing failure	Generic error message is returned to the user. Association is aborted.

	0213	Resource limitation	Generic error message is returned to the user. Association is aborted.
	0211	Unrecognized operation	Generic error message is returned to the user. Association is aborted.
Warning	B604	Image size larger than image box size, the image has been demagnified.	Following printing choice (true size), the warning can be ignored (Association goes on) or considered as a failure (Association is aborted)
	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	Considered as Success
	B609	Image size is larger than the Image Box size. The Image has been cropped to fit.	Following printing choice (true size), the warning can be ignored (Association goes on) or considered as a failure (Association is aborted)
	B60A	Image size or Combined Print Image size is larger than the Image Box size. The Image or Combined Print Image has been decimated to fit.	Following printing choice (true size), the warning can be ignored (Association goes on) or considered as a failure (Association is aborted)
Success	0000	Image successfully stored in Image Box	Association goes on
*	*	Any other status code.	Ignored

10.1.3.1.2.1.3 Behavior

There is no specific behavior.

10.1.3.2 Basic Color Image Box SOP Class

The DICOM Print SCU AE supports the following DIMSE Service Element for the Color Image Box SOP Class.

- The N-SET DIMSE Service element sent by the DICOM Print SCU AE requests the Remote DICOM Print SCP to set the attributes of the Color Image Box Instance.

10.1.3.2.1 IOD description

10.1.3.2.1.1 IOD modules

Module	Reference	Module Description
SOP Common		Contains SOP Common information
Image Box Pixel Presentation Module	10.1.3.2.1.2	Contains Image Box presentation information
Image Box Relationship Module	10.1.3.2.1.3	References to related SOPs

10.1.3.2.1.2 Image Box Pixel Presentation Module

Attribute Name	Tag	Attribute Description
Image Position	(2020,0010)	Value depends of the position within the Film box (1-N)
Polarity	(2020,0020)	NORMAL
Magnification Type	(2010,0060)	Same value as defined in the Film box
Smoothing Type	(2010,0080)	Same value as defined in the Film box
Configuration Information	(2010,0150)	Same value as defined in the Film Box.
Requested Image Size	(2020,0030)	Not sent
Requested Decimate/Crop Behavior	(2020,0040)	Not sent
Basic Color Image Sequence	(2020,0111)	This sequence is always included if the Image Box is a Basic Color Image Box
>Samples Per Pixel	(0028,0002)	3
>Photometric Interpretation	(0028,0004)	RGB
>Planar Configuration	(0028,0006)	1
>Rows	(0028,0010)	Original image height
>Columns	(0028,0011)	Original image width
>Pixel Aspect Ratio	(0028,0034)	1\1
>Bits Allocated	(0028,0100)	8
>Bits Stored	(0028,0101)	8
>High Bit	(0028,0102)	7
>Pixel Representation	(0028,0103)	0
>Pixel Data	(7FE0,0010)	
Original Image Sequence	(2130,00C0)	Not sent

10.1.3.2.1.3 Image Box Relationship Module

Attribute Name	Tag	Attribute Description
Referenced Image Sequence	(0008,1140)	Not used
>Referenced SOP Class UID	(0008,1150)	Not used
>Referenced SOP Instance UID	(0008,1155)	Not used
>Referenced Frame Number	(0008,1160)	Not used
Referenced Image Overlay Box Sequence	(2020,0130)	Not used

>Referenced SOP Class UID	(0008,1150)	Not used
>Referenced SOP Instance UID	(0008,1155)	Not used
>Referenced Frame Number	(0008,1160)	Not used
Referenced VOI LUT Sequence	(2020,0140)	Not used
>Referenced SOP Class UID	(0008,1150)	Not used
>Referenced SOP Instance UID	(0008,1155)	Not used

10.1.3.2.2 DIMSE Service Group

DIMSE Service Element	Usage SCU
N-SET	M

10.1.3.2.2.1 N-SET

10.1.3.2.2.1.1 Attributes

Attribute Name	Tag	Usage SCU
Image Position	(2020,0010)	M
Basic Color Image Sequence	(2020,0111)	M
>Samples Per Pixel	(0028,0002)	M
>Photometric Interpretation	(0028,0004)	M
>Planar Configuration	(0028,0006)	Used
>Rows	(0028,0010)	M
>Columns	(0028,0011)	M
>Pixel Aspect Ratio	(0028,0034)	1\1
>Bits Allocated	(0028,0100)	M
>Bits Stored	(0028,0101)	M
>High Bit	(0028,0102)	M
>Pixel Representation	(0028,0103)	M
>Pixel Data	(7FE0,0010)	M
Polarity	(2020,0020)	Used
Magnification Type	(2010,0060)	Used
Smoothing Type	(2010,0080)	Used. Not sent if magnfication is different of CUBIC
Configuration Information	(2010,0150)	Used, not sent if empty
Requested Image Size	(2020,0030)	Not used

10.1.3.2.2.1.2 Status

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes
Failure	C603	Image size is larger than image box size	Appropriate message is returned to the user. Association is aborted.
	C605	Insufficient memory in printer to store the image	Appropriate message is returned to the user.

			Association is aborted.
	C613	Combined Print Image size is larger than the Image Box size	Appropriate message is returned to the user. Association is aborted.
	0119	Class-instance conflict	Generic error message is returned to the user. Association is aborted.
	0210	Duplicate invocation	Generic error message is returned to the user. Association is aborted.
	0106	Invalid attribute value	Generic error message is returned to the user. Association is aborted.
	0212	Mistyped argument	Generic error message is returned to the user. Association is aborted.
	0117	Invalid SOP instance	Generic error message is returned to the user. Association is aborted.
	0121	Missing attribute value	Generic error message is returned to the user. Association is aborted.
	0105	No such attributes	Generic error message is returned to the user. Association is aborted.
	0118	No such SOP Class	Generic error message is returned to the user. Association is aborted.
	0112	No such SOP Instance	Generic error message is returned to the user. Association is aborted.
	0110	Processing failure	Generic error message is returned to the user. Association is aborted.
	0213	Resource limitation	Generic error message is returned to the user. Association is aborted.
	0211	Unrecognized operation	Generic error message is returned to the user. Association is aborted.
Warning	B604	Image size larger than image box size, the image has been demagnified.	Following printing choice (true size), the warning can be ignored (Association goes on) or

			considered as a failure (Association is aborted)
	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	Considered as Success
	B609	Image size is larger than the Image Box size. The Image has been cropped to fit.	Following printing choice (true size), the warning can be ignored (Association goes on) or considered as a failure (Association is aborted)
	B60A	Image size or Combined Print Image size is larger than the Image Box size. The Image or Combined Print Image has been decimated to fit.	Following printing choice (true size), the warning can be ignored (Association goes on) or considered as a failure (Association is aborted)
Success	0000	Image successfully stored in Image Box	Association goes on
*	*	Any other status code.	Ignored

10.1.3.2.2.1.3 Behavior

There is no specific behavior.

10.1.4 Printer SOP Class

The DICOM Print SCU AE supports the following DIMSE Service Element for the Basic Printer SOP Class.

The N-EVENT_REPORT DIMSE Service element sent by the DICOM Print SCP to the local DICOM Print SCU AE is supported in condition that the DICOM_PRINT_WAIT_SCP_EVENT environment variable is set. The DICOM Print SCU handles the Printer Status and Printer Status Info fields. All other received data are ignored.

The N-GET DIMSE Service element sent by the DICOM Print SCU AE requests the Remote DICOM Print SCP to give information on the Remote DICOM Printer.

10.1.4.1 IOD Description

10.1.4.1.1 IOD modules

Module	Reference	Module Description
SOP Common		Contains SOP Common information
Printer Module	10.1.4.1.2	Contains status information to monitor the printer

10.1.4.1.2 Printer Module

Attribute Name	Tag	Attribute Description

Printer Status	(2110,0010)	The behaviour defined for the following term NORMAL: Association goes on. FAILURE: Association is aborted. WARNING: Association is not released
Printer Status Info	(2110,0020)	Printer return value
Printer Name	(2110,0030)	Printer return value
Manufacturer	(0008,0070)	Printer return value if not empty
Manufacturer Model Name	(0008,1090)	Printer return value if not empty
Device Serial Number	(0018,1000)	Printer return value if not empty
Software Versions	(0018,1020)	Printer return value if not empty
Date Of Last Calibration	(0018,1200)	Printer return value if not empty
Time Of Last Calibration	(0018,1201)	Printer return value if not empty

10.1.4.2 DIMSE Service Group

DIMSE Service Element	Usage SCU
N-EVENT-REPORT	M
N-GET	U

10.1.4.2.1 N-EVENT-REPORT

10.1.4.2.1.1 Attributes

Event Type Name	Event Type ID	Attribute	Tag	Usage SCU
Normal	1	Printer Name	(2110,0030)	Used
		Printer Status Info	(2110,0020)	Used
Warning	2	Printer Name	(2110,0030)	Used
		Printer Status Info	(2110,0020)	Used
Failure	3	Printer Name	(2110,0030)	Used
		Printer Status Info	(2110,0020)	Used

10.1.4.2.1.2 Behavior

On reception Failure status, the Print SCU aborts the association.

If Printer Status is FAILURE
    Signal print failure to the user, association is aborted
Else If Printer Status is WARNING
    Signal print warning to the user
Else
    Signal print success to the user

In all cases, N-EVENT-REPORT_RSP with the status of Success is returned

10.1.4.2.2 N-GET

10.1.4.2.2.1 Attributes

Attribute name	Tag	Usage SCU
Printer Status	(2110,0010)	Used
Printer Status Info	(2110,0020)	Used
Printer Name	(2110,0030)	Used if return by he printer
Manufacturer	(0008,0070)	Used if return by he printer
Manufacturer Model Name	(0008,1090)	Used if return by he printer
Device Serial Number	(0018,1000)	Used if return by he printer
Software Versions	(0018,1020)	Used if return by he printer
Date Last Calibration	(0018,1200)	Used if return by he printer
Last Calibration	(0018,1201)	Used if return by he printer

10.1.4.2.2.2 Behavior

If Printer Status is FAILURE
    Signal print failure to the user, association aborted
Else If Printer Status is WARNING
    Signal print warning to the user
Else
    Signal print success to the user

In case of FAILURE or WARNING, the Printer Status Info is displayed to user under a readable message