



PACSgear Enterprise Server  
DICOM Conformance Statement

ENG-CS-DCS-RevG

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## Revision History

<b>Date</b>	<b>Rev</b>	<b>Authors</b>	<b>Description</b>
12-JUL-2016	A	Abdul Khatri	First draft
05-AUG-2016	B	Abdul Khatri	Revision B Fixed SOP for video, removed trademark, and updated copyright.
29-SEPT-2016	C	Andrew Robinson Cheryl Hawkins	Revision C Fixed minor typos and formatting issues, removed trademark, and updated copyright.
08-SEPT-2018	D	Tammy Matthews	Revision D Updated trademark and copyright.
20-NOV-2018	E	Tammy Matthews	Revision E Rebranded to Hyland
19-June-20	F	Julie Clements	Revision F Changed to Enterprise Server and updated the layout.
26-OCT-2020	G	Andrew Robinson Abdul Khatri	Revision G Added 'HEVC/H.265 Main Profile' to supported transfer syntax.

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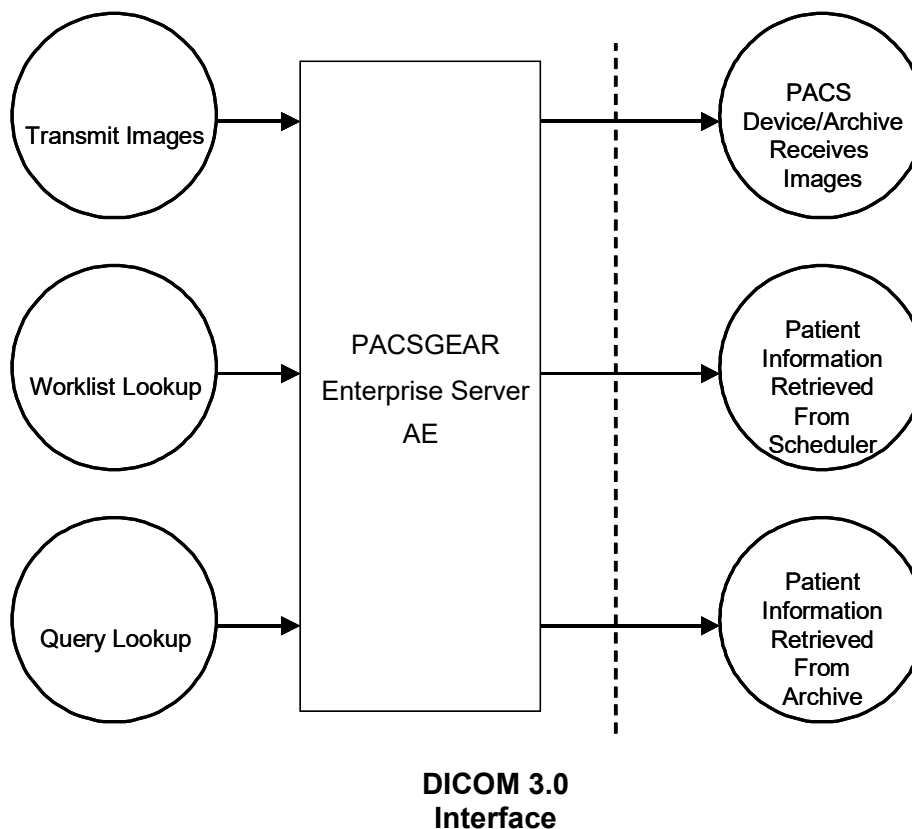
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## Introduction

This conformance statement is designed to communicate technical information regarding the PACSgear Enterprise Server product and its compliance to the DICOM 3.0 standard. PACSgear Enterprise Server is designed to receive metadata, photos and videos from a PACSGEAR Suite Client and send to any PACS or VNA via DICOM, HL7 or XDS. Patient demographics are either entered by the user, or can be selected using DICOM Modality Worklist functionality or DICOM Study Root Query/Retrieve-Find functionality.

## Implementation Model

### Application Data Flow Diagram



**Figure 1. PACSgear Enterprise Server Implementation Model**

PACSgear Enterprise Server is used to receive clinical images or videos from a PACSGEAR Suite Client and transmit them to a PACS device via DICOM, HL7 or XDS. Patient demographic information can be entered manually, or it can be downloaded from an external scheduling system via DICOM Modality Worklist or an archive via DICOM Study Root Query/Retrieve (Q/R) -Find requests.

### Functional Definition of Application Entity

The PACSgear Enterprise Server Application Entity (AE) supports the following three SCU functions (one at a time):

- **Transmit Images** – This AE is responsible for the management of DICOM Storage SCU activities.
- **Worklist Lookup** – This AE provides patient demographic and study information lookups utilizing DICOM Modality Worklist requests as an SCU.
- **Query Lookup** – This AE provides patient demographic and study information lookups utilizing DICOM Study Root Q/R-Find requests as an SCU.

## Sequencing of Real-World Activities

Not Applicable.

## AE Specifications

### PACSGEAR Enterprise Server AE Specifications

The PACSGEAR Enterprise Server AE provides Standard Conformance to the following DICOM 3.0 SOP Classes as an SCU.

SOP Class Name	SOP Class UID
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Modality Worklist	1.2.840.10008.5.1.4.31
Study Root Q/R Information Model – Find	1.2.840.10008.5.1.4.1.2.2.1

Figure 2. PACSGEAR Enterprise Server SOP Classes

## Association Establishment Policies

### General

The maximum PDU size for any association establishment that is offered is 16 Kbytes.

### Number of Associations

The PACSgear Enterprise Server AE can establish one or more associations depending on number of jobs being performed.

### Asynchronous Nature

The PACSgear Enterprise Server AE does not support asynchronous communication.

## Implementation Identifying Information

The implementation identifying information for this DICOM 3.0 implementation is:

Implementation Class UID	1.3.6.1.4.1.23849.1
Version Name	PACSGEAR_v3

Figure 3. Implementation Identifying Information

## Association Initiation by Real-World Activity

### Real-World Activity – Transmit Images

#### Associated Real-World Activity

After a user has scanned, imported, acquired one or more images into the PACSgear Enterprise Server system, the user will then select the Send Button. The PACSgear Enterprise Server AE will request an association with a single configured AE. PACSgear Enterprise Server will then transmit all of the images over this association, and will request an association release.

#### Presentation Contexts

SOP Class Name	SOP Class UID	Transfer Syntax	Role	Extended Negotiation
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	See below	SCU	None

Figure 4. Presentation Context Table – Transmit Images

#### Transfer Syntax

The Transmit Images AE support the following transfer syntax list.

Transfer Syntax Name	Transfer Syntax UID
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
MPEG-4 AVC/H.264 High Profile / Level 4.1	1.2.840.10008.1.2.4.102
DICOM Implicit VR Little Endian	1.2.840.10008.1.2
HEVC/H.265 Main Profile / Level 5.1	1.2.840.10008.1.2.4.108

Figure 5. Transmit Images AE – Transfer Syntaxes Supported

#### SOP Specific Conformance for Image Storage

Standard conformance is provided to for the supported SOP Classes. For specific attributes utilized during the storage operation please refer to Appendix A for still images and Appendix B for video (MPEG-4).

### Real-World Activity – Worklist Lookup

#### Associated Real-World Activity

A user may query a DICOM Modality Worklist SCP and select a Worklist entry from which to populate the patient demographics within one or more images. When the user selects the Lookup button from within PACSgear Enterprise Server, the PACSgear Enterprise Server AE requests an association with a configured Worklist AE. PACSgear Enterprise Server will then issue a C-Find request that contains any of the search attributes entered by the user. The results are then presented to the user for selection. Once a patient is selected the corresponding worklist attributes are downloaded into the patient entry form.

#### Presentation Contexts



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

Figure 6. Presentation Contexts – Worklist Lookup

**SOP Specific Conformance for Modality Worklist Management**

Standard conformance is provided to the DICOM Modality Worklist Management Service Class. For specific fields that are issued during the Modality Worklist C-Find request please refer to Appendix B.

Real-World Activity – Query Lookup

**Associated Real-World Activity**

A user may query a DICOM Query/Retrieve SCP and select a patient from which to populate the patient demographics within one or more images. When the user selects the Lookup button from within PACSgear Enterprise Server, the PACSgear Enterprise Server AE requests an association with a configured Q/R SCP AE. PACSgear Enterprise Server will then issue a C-Find request that contains any of the search attributes entered by the user. The results are then presented to the user for selection. Once a patient is selected the corresponding attributes are downloaded into the patient entry screen.

**Presentation Contexts**

Presentation Context Table				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Study Root Query/Retrieve Information Model – Find	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	SCU	None

Figure 7. Presentation Contexts – Query Lookup

**SOP Specific Conformance for Study Root Query/Retrieve**

Standard conformance is provided to the DICOM Study Root Q/R Service Class. For specific fields that are issued during the C-Find request please refer to Appendix C.

Association Acceptance Policy

The PACSgear Enterprise Server product does not accept incoming associations.

## Communication Profiles

### Supported Communication Stacks

The PACSgear Enterprise Server AE provides DICOM 3.0 TCP/IP Network Communication Support as defined in PS 3.8.

### TCP/IP Stack

The PACSgear Enterprise Server AE implements DICOM 3.0 on top of the Windows TCP/IP stack.

### Physical Media Support

The PACSgear Enterprise Server AE is indifferent to the physical medium over which TCP/IP executes.

## Extension/Specialization/Privatization

Not Applicable.

## Configuration

The following fields are configurable for the PACSgear Enterprise Server AE:

- Local AE Title
- Remote Storage AE Title
- Remote Storage IP Address
- Remote Storage Port
- Field that determines if the Lookup operation utilizes DICOM Worklist Management or Query/Retrieve services.
- Lookup Provider AE Title
- Lookup Provider IP Address
- Lookup Provider Port
- Lookup Study Date Range
- Institution
- Department
- Station Name
- Manufacturer
- Model
- Serial #
- Version #
- Series Number

- Video Support
- Image Quality
- Video Quality

Please, note that one or more remote storage locations may be configured.

## Extended Character Sets

Not Applicable.

## Appendix A: Attribute List for DICOM Storage SCU for Still Images

This list contains the DICOM attributes that are used by the PACSgear Enterprise Server AE when issuing a DICOM Storage request as an SCU.

DICOM Attribute	Comment
(0008,0008) Image Type	ORIGINAL\SECONDARY
(0008,0016) SOP Class UID	1.2.840.10008.5.1.4.1.1.7 (Secondary Capture)
(0008,0018) SOP Instance UID	
(0008,0020) Study Date	
(0008,0022) Acquisition Date	
(0008,0023) Content Date	
(0008,002A) Acquisition Date/Time	
(0008,0030) Study Time	
(0008,0032) Acquisition Time	
(0008,0033) Content Time	
(0008,0050) Accession Number	
(0008,0060) Modality	Selected by the user or set with Modality Worklist value
(0008,0064) Conversion Type	WSD
(0008,0070) Manufacturer	Configurable
(0008,0080) Institution	Configurable
(0008,0090) Referring Physician	Set when received via worklist or cfind query
(0008,1010) Station Name	Configurable (Client Device Name)
(0008,1030) Study Description	Entered/Selected by the PACSgear Enterprise Server user
(0008,103e) Series Description	Entered/Selected by the PACSgear Enterprise Server user
(0008,1040) Institutional Department Name	Configurable
(0008,1070) Operators Name	Configurable (user login name)
(0008,1090) Manufacturer Model Name	Configurable
(0010,0010) Patient Name	
(0010,0020) Patient ID	Image may not be sent without this value
(0010,0030) Patient Birthdate	
(0010,0040) Patient Sex	
(0018,1000) Acq. Device Serial Number	Configurable
(0018,1012) Date of Secondary Capture	
(0018,1014) Time of Secondary Capture	
(0018,1016) Secondary Capture Device Manufacturer	HYLAND

(0018,1018) Secondary Capture Device Model Name	PACSGear Enterprise Server
(0018,1019) Secondary Capture Device Software Version	3.0.0
(0018,1020) Acq. Software Version	Configurable
(0018,1023) Digital Image Format Acquired	
(0020,000D) Study Instance UID	
(0020,000E) Series Instance UID	
(0020,0010) Study ID	
(0020,0011) Series Number	Configurable
(0020,0013) Image Number	
(0020,0020) Patient Orientation	
(0028,0002) Samples Per Pixel	3
(0028,0004) Photometric Interpretation	YBR_FULL_422 or RGB
(0028,0006) Planar Configuration	0
(0028,0010) Rows	
(0028,0011) Columns	
(0028,0100) Bits Allocated	8
(0028,0101) Bits Stored	8
(0028,0102) High Bit	7
(0028,0103) Pixel Representation	0
(7FE0,0010) Pixel Data	

**Figure 8. DICOM Storage SCU Attribute List (Secondary Capture still images)**

## Appendix B: Attribute List for DICOM Storage SCU for MPEG-4 Images

This list contains the DICOM attributes that are used by the PACSgear Enterprise Server AE when issuing a DICOM Storage request as an SCU for MPEG-4 images.

DICOM Attribute	Comment
(0008,0008) Image Type	ORIGINAL\SECONDARY
(0008,0016) SOP Class UID	1.2.840.10008.5.1.4.1.1.77.1.4.1 (Secondary Capture)
(0008,0018) SOP Instance UID	
(0008,0020) Study Date	
(0008,0022) Acquisition Date	
(0008,0023) Content Date	
(0008,002A) Acquisition Date/Time	
(0008,0030) Study Time	
(0008,0032) Acquisition Time	
(0008,0033) Content Time	
(0008,0050) Accession Number	
(0008,0060) Modality	Selected by the user or set with Modality Worklist value
(0008,0064) Conversion Type	WSD
(0008,0070) Manufacturer	Configurable
(0008,0080) Institution	Configurable
(0008,0090) Referring Physician	Set when received via worklist or cfind query
(0008,1010) Station Name	Configurable (iOS Device Name)
(0008,1030) Study Description	Entered/Selected by the PACSgear Enterprise Server user
(0008,103e) Series Description	Entered/Selected by the PACSgear Enterprise Server user
(0008,1040) Institutional Department Name	Configurable
(0008,1070) Operators Name	Configurable (user login name)
(0008,1090) Manufacturer Model Name	Configurable
(0010,0010) Patient Name	
(0010,0020) Patient ID	Image may not be sent without this value
(0010,0030) Patient Birthdate	
(0010,0040) Patient Sex	
(0018,1000) Acq. Device Serial Number	Configurable
(0018,1012) Date of Secondary Capture	
(0018,1014) Time of Secondary Capture	

(0018,1016) Secondary Capture Device Manufacturer	HYLAND
(0018,1018) Secondary Capture Device Model Name	PACSGear Enterprise Server
(0018,1019) Secondary Capture Device Software Version	3.0.0
(0018,1020) Acq. Software Version	Configurable
(0018,1023) Digital Image Format Acquired	
(0020,000D) Study Instance UID	
(0020,000E) Series Instance UID	
(0020,0010) Study ID	
(0020,0011) Series Number	Configurable
(0020,0013) Image Number	
(0020,0020) Patient Orientation	
(0028,0002) Samples Per Pixel	3
(0028,0004) Photometric Interpretation	YBR_PARTIAL_420
(0028,0006) Planar Configuration	0
(0028,0010) Rows	
(0028,0011) Columns	
(0028,0100) Bits Allocated	8
(0028,0101) Bits Stored	8
(0028,0102) High Bit	7
(0028,0103) Pixel Representation	0

**Figure 9. DICOM Storage SCU Attribute List (MPEG-4 transfer syntax)**

## Appendix C: Attribute List for DICOM Modality Worklist Management Requests

This table contains the DICOM attributes that are used by the PACSgear Enterprise Server AE when issuing a DICOM Modality Worklist request.

DICOM Attribute	Comment
(0008,0050) Accession Number	User may attempt an exact match
(0008,0090) Referring Physician's Name	
(0010,0010) Patient Name	User may narrow the search
(0010,0020) Patient ID	User may attempt an exact match
(0010,0030) Patient Birthdate	
(0010,0040) Patient Sex	
(0020,000D) Study Instance UID	
(0032,1064) Requested Procedure Code Sequence	
(0040,0100) Scheduled Procedure Step Sequence	
>(0008,0100) Code Value	
>(0008,0060) Modality	User may search for a specific modality
>(0040,0002) Scheduled Procedure Step Start Date	The product can be configured to always perform a date range query
>(0040,0003) Scheduled Procedure Step Start Time	
>(0040,0007) Scheduled Procedure Step Description	

Figure 10. DICOM Modality Worklist Attributes



## Appendix D: Attribute List for DICOM Q/R C-FIND Requests

This table contains the DICOM keys that are used by the PACSgear Enterprise Server AE when issuing a DICOM Q/R C-FIND request. The C-FIND request will always use the Study Root Information model.

DICOM Attribute	Comment
(0008,0020) Study Date	The product can be configured to always perform a date range query
(0008,0030) Study Time	
(0008,0050) Accession Number	User may attempt an exact match
(0008,0052) Query/Retrieve Level	The value is always "STUDY"
(0008,0060) Modality	User may search for a specific modality (Not sent unless specifically configured)
(0008,0061) Modalities in Study	User may search for a specific modality
(0008,0090) Referring Physician's Name	
(0008,1030) Study Description	
(0010,0010) Patient Name	User may narrow the search
(0010,0020) Patient ID	User may attempt an exact match
(0010,0030) Patient Birth Date	
(0010,0040) Patient Sex	
(0020,000D) Study Instance UID	

Figure 11. DICOM Q/R C-FIND Attributes