



Visbion Limited

DicomConnector 3.7 DICOM Conformance Statement

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Date	Document Version	Author	Comments
7/10/05	0.1	Simon Burnham	Initial Draft. Added 'Stereometric Relationship Storage', 'Ophthalmic Photography 8 Bit Image Storage' and 'Ophthalmic Photography 16 Bit Image Storage' to SCU and SCP tables in 2.2 <i>DicomConnector AE Specification</i> , to Proposed Presentation Context Table in 2.2.2.1 <i>Send Image(s) to Remote AE</i> , to Accepted Presentation Context Table in 2.2.3.2 <i>Receive Image(s) from Remote AE</i> and to Accepted Presentation Context Table in 2.2.3.5 <i>Retrieve Request from Remote AE</i> .
18/10/05	0.2	Simon Burnham	Functional Review. No comments.
19/10/05	0.3	Simon Burnham	Proofreading Review. Changes made: Edited last sentence in last paragraph in 1 <i>Foundation Technology</i> . In second bullet of 2.1.2 <i>Functional Definition of Application Entities</i> , added comma after 'updated'. In 2.2 <i>DicomConnector AE Specification</i> , changes 'storage' to initial caps in third row of first table. In first table of 2.2.2.1 <i>Send Image(s) to Remote AE</i> , removed extra space in fifth row. In 2.2.2.3 <i>Request for Storage Commitment Push Model N-ACTION</i> , reduced size of colon in line between third and fourth tables. Edited second paragraph in 2.2.3.8 <i>Request for Modality Performed Procedure Step N-CREATE</i> and 2.2.3.9 <i>Request for Modality Performed Procedure Step N-SET</i> . Global changes: removed 'the' from 'the DicomConnector' and added hyphen to 'sub-operation'.
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25 Jan 2006	1.1	Simon Burnham	Late change: Added Important note to 2.2.3.2 <i>Receive Image(s) from Remote AE</i> .
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7 Dec 2006	3	Stefan Claesen	Updated templates to Visbion Ltd

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1. Foundation Technology

Visbion's solutions provide a fully-integrated patient information environment based upon industry standard web technology. At the heart is a central information system in which all patient records are held. As the majority of today's medical imaging equipment makes use of the Digital Imaging and Communications in Medicine (DICOM) 3.0 standard for information interchange, Visbion's solutions have been developed to connect directly to DICOM 3.0 compliant equipment. This enables a patient's medical images to be incorporated directly within their medical record. The system complies fully with the Health Insurance Portability and Accountability Act (HIPAA) requirements and integrates seamlessly with Health Level Seven (HL7) and DICOM 3.0 conformant systems. Options are also included to enable data to be incorporated into patient records from a wide range of other sources. For example, text-based documents can be incorporated using standard TWAIN-compliant document scanners.

Visbion's solutions have been designed and developed using industry standard technology. Any computer with a frame-capable web browser can be connected to the system. Customers do not require dedicated hardware for each potential system user. Furthermore, despite ease of access to patient records, security of information and patient confidentiality has been a high priority in the development of the suite of products. The systems make use of similar security protocols to those employed by online banks and the military, of which some make use of usernames and passwords for access, data encryption and automatic dial-back capabilities.

1.1 Scope

This document states the conformance of Visbion's DICOM technology to the DICOM 3.0 standard. The document has been written for software developers and system integrators who are interested in integrating Visbion's products with existing DICOM 3.0 conformant devices.

It is assumed that those reading this document are familiar with the concepts and terminology used within the DICOM 3.0 standard. Readers who require further information on the DICOM 3.0 standard should note that a complete copy of the standard can be obtained from:

Address: National Electrical Manufacturers Association
 NEMA Publications
 1300 North 17th Street
 Suite 1847
 Rosslyn
 VA 22209
 USA.
Tel: +1 (703) 841 3200

1.2 Definitions

DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DICOM Message Service Element with Composite Information Objects

1.3 Abbreviations

ACR	American College of Radiology
AE	Application Entity
ASCII	American Standard Code for Information Interchange
DNS	Domain Name System
HIPAA	Health Insurance Portability and Accountability Act
HIS	Hospital Information System
HL7	Health Level Seven
HSS	Healthcare Software Systems
IEEE	Institute of Electrical and Electronics Engineers
IOD	Information Object Definition
IP	Internet Protocol
ISO	International Organization for Standardization
JPEG	Joint Photographic Experts Group
NEMA	National Electrical Manufacturers Association
OSI	Open Systems Interconnection
RIS	Radiology Information System
PDU	Protocol Data Unit
SCU	Service Class User (DICOM Client)
SCP	Service Class Provider (DICOM Server)
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identification

1.4 Connectivity and Interoperability

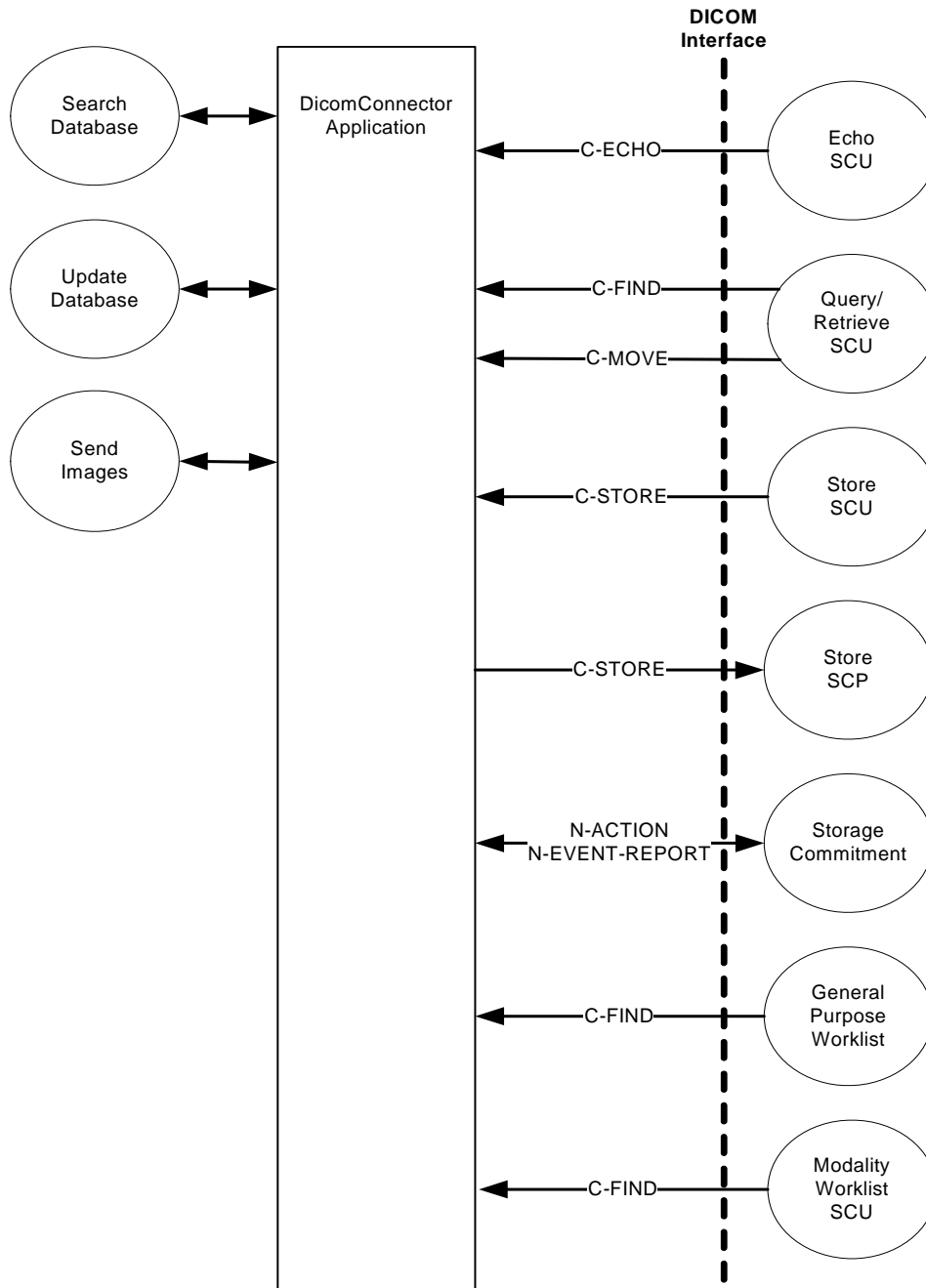
The implementation of the Visbion DICOM interface has been carefully tested to ensure compliance with this Conformance Statement. However, the Conformance Statement and the DICOM standard does not guarantee interoperability of Visbion's products and modalities of other vendors. The user must compare the relevant Conformance Statements and if a successful association is established, the user is responsible for testing and validating the interoperability that is required.

2. DicomConnector Conformance Statement

2.1 Implementation Model

2.1.1 Application Data Flow Diagram

The basic and specific application models for Visbion DicomConnector are shown in the diagram below:



There is no real-world activity that will cause the DicomConnector Application Entity (AE) to initiate an association to a remote DICOM Application Entity. However, the DicomConnector AE may initiate associations triggered by the internal workflow engine.

There is no real-world activity required for the DicomConnector AE to respond to an incoming DICOM store, query/retrieve, verify or worklist request. The DicomConnector AE is always prepared to respond to an incoming request from any remote DICOM AE.

2.1.2 Functional Definition of Application Entities

DicomConnector is the Application Entity that is the interface for the Visbion database.

It supports the following service classes:

Service Class	Role
Verification	SCP + SCU
Storage	SCP + SCU
Query	SCP
Retrieve	SCP + SCU
General Purpose Worklist Management	SCP
Modality Worklist	SCP
Storage Commitment Push Model	SCP + SCU

The DicomConnector AE waits for association requests from remote AEs that wish to perform the following operations:

- **Verification:** If a C-ECHO request is received, the DicomConnector AE will send back a C-ECHO response with a status of "success".
- **Storage:** If a C-STORE request is received, the DicomConnector AE will receive the image and try to update the local Visbion PACS database. If the image is stored successfully on storage media and the database updated, a status of "success" will be returned in a C-STORE response.
- **Query:** If a C-FIND request is received, the DicomConnector AE will search the database for the requested attributes and send back a C-FIND response containing a match and a status of "pending". After all matching records have been sent, a status of "success" will be returned in a C-FIND response.
- **Retrieve:** If a C-MOVE request is received, the DicomConnector AE will look up a list of configured remote AEs for the Destination AE. If the Destination AE is configured, DicomConnector will open a new association to the Destination AE and use C-STORE request(s) to send the image(s). The DicomConnector AE will send a C-MOVE response with a status of "pending" as each image is sent. When all images are sent a final C-STORE response will be sent back with an appropriate status.
- **General Purpose Worklist Management:** Once the username and password have been verified and a C-FIND request is received, the DicomConnector AE will search the database for the requested attributes and send back a C-FIND response containing a match and a status of "pending". After all matching records have been sent, a status of "success" will be returned in a C-FIND response.
- **Modality Worklist:** If a C-FIND request for Modality Worklist (MWL) is received, the DicomConnector AE will search the database for the requested attributes and send back a C-FIND response containing a match and a status of "pending". After all matching records have been sent, a status of "success" will be returned in a C-FIND response. If the AE of a modality workstation is not authorised, then no work items will be returned to that modality when a C-FIND for MWL is performed and an error code of C008 (Scheduled Station AE unknown) will be returned.
- **Storage Commitment Push Model:** If an N-ACTION request is received, the DicomConnector AE will verify that the images listed in the request have been reliably stored and send a corresponding N-EVENT-REPORT back to the SCU. When a storage report event (N-EVENT-REPORT) is received, DicomConnector will mark the images as committed or not committed as per the report. Committed images become candidates for deletion. Those images that are not committed will require intervention to resolve any problems.

2.1.3 Sequencing of Real-World Activities

This is not applicable to the DicomConnector AE.

2.2 DicomConnector AE Specification

The DicomConnector AE provides standard conformance to the following DICOM 3.0 SOP Classes as a SCU:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Storage Commitment Push Model	1.2.840.10008.1.20.1
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
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
Digital Intra-oral X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra-oral X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.3.1
Computed Tomography (CT) Image Storage	1.2.840.10008.5.1.4.1.1.2
Magnetic Resonance (MR) Image Storage	1.2.840.10008.5.1.4.1.1.4
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
12-Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Haemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11
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

SOP Class Name	SOP Class UID
X-ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Visual Light (VL) Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1
VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
Positron Emission Tomography (PET) 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
Radiotherapy (RT) Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7
Patient Root Query/Retrieve Information Model – C-FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.1.2
Patient Root Query/Retrieve Information Model – C-GET	1.2.840.10008.5.1.4.1.2.1.3
Study Root Query/Retrieve Information Model – C-FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.2.2
Study Root Query/Retrieve Information Model – C-GET	1.2.840.10008.5.1.4.1.2.2.3
Patient/Study Only Query/Retrieve Information Model – C-FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.3.2
Patient/Study Only Query/Retrieve Information Model – C-GET	1.2.840.10008.5.1.4.1.2.3.3

The DicomConnector AE provides standard conformance to the following DICOM 3.0 SOP Classes as a SCP:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Storage Commitment Push Model	1.2.840.10008.1.20.1
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
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
Digital Intra-oral X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra-oral X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.3.1
Computed Tomography Image Storage	1.2.840.10008.5.1.4.1.1.2
Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
12-Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Haemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11
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
X-ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1

SOP Class Name	SOP Class UID
VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
PET 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 Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7
Patient Root Query/Retrieve Information Model – C-FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.1.2
Patient Root Query/Retrieve Information Model – C-GET	1.2.840.10008.5.1.4.1.2.1.3
Study Root Query/Retrieve Information Model – C-FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.2.2
Study Root Query/Retrieve Information Model – C-GET	1.2.840.10008.5.1.4.1.2.2.3
Patient/Study Only Query/Retrieve Information Model – C-FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.3.2
Patient/Study Only Query/Retrieve Information Model – C-GET	1.2.840.10008.5.1.4.1.2.3.3
Modality Worklist Information Model – C-FIND	1.2.840.10008.5.1.4.31
General Purpose Worklist Information Model – C-FIND	1.2.840.10008.5.1.4.32.1

2.2.1 Association Establishment Policies

2.2.1.1 General

The DICOM Application Context Name, which is always proposed, is:

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

The maximum length of a PDU for an association initiated by the DicomConnector AE is 32KB.

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

SOP class Extended Negotiation is not supported.

2.2.1.2 Number of Associations

This Application Entity will accept simultaneous DICOM Associations at any point in time. The maximum number of associations is a configurable parameter.

2.2.1.3 Asynchronous Nature

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

2.2.1.4 Implementation Identifying Policy

The Implementation details for this DICOM 3.0 implementation are:

DicomConnector Implementation UID	1.2.826.0.1.3722626.2.1.50317
DicomConnector Implementation Version	SCDCM_50317

2.2.2 Association Initiation Policy

The DicomConnector AE attempts to initiate an association due to the C-MOVE sub-operation.

2.2.2.1 Send Image(s) to Remote AE

Associated Real-World Activity

Images can be sent to remote AEs using DicomConnector's forwarding mechanism. Events in the PACS system trigger this action which results in an entire study being sent to a configured remote AE using the DIMSE C-STORE service.

Proposed Presentation Context Table

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	Note 1	Note 1	SCU	None
Digital X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.1	Note 1	Note 1	SCU	None
Digital X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.1.1	Note 1	Note 1	SCU	None

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Digital Mammography X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.2	Note 1	Note 1	SCU	None
Digital Mammography X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.2.1	Note 1	Note 1	SCU	None
Digital Intra-oral X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.3	Note 1	Note 1	SCU	None
Digital Intra-oral X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.3.1	Note 1	Note 1	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Note 1	Note 1	SCU	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Note 1	Note 1	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Note 1	Note 1	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Note 1	Note 1	SCU	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Note 1	Note 1	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Note 1	Note 1	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Note 1	Note 1	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Note 1	Note 1	SCU	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Note 1	Note 1	SCU	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Note 1	Note 1	SCU	None
12-Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Note 1	Note 1	SCU	None

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Note 1	Note 1	SCU	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Note 1	Note 1	SCU	None
Haemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Note 1	Note 1	SCU	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Note 1	Note 1	SCU	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Note 1	Note 1	SCU	None
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Note 1	Note 1	SCU	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Note 1	Note 1	SCU	None
X-ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Note 1	Note 1	SCU	None
X-ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Note 1	Note 1	SCU	None
X-ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Note 1	Note 1	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Note 1	Note 1	SCU	None
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Note 1	Note 1	SCU	None
VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Note 1	Note 1	SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Note 1	Note 1	SCU	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Note 1	Note 1	SCU	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Note 1	Note 1	SCU	None

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Note 1	Note 1	SCU	None
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Note 1	Note 1	SCU	None
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Note 1	Note 1	SCU	None
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Note 1	Note 1	SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Note 1	Note 1	SCU	None
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	Note 1	Note 1	SCU	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Note 1	Note 1	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Note 1	Note 1	SCU	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Note 1	Note 1	SCU	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Note 1	Note 1	SCU	None
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Note 1	Note 1	SCU	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Note 1	Note 1	SCU	None
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Note 1	Note 1	SCU	None
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Note 1	Note 1	SCU	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

If the transfer syntax is encapsulated one of the following will apply:

Name	UID
JPEG Baseline (Process 1): Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 and 4): Lossy JPEG 12 Bit Image Compression	1.2.840.10008.1.2.4.51
JPEG Extended (Process 3 and 5) (Retired)	1.2.840.10008.1.2.4.52
JPEG Spectral Selection, Non-Hierarchical (Process 6 and 8) (Retired)	1.2.840.10008.1.2.4.53
JPEG Spectral Selection, Non-Hierarchical (Process 7 and 9) (Retired)	1.2.840.10008.1.2.4.54
JPEG Full Progression, Non-Hierarchical (Process 10 and 12) (Retired)	1.2.840.10008.1.2.4.55
JPEG Full Progression, Non-Hierarchical (Process 11 and 13) (Retired)	1.2.840.10008.1.2.4.56
JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical (Process 15) (Retired)	1.2.840.10008.1.2.4.58
JPEG Extended, Hierarchical (Process 16 and 18) (Retired)	1.2.840.10008.1.2.4.59
JPEG Extended, Hierarchical (Process 17 and 19) (Retired)	1.2.840.10008.1.2.4.60
JPEG Spectral Selection, Hierarchical (Process 20 and 22) (Retired)	1.2.840.10008.1.2.4.61
JPEG Spectral Selection, Hierarchical (Process 21 and 23) (Retired)	1.2.840.10008.1.2.4.62
JPEG Full Progression, Hierarchical (Process 24 and 26) (Retired)	1.2.840.10008.1.2.4.63
JPEG Full Progression, Hierarchical (Process 25 and 27) (Retired)	1.2.840.10008.1.2.4.64
JPEG Lossless, Hierarchical (Process 28) (Retired)	1.2.840.10008.1.2.4.65
JPEG Lossless, Hierarchical (Process 29) (Retired)	1.2.840.10008.1.2.4.66
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70
Run Length Encoding (RLE) Lossless	1.2.840.10008.1.2.5

If a C-STORE operation is terminated successfully, there is no effect upon the stored images.

If a C-STORE operation is terminated by an error, there is again no effect upon stored images.

If a warning terminates a C-STORE operation there is no effect upon stored images.

DicomConnector will only send optional and private data elements from stored images that it has previously received as a C-STORE Service Class Provider. The module will not add any new elements of its own.

2.2.2.2 Retrieve Request from Remote AE

The DicomConnector AE continuously listens for associations and no operator action is required for it to respond to a retrieve request.

Associated Real-World Activity

The associated real-world activity is the user retrieving an image or set of images from DicomConnector, usually after performing a query (DIMSE C-FIND). When a retrieve request (DIMSE C-MOVE) is received by DicomConnector, it initiates a new association to the remote AE and sends the requested image(s) using the DIMSE C-STORE service.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.1.2	Note 1	Note 1	SCP	None
Study Root Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.2.2	Note 1	Note 1	SCP	None
Patient/Study Only Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.3.2	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The DicomConnector AE initiates a separate association for each image requested in the C-MOVE request.

The table below describes the possible status codes that can be returned to the SCU device after the DicomConnector AE has completed the requested C-MOVE:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Success	0000	Sub-operation is complete	None
Refused	A701	Out of Resources – Unable to calculate number of matches	None
	A702	Out of Resources – Unable to perform sub-operations	None
	A801	Move destination unknown	None
Failed	A900	Identifier does not match SOP Class	None
	C000	Unable to process	None
Warning	B000	Sub-operations Complete – One or more Failures or Warnings	None
Cancel	FE00	Sub-operations terminated due to Cancel Indication	None
Pending	FF00	Sub-operations are continuing	None

Presentation Context Acceptance Criterion

The DicomConnector AE accepts any number of presentation contexts as listed in the Accepted Presented Context Table. The DicomConnector AE will reject any requests from remote AEs that are not known to it.

2.2.2.3 Request for Storage Commitment Push Model N-ACTION

The DICOM Integration Module AE continually listens for associations.

Associated Real-World Activity

Storage Commitment Push Model requests correspond to the verification of the storage of one or more images to a remote AE. DicomConnector can be configured to send these requests at appropriate time intervals. A Storage Commitment Push Model request comprises a N-ACTION request which contains one or more SOP instances to verify. This is sent to a remote AE, and an N-EVENT-REPORT is received at a later time over a separate association.

Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model – N-ACTION	1.2.840.10008.1.20.1	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The table below describes the possible status codes that can be returned to the SCU device after the DICOM Integration Module AE has completed the requested N-ACTION:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Failed	C000	Unable to process	None
Error	C001 – CFFF	Internal errors – please contact Visbion support	None
Error	A700	Failed to connect to database	None
Error	0110	Processing Failure	None
Error	0118	No Such SOP Class	None
Success	0000	Sub-operation is complete	None

The following attributes are supported in Storage Commitment Push Model Step N-ACTION requests:

Description	Type	Tag
Transaction UID	1	(0008, 1195)
Storage Media File-set ID	3	(0088, 0130)
Storage Media File-set UID	3	(0088, 0140)
Referenced SOP Sequence	1	(0008, 1199)
> Referenced SOP Class UID	1	(0008, 1150)
> Referenced SOP Instance UID	1	(0008, 1155)
> Storage Media File-set ID	3	(0088, 0130)
> Storage Media File-set UID	3	(0088, 0140)

The following attributes may be returned in a Storage Commitment Push Model Step N-ACTION response:

Description	Type	Tag
Command Field	1	(0000, 0100)
Action Type ID	3	(0000, 1008)
Message ID being responded to	1	(0000, 0120)
Status	1	(0000, 0900)
Affected SOP Class UID	1	(0000, 0002)
Affected SOP Instance UID	1	(0000, 1000)

2.2.2.4 Request for Storage Commitment Push Model Report N-EVENT-REPORT

The DICOM Integration Module AE continually listens for associations.

Associated Real-World Activity

Storage Commitment Push Model requests correspond to the verification of the storage of one or more images to a remote AE. DicomConnector can be configured to respond to these requests at appropriate times. A Storage Commitment Push Model report comprises an N-EVENT-REPORT which contains one or more successfully stored SOP instances and zero or more failed SOP instances. An association is initiated and the N-EVENT-REPORT is sent to a remote AE.

Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model – N-EVENT-REPORT	1.2.840.10008.1.20.1	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The table below describes the possible status codes that can be returned to the SCU device after the DICOM Integration Module AE has completed the requested N-ACTION:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Failed	C000	Unable to process	None
Error	C001 – CFFF	Internal errors – please contact Visbion support	None
Error	A700	Failed to connect to database	None
Success	0000	Sub-operation is complete	None

The following attributes are supported in Storage Commitment Push Model Step N-ACTION requests:

Description	Type	Tag
Storage Commitment Push Request Successful		
Transaction UID	1	(0008, 1195)
Retrieve AE Title	3	(0008, 0054)
Storage Media File-set ID	3	(0088, 0130)
Storage Media File-set UID	3	(0088, 0140)
Referenced SOP Sequence	1	(0008, 1199)
> Referenced SOP Class UID	1	(0008, 1150)
> Referenced SOP Instance UID	1	(0008, 1155)
> Retrieve AE Title	3	(0008, 0054)
> Storage Media File-set ID	3	(0088, 0130)
> Storage Media File-set UID	3	(0088, 0140)
Storage Commitment Push Request Complete – Failures Exist		
Transaction UID	1	(0008, 1195)
Retrieve AE Title	3	(0008, 0054)
Storage Media File-set ID	3	(0088, 0130)
Storage Media File-set UID	3	(0088, 0140)
Referenced SOP Sequence	1	(0008, 1199)
> Referenced SOP Class UID	1	(0008, 1150)
> Referenced SOP Instance UID	1	(0008, 1155)
> Retrieve AE Title	3	(0008, 0054)
> Storage Media File-set ID	3	(0088, 0130)
> Storage Media File-set UID	3	(0088, 0140)
Failed SOP Sequence	1	(0008, 1198)
> Referenced SOP Class UID	1	(0008, 1150)

Description	Type	Tag
> Referenced SOP Instance UID	1	(0008, 1155)
> Failure Reason	1	(0008, 1197)

The following attributes may be returned in a Storage Commitment Push Model Step N-EVENT-REPORT response:

Description	Type	Tag
Command Field	1	(0000, 0100)
Event Type ID	3	(0000, 1008)
Message ID being responded to	1	(0000, 0120)
Status	1	(0000, 0900)
Affected SOP Class UID	1	(0000, 0002)
Affected SOP Instance UID	1	(0000, 1000)

2.2.3 Association Acceptance Policies

The DicomConnector AE will only carry out operations following a request from a Remote AE.

A request from a remote AE for image storage will result in DicomConnector storing all images received during that association to the image database.

A request from a remote AE for verification will result in DicomConnector returning a C-ECHO response.

A request from a remote AE for a general purpose worklist will result in DicomConnector returning a general purpose worklist provided the AE and user is authorised accordingly.

A request from a remote AE for a modality worklist will result in DicomConnector returning a modality worklist provided the AE is authorised accordingly.

DicomConnector will also respond to queries received from remote AEs. Any remote AE can request and receive a list of images held on the database providing that the AE is authorised to do so. DicomConnector holds a configurable list of all authorised remote AEs.

2.2.3.1 Verification Request from Remote AE

The DicomConnector AE is permanently listening for associations and no operator action is required to initiate the handling of a verification request.

Associated Real-World Activity

Remote AEs can check that DicomConnector is running and providing service to clients by means of the verification service (C-ECHO). When DicomConnector receives a verification request it will respond with a status of 'success'.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The DicomConnector AE conforms to the standard for the DICOM Verification service class.

Presentation Context Acceptance Criterion

DicomConnector will accept any number of presentation contexts listed in the Accepted Presented Context Table.

Transfer Syntax Selection Policies

The DicomConnector AE will select the first presented transfer syntax that it supports.

2.2.3.2 Receive Image(s) from Remote AE

The DicomConnector AE continually listens for associations and no operator action is required to receive an image.

Important: The DICOM standard states that the Patient ID attribute (0010, 0020) is a type 2 attribute, which means it must exist, but can be blank. However, when receiving incoming C-STORE requests (receiving images to store), DicomConnector will only accept a valid value for the Patient ID attribute; that is, it must not be blank.

Associated Real-World Activity

The associated real-world activity for this service is to accept an image, then store and register it in the image database under the control of the PACS system.

Accepted Presentation Context Table

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	Note 1	Note 1	SCP	None
Digital X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.1	Note 1	Note 1	SCP	None
Digital X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.1.1	Note 1	Note 1	SCP	None

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Digital Mammography X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.2	Note 1	Note 1	SCP	None
Digital Mammography X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.2.1	Note 1	Note 1	SCP	None
Digital Intra-oral X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.3	Note 1	Note 1	SCP	None
Digital Intra-oral X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.3.1	Note 1	Note 1	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Note 1	Note 1	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Note 1	Note 1	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Note 1	Note 1	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Note 1	Note 1	SCP	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Note 1	Note 1	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Note 1	Note 1	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Note 1	Note 1	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Note 1	Note 1	SCP	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Note 1	Note 1	SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Note 1	Note 1	SCP	None
12-Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Note 1	Note 1	SCP	None

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Note 1	Note 1	SCP	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Note 1	Note 1	SCP	None
Haemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Note 1	Note 1	SCP	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Note 1	Note 1	SCP	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Note 1	Note 1	SCP	None
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Note 1	Note 1	SCP	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Note 1	Note 1	SCP	None
X-ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Note 1	Note 1	SCP	None
X-ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Note 1	Note 1	SCP	None
X-ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Note 1	Note 1	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Note 1	Note 1	SCP	None
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Note 1	Note 1	SCP	None
VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Note 1	Note 1	SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Note 1	Note 1	SCP	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Note 1	Note 1	SCP	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Note 1	Note 1	SCP	None

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Note 1	Note 1	SCP	None
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Note 1	Note 1	SCP	None
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Note 1	Note 1	SCP	None
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Note 1	Note 1	SCP	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Note 1	Note 1	SCP	None
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	Note 1	Note 1	SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Note 1	Note 1	SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Note 1	Note 1	SCP	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Note 1	Note 1	SCP	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Note 1	Note 1	SCP	None
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Note 1	Note 1	SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Note 1	Note 1	SCP	None
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Note 1	Note 1	SCP	None
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

If the transfer syntax is encapsulated one of the following will apply:

Name	UID
JPEG Baseline (Process 1): Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 and 4): Lossy JPEG 12 Bit Image Compression	1.2.840.10008.1.2.4.51
JPEG Extended (Process 3 and 5) (Retired)	1.2.840.10008.1.2.4.52
JPEG Spectral Selection, Non-Hierarchical (Process 6 and 8) (Retired)	1.2.840.10008.1.2.4.53
JPEG Spectral Selection, Non-Hierarchical (Process 7 and 9) (Retired)	1.2.840.10008.1.2.4.54
JPEG Full Progression, Non-Hierarchical (Process 10 and 12) (Retired)	1.2.840.10008.1.2.4.55
JPEG Full Progression, Non-Hierarchical (Process 11 and 13) (Retired)	1.2.840.10008.1.2.4.56
JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical (Process 15) (Retired)	1.2.840.10008.1.2.4.58
JPEG Extended, Hierarchical (Process 16 and 18) (Retired)	1.2.840.10008.1.2.4.59
JPEG Extended, Hierarchical (Process 17 and 19) (Retired)	1.2.840.10008.1.2.4.60
JPEG Spectral Selection, Hierarchical (Process 20 and 22) (Retired)	1.2.840.10008.1.2.4.61
JPEG Spectral Selection, Hierarchical (Process 21 and 23) (Retired)	1.2.840.10008.1.2.4.62
JPEG Full Progression, Hierarchical (Process 24 and 26) (Retired)	1.2.840.10008.1.2.4.63
JPEG Full Progression, Hierarchical (Process 25 and 27) (Retired)	1.2.840.10008.1.2.4.64
JPEG Lossless, Hierarchical (Process 28) (Retired)	1.2.840.10008.1.2.4.65
JPEG Lossless, Hierarchical (Process 29) (Retired)	1.2.840.10008.1.2.4.66
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70
RLE Lossless	1.2.840.10008.1.2.5

The DicomConnector AE conforms to the SOP's of the Storage service class at level 2, that is, full conformance. The table below shows the possible status codes that the DicomConnector AE may return to the SCU device after performing the storage request:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Error	A700 – A7NFF	Internal errors – please contact Visbion support	None
Error	C000 – CFFF	Internal errors – please contact Visbion support	None
Success	0000		None

When a successful C-STORE event occurs, the image has been successfully written to disk and inserted in the database.

Presentation Context Acceptance Criterion

The DicomConnector AE will accept any number of presentation contexts listed in the Accepted Presentation Context table. The AE will reject any requests received from remote AEs who are not listed in the local database of accepted AEs.

The DicomConnector AE drops groups 0001, 0003, 0005 and 0007 when storing objects in the database, as per Part 10 Section 7.1 of the DICOM 3.0 Standard.

Transfer Syntax Selection Policies

The DicomConnector AE will select the first presented transfer syntax that it supports.

2.2.3.3 Query Request from Remote AE

The DicomConnector AE continually listens for associations and no operator action is required to receive an image.

Associated Real-World Activity

The associated real-world activity is a user querying DicomConnector to obtain a list of patients/studies/series/images stored in the PACS system. When the DicomConnector receives a query (DIMSE C-FIND) it sends a single result record followed by a 'pending' response; this continues until the final record is sent after which a status of 'success' or other appropriate error code is sent.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model – C-FIND	1.2.840.10008.5.1.4.1.2.1.1	Note 1	Note 1	SCP	None
Study Root Query/Retrieve Information Model – C-FIND	1.2.840.10008.5.1.4.1.2.2.1	Note 1	Note 1	SCP	None
Patient/Study Only Query/Retrieve Information Model – C-FIND	1.2.840.10008.5.1.4.1.2.3.1	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

Each C-FIND SCP operation supports the use of relational queries.

The Patient Level keys for Patient Root and Patient/Study Only are:

Attribute Name	Attribute Tags	Request	Match	Response
Patient's Birth Date	(0010, 0030)	O	Y	Y
Patient's Birth Time	(0010, 0032)	O	N	Y
Patient's Sex	(0010, 0040)	O	Y	Y
Ethnic Group	(0010, 2160)	O	Y	Y
Number of Patient Related Studies	(0020, 1200)	O	N	Y
Number of Patient Related Series	(0020, 1202)	O	N	Y
Number of Patient Related Instances	(0020, 1204)	O	N	Y
Patient's Name	(0010, 0010)	O	Y	Y
Other Patient Names	(0010, 1001)	O	N	Y
Patient ID	(0010, 0020)	O	Y	Y
Other Patient IDs	(0010, 1000)	O	Y	Y

The Study Level keys for Patient Root and Patient/Study Only are:

Attribute Name	Attribute Tags	Request	Match	Response
Patient ID	(0010, 0020)	R	Y	N
Study Date	(0008, 0020)	O	Y	Y
Study Time	(0008, 0030)	O	N	Y
Accession Number	(0008, 0050)	O	Y	Y
Study ID	(0020, 0010)	O	Y	Y
Study Instance UID	(0020, 000D)	O	N	Y
Referring Physician's Name	(0008, 0090)	O	N	Y
Study Description	(0008, 1030)	O	N	Y
Patient's Age	(0010, 1010)	O	Y	Y
Patient's Size	(0010, 1020)	O	N	Y
Patient's Weight	(0010, 1030)	O	Y	Y
Occupation	(0010, 2180)	O	N	Y
Modalities in Study	(0008, 0061)	O	Y	Y
Number of Study Related Series	(0020, 1206)	O	N	Y
Number of Study Related Instances	(0020, 1208)	O	N	Y

The Patient Study keys for Study Root are:

Attribute Name	Attribute Tags	Request	Match	Response
Patient's Birth Date	(0010, 0030)	O	Y	Y
Patient's Birth Time	(0010, 0032)	O	N	Y
Patient's Sex	(0010, 0040)	O	Y	Y
Ethnic Group	(0010, 2160)	O	Y	Y
Number of Patient Related Studies	(0020, 1200)	O	N	Y
Number of Patient Related Series	(0020, 1202)	O	N	Y
Number of Patient Related Instances	(0020, 1204)	O	N	Y
Patient's Name	(0010, 0010)	O	Y	Y
Other Patient Names	(0010,1001)	O	N	Y
Patient ID	(0010, 0020)	O	Y	Y
Other Patient IDs	(0010, 1000)	O	Y	Y
Study Date	(0008, 0020)	O	Y	Y
Study Time	(0008, 0030)	O	N	Y
Accession Number	(0008, 0050)	O	Y	Y
Study ID	(0020, 0010)	O	Y	Y
Study Instance UID	(0020, 000D)	O	N	Y

Attribute Name	Attribute Tags	Request	Match	Response
Referring Physician's Name	(0008, 0090)	O	N	Y
Study Description	(0008, 1030)	O	N	Y
Patient's Age	(0010, 1010)	O	Y	Y
Patient's Size	(0010, 1020)	O	N	Y
Patient's Weight	(0010, 1030)	O	Y	Y
Occupation	(0010, 2180)	O	N	Y
Modalities in Study	(0008, 0061)	O	Y	Y
Number of Study Related Series	(0020, 1206)	O	N	Y
Number of Study Related Instances	(0020, 1208)	O	N	Y

The Series Level keys for Patient Root and Study Root are:

Attribute Name	Attribute Tags	Request	Match	Response
Study Instance UID	(0020, 000D)	R	Y	N
Number of Series Related Instances	(0020, 1209)	O	Y	Y
Modality	(0008, 0060)	O	Y	Y
Series Number	(0020, 0011)	O	Y	Y
Series Instance UID	(0020, 000E)	O	Y	Y

The Image Level keys for Patient Root and Study Root are:

Attribute Name	Attribute Tags	Request	Match	Response
Series Instance UID	(0020, 000E)	R	Y	N
Instance Number	(0020, 0013)	O	Y	Y
SOP Instance UID	(0008, 0018)	O	Y	Y
SOP Class UID	(0008, 0016)	O	Y	Y

Once the DicomConnector AE has performed the requested C-FIND operation, it may return a number of status codes to the requesting SCU device. The possible codes are given in the table below:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Success	0000	Matching is complete	None
Pending	FF00	Matches are continuing	None

Presentation Context Acceptance Criterion

The DicomConnector AE accepts any number of presentation contexts listed in the Accepted Presentation Context Table.

Transfer Syntax Selection Policies

The DicomConnector AE will select the first presented transfer syntax that it supports.

2.2.3.4 Retrieve Request from Remote AE

The DicomConnector AE continuously listens for associations and no operator action is required for it to respond to a retrieve request.

Associated Real-World Activity

The associated real-world activity is the user retrieving an image or set of images from DicomConnector, usually after performing a query (C-FIND). When a retrieve request (DIMSE C-MOVE) is received by DicomConnector it initiates a new association to the remote AE and sends the requested image(s) using the DIMSE C-STORE service.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.1.2	Note 1	Note 1	SCP	None
Study Root Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.2.2	Note 1	Note 1	SCP	None
Patient/Study Only Query/Retrieve Information Model – C-MOVE	1.2.840.10008.5.1.4.1.2.3.2	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The DicomConnector AE initiates a separate association for each image requested in the C-MOVE request.

The table below describes the possible status codes that can be returned to the SCU device after the DicomConnector AE has completed the requested C-MOVE:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Success	0000	Sub-operation is complete	None
Refused	A701	Out of Resources – Unable to calculate number of matches	None
	A702	Out of Resources – Unable to perform sub-operations	None
	A801	Move destination unknown	None
Failed	A900	Identifier does not match SOP Class	None
	C000	Unable to process	None
Error	C001 – CFFF	Internal errors – please contact Visbion support	None
Warning	B000	Sub-operations Complete – One or more failures or warnings	None
Cancel	FE00	Sub-operations terminated due to Cancel Indication	None
Pending	FF00	Sub-operations are continuing	None

Presentation Context Acceptance Criterion

The DicomConnector AE accepts any number of presentation contexts listed in the Accepted Presentation Context Table. The AE will reject any requests from remote AEs that are not known to it.

2.2.3.5 Retrieve Request from Remote AE

The DicomConnector AE continuously listens for associations and no operator action is required for it to respond to a retrieve request.

Associated Real-World Activity

The associated real-world activity is the user retrieving an image or set of images from DicomConnector, usually after performing a query (C-FIND). When a retrieve request (DIMSE C-GET) is received by DicomConnector it sends the requested image(s) using the DIMSE C-STORE service over the same association.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model – C-GET	1.2.840.10008.5.1.4.1.2.1.3	Note 1	Note 1	SCP	None
Study Root Query/Retrieve Information Model – C-GET	1.2.840.10008.5.1.4.1.2.2.3	Note 1	Note 1	SCP	None
Patient/Study Only Query/Retrieve Information Model – C-GET	1.2.840.10008.5.1.4.1.2.3.3	Note 1	Note 1	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Note 1	Note 1	SCU	Role Negotiation
Digital X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.1	Note 1	Note 1	SCU	Role Negotiation
Digital X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.1.1	Note 1	Note 1	SCU	Role Negotiation
Digital Mammography X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.2	Note 1	Note 1	SCU	Role Negotiation
Digital Mammography X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.2.1	Note 1	Note 1	SCU	Role Negotiation
Digital Intra-oral X-ray Image Storage for presentation	1.2.840.10008.5.1.4.1.1.1.3	Note 1	Note 1	SCU	Role Negotiation
Digital Intra-oral X-ray Image Storage for processing	1.2.840.10008.5.1.4.1.1.1.3.1	Note 1	Note 1	SCU	Role Negotiation
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Note 1	Note 1	SCU	Role Negotiation
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Note 1	Note 1	SCU	Role Negotiation

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Note 1	Note 1	SCU	Role Negotiation
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Note 1	Note 1	SCU	Role Negotiation
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Note 1	Note 1	SCU	Role Negotiation
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Note 1	Note 1	SCU	Role Negotiation
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Note 1	Note 1	SCU	Role Negotiation
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Note 1	Note 1	SCU	Role Negotiation
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Note 1	Note 1	SCU	Role Negotiation
12-Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Note 1	Note 1	SCU	Role Negotiation
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Note 1	Note 1	SCU	Role Negotiation
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Note 1	Note 1	SCU	Role Negotiation
Haemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Note 1	Note 1	SCU	Role Negotiation
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Note 1	Note 1	SCU	Role Negotiation
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Note 1	Note 1	SCU	Role Negotiation
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Note 1	Note 1	SCU	Role Negotiation
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Note 1	Note 1	SCU	Role Negotiation
X-ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Note 1	Note 1	SCU	Role Negotiation
X-ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Note 1	Note 1	SCU	Role Negotiation

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
X-ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Note 1	Note 1	SCU	Role Negotiation
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Note 1	Note 1	SCU	Role Negotiation
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Note 1	Note 1	SCU	Role Negotiation
VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Note 1	Note 1	SCU	Role Negotiation
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Note 1	Note 1	SCU	Role Negotiation
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Note 1	Note 1	SCU	Role Negotiation
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Note 1	Note 1	SCU	Role Negotiation
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Note 1	Note 1	SCU	Role Negotiation
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Note 1	Note 1	SCU	Role Negotiation
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Note 1	Note 1	SCU	Role Negotiation
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Note 1	Note 1	SCU	Role Negotiation
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Note 1	Note 1	SCU	Role Negotiation
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	Note 1	Note 1	SCU	Role Negotiation
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Note 1	Note 1	SCU	Role Negotiation
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Note 1	Note 1	SCU	Role Negotiation
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Note 1	Note 1	SCU	Role Negotiation

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Note 1	Note 1	SCU	Role Negotiation
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Note 1	Note 1	SCU	Role Negotiation
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Note 1	Note 1	SCU	Role Negotiation
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Note 1	Note 1	SCU	Role Negotiation
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Note 1	Note 1	SCU	Role Negotiation

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The DicomConnector AE initiates a separate association for each image requested in the C-GET request.

The table below describes the possible status codes that can be returned to the SCU device after the DicomConnector AE has completed the requested C-GET:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Success	0000	Sub-operation is complete	None
Refused	A701	Out of Resources – Unable to calculate number of matches	None
	A702	Out of Resources – Unable to perform sub-operations	None
	A801	Move destination unknown	None
Failed	A900	Identifier does not match SOP Class	None
	C000	Unable to process	None
Error	C001 – CFFF	Internal errors – please contact Visbion support	None

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Warning	B000	Sub-operations Complete – One or more failures or warnings	None
Cancel	FE00	Sub-operations terminated due to Cancel Indication	None
Pending	FF00	Sub-operations are continuing	None

Presentation Context Acceptance Criterion

The DicomConnector AE accepts any number of presentation contexts listed in the Accepted Presentation Context Table. The AE will reject any requests from remote AEs that are not known to it.

2.2.3.6 Request for General Purpose Worklist

The DicomConnector AE continually listens for associations and the SCU is required to submit their username and password before starting the request for the general purpose worklist. Note this is a proprietary extension.

Associated Real-World Activity

The associated real-world activity is a modality querying DicomConnector to obtain a list of general purpose worklist items from the PACS system. When DicomConnector receives a query (DIMSE C-FIND) it sends a single result record followed by a 'pending' response; this continues until the final record is sent after which a status of 'success' or other appropriate error code is sent.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
General Purpose Worklist Information Model – C-FIND	1.2.840.10008.5.1.4.32.1	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The table below describes the possible status codes that can be returned to the SCU device after the DicomConnector AE has completed the requested C-FIND:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Refused	A801	Move destination unknown	None
Failed	C000	Unable to process	None
Error	C001 – C006	Internal errors – please contact Visbion support	None
Error	C007	Incorrect username or password	None
Error	C008 – CFFF	Internal errors – please contact Visbion support	None
Cancel	FE00	Sub-operations terminated due to Cancel Indication	None
Success	0000	Sub-operation is complete	None
Pending	FF00	Sub-operations are continuing	None

General Purpose Worklist Conformance

In order for the DicomConnector AE to be able to provide General Purpose Worklist information, the Visbion database must receive appropriate worklist information via the HL7 and DICOM links to the department scheduling system and modalities.

The DicomConnector AE does not provide scheduling services. It only acts as a translation service to receive scheduling information via HL7 and support queries for that information via DICOM.

The general purpose worklist service supports the following matching keys:

Description	Type	Tag
General Purpose Scheduled Procedure Step Status	Required	(0040, 4001)
Scheduled Workitem Code Sequence	Required	(0040, 4018)
> Code Value	Required	(0008, 0100)
> Coding Scheme Designator	Required	(0008, 0102)
Scheduled Procedure Step Start Date and Time	Required	(0040, 4005)
Expected Completion Date and Time	Required	(0040, 4011)
Patient's Name	Required	(0010, 0010)
Patient ID	Required	(0010, 0020)
Patient's Birth Date	Optional	(0010, 0030)
Other Patient IDs	Optional	(0010, 1000)
Patient's Sex	Optional	(0010, 0040)

The general purpose worklist service supports the following return keys.

Description	Type	Condition	Tag
SOP Class UID	1		(0008, 0016)
SOP Instance UID	1		(0008, 0018)
Retrieve AE Title	2		(0008, 0054)
General Purpose Scheduled Procedure Step Status	1		(0040, 4001)
Input Availability Flag	1		(0040, 4020)
General Purpose Scheduled Procedure Step Priority	1		(0040, 4003)
Scheduled Procedure Step ID	1		(0040, 0009)
Scheduled Workitem Code Sequence	1		(0040, 4018)
> Code Value	1	Scheduled Workitem Code Sequence (0040, 4018)	(0008, 0100)
> Coding Scheme Designator	1	Scheduled Workitem Code Sequence (0040, 4018)	(0008, 0102)
> Code Meaning	1	Scheduled Workitem Code Sequence (0040, 4018)	(0008, 0104)
Scheduled Processing Applications Code Sequence	2		(0040, 4004)
Scheduled Station Name Code Sequence	2		(0040, 4025)
Scheduled Station Class Code Sequence	2		(0040, 4026)
Scheduled Station Geographic Location Code Sequence	2		(0040, 4027)
Scheduled Procedure Step Start Date and Time	1		(0040, 4005)
Expected Completion Date and Time	2		(0040, 4011)

Description	Type	Condition	Tag
Scheduled Human Performers Sequence	2		(0040, 4034)
Referenced Performed Procedure Step Sequence	2		(0008, 1111)
Input Information Sequence	2		(0040, 4021)
> Study Instance UID	1	Input Information Sequence (0040, 4021)	(0020, 000D)
Relevant Information Sequence	2		(0040, 4022)
Resulting General Purpose Performed Procedure Steps Sequence	2		(0040, 4015)
Actual Human Performers Sequence	2		(0040, 4035)
Multiple Copies Flag	1		(0040, 4006)
Referenced Request Sequence	1		(0040, A370)
> Study Instance UID	1	Referenced Request Sequence (0040, A370)	(0020, 000D)
> Requested Procedure ID	1	Referenced Request Sequence (0040, A370)	(0040, 1001)
> Requested Procedure Description	1C	Referenced Request Sequence (0040, A370)	(0032, 1060)
Patient's Name	1		(0010, 0010)
Patient ID	1		(0010, 0020)
Patient's Birth Date	2		(0010, 0030)
Other Patient IDs	2		(0010, 1000)
Patient's Sex	2		(0010, 0040)

Presentation Context Acceptance Criterion

The DicomConnector AE will accept any number of presentation contexts listed in the Accepted Presentation Context table.

Transfer Syntax Selection Policies

The DicomConnector AE will select the first presented transfer syntax that it supports.

2.2.3.7 Request for Modality Worklist

The DICOM Integration Module AE continually listens for associations.

Associated Real-World Activity

The associated real-world activity is a user querying DicomConnector to obtain a list of modality worklist items from the PACS system. When DicomConnector receives a query (DIMSE C-FIND) it sends a single result record followed by a 'pending' response; this continues until the final record is sent after which a status of 'success' or other appropriate error code is sent.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model – C-FIND	1.2.840.10008.5.1.4.31	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The table below describes the possible status codes that can be returned to the SCU device after the DICOM Integration Module AE has completed the requested C-FIND:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Failed	C000	Unable to process	None
Error	C001 – C007	Internal errors – please contact Visbion support	None
Error	C008	Scheduled Station AE unknown	None
Error	C009 – CFFF	Internal errors – please contact Visbion support	None
Success	0000	Sub-operation is complete	None

The table below shows the supported search keys:

Description	Type	Tag
Scheduled Station AE Title	Required	(0040, 0001)
Scheduled Procedure Step Start Date	Required	(0040, 0002)
Scheduled Procedure Step Start Time	Required	(0040, 0003)
Scheduled Procedure Step ID	Optional	(0040, 0009)

The following return keys are supported:

Description	Type	Condition	Tag
Scheduled Station AE Title	1		(0040, 0001)
Scheduled Procedure Step Start Date	1		(0040, 0002)
Scheduled Procedure Step Start Time	1		(0040, 0003)
Scheduled Procedure Step Description	1C	Either the Scheduled Procedure Description (0040, 0007) or the Scheduled Protocol Code Sequence (0040, 0008), or both, shall be supported by the SCP	(0040, 0007)
Scheduled Procedure Protocol Code Sequence	1C	Either the Scheduled Procedure Description (0040, 0007) or the Scheduled Protocol Code Sequence (0040, 0008), or both, shall be supported by the SCP	(0040, 0008)
Scheduled Procedure Step ID	1		(0040, 0009)
Scheduled Procedure Step Status	3		(0040, 0020)
Requested Procedure ID	1		(0040, 1001)
Requested Procedure Description	1C	Either the Requested Procedure Description (0032, 1060) or the Requested Procedure Code Sequence (0032, 1064), or both, shall be supported by the SCP	(0032, 1060)
Requested Procedure Code Sequence	1C	Either the Requested Procedure Description (0032, 1060) or the Requested Procedure Code Sequence (0032, 1064), or both, shall be supported by the SCP	(0032, 1064)
Patient ID	1		(0010, 0020)
Patient's Name	1		(0010, 0010)
Patient's Birth Date	2		(0010, 0030)
Patient's Sex	2		(0010, 0040)

Description	Type	Condition	Tag
Modality	1		(0008, 0060)
Accession Number	2		(0008, 0050)

2.2.3.8 Request for Modality Performed Procedure Step N-CREATE

The DICOM Integration Module AE continually listens for associations.

Associated Real-World Activity

Modalities can query DicomConnector for a worklist, and subsequently complete each item in their worklist. This action starts a worklist item by setting its status to 'In Progress'; the modality will later indicate its completion by sending an appropriate N-SET DIMSE request.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Performed Procedure Step – N-CREATE	1.2.840.10008.3.1.2.3.3	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The table below describes the possible status codes that can be returned to the SCU device after the DICOM Integration Module AE has completed the requested N-CREATE:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Failed	C000	Unable to process	None
Error	C001 – CFFF	Internal errors – please contact Visbion support	None
Error	A700	Failed to connect to database	None
Error	A710	Performed Procedure Step Object may no longer be updated	None
Error	0106	Invalid attribute value	None
Success	0000	Sub-operation is complete	None

An N-CREATE request for Modality Performed Procedure Step with a Performed Procedure Step Status not equal to IN PROGRESS will always result in an error response of code 0106.

The following attributes are supported in Modality Performed Procedure Step N-CREATE requests:

Description	Type	Condition	Tag
Performed Procedure Step ID	1		(0040, 0253)
Performed Procedure Step Description	2		(0040, 0254)
Performed Procedure Step Start Date	1		(0040, 0244)
Performed Procedure Step Start Time	1		(0040, 0245)
Performed Station AE Title	1		(0040, 0241)
Performed Procedure Step Status	1		(0040, 0252)
Scheduled Procedure Step ID	2		(0040, 0009)
Scheduled Procedure Step Description	2		(0040, 0007)
Study Instance UID	1		(0020, 000D)
Accession Number	2		(0008, 0050)
Patient ID	2		(0010, 0020)
Patient's Name	2		(0010, 0010)
Patient's Birth Date	2		(0010, 0030)
Patient's Sex	2		(0010, 0040)
Modality	1		(0008, 0060)
Performed Series Sequence	1		(0040, 0340)
> Retrieve AE Title	2C	Performed Series Sequence (0040, 0340)	(0008, 0054)
> Series Instance UID	1C	Performed Series Sequence (0040, 0340)	(0020, 000E)
> Protocol Name	1C	Performed Series Sequence (0040, 0340)	(0018, 1030)

The following attributes may be returned in a Modality Performed Procedure Step N-CREATE response:

Description	Type	Tag
Performed Procedure Step ID	1	(0040, 0253)
Performed Procedure Step Description	2	(0040, 0254)
Performed Procedure Step Start Date	1	(0040, 0244)
Performed Procedure Step Start Time	1	(0040, 0245)
Performed Station AE Title	1	(0040, 0241)
Performed Procedure Step Status	1	(0040, 0252)
Scheduled Procedure Step ID	2	(0040, 0009)
Scheduled Procedure Step Description	2	(0040, 0007)
Study Instance UID	1	(0020, 000D)
Accession Number	2	(0008, 0050)
Patient ID	2	(0010, 0020)
Patient's Name	2	(0010, 0010)
Patient's Birth Date	2	(0010, 0030)
Patient's Sex	2	(0010, 0040)
Modality	1	(0008, 0060)
Retrieve AE Title	2	(0008, 0054)
Series Instance UID	1	(0020, 000E)
Protocol Name	1	(0018, 1030)

2.2.3.9 Request for Modality Performed Procedure Step N-SET

The DICOM Integration Module AE continually listens for associations.

Associated Real-World Activity

Modalities can query DicomConnector for a worklist, and subsequently complete each item in their worklist. This action completes a worklist item whose status is 'In Progress' by setting its status to either 'Completed' or an appropriate error status.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Performed Procedure Step – N-SET	1.2.840.10008.3.1.2.3.3	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The table below describes the possible status codes that can be returned to the SCU device after the DICOM Integration Module AE has completed the requested N-SET:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Failed	C000	Unable to process	None
Error	C001 – CFFF	Internal errors – please contact Visbion support	None
Error	A700	Failed to connect to database	None
Error	A701	Administrator not found	None
Error	A710	The Performed Procedure Step Object may no longer be updated	None
Error	0106	Invalid attribute value	None
Success	0000	Sub-operation is complete	None

An N-SET request to change the Performed Procedure Step Status of a Modality Performed Procedure Step to a value not equal to COMPLETED or DISCONTINUED, will always result in an error response of code 0106.

The following attributes are supported in Modality Performed Procedure Step N-SET requests:

Description	Type	Condition	Tag
Performed Procedure Step Status	3		(0040, 0252)
Performed Procedure Step End Date	3		(0040, 0250)
Performed Procedure Step End Time	3		(0040, 0251)
Performed Series Sequence	1		(0040, 0340)
> Series Instance UID	1C	Performed Series Sequence (0040, 0340)	(0020, 000E)
> Retrieve AE Title	2C	Performed Series Sequence (0040, 0340)	(0008, 0054)
> Protocol Name	1C	Performed Series Sequence (0040, 0340)	(0018, 1030)

Description	Type	Condition	Tag
> Referenced Image Sequence	1		(0008, 1140)
>> Referenced SOP Class UID	1C	Referenced Image Sequence (0008, 1140)	(0008, 1150)
>> Referenced SOP Instance UID	1C	Referenced Image Sequence (0008, 1140)	(0008, 1155)

The following attributes may be returned in a Modality Performed Procedure Step N-SET response:

Description	Type	Tag
Performed Procedure Step Status	1	(0040, 0252)
Performed Procedure Step End Date	1	(0040, 0250)
Performed Procedure Step End Time	1	(0040, 0251)
Series Instance UID	1	(0020, 000E)
Retrieve AE Title	2	(0008, 0054)
Referenced SOP Class UID	1	(0008, 1150)
Referenced SOP Instance UID	1	(0008, 1155)
Protocol Name	1	(0018, 1030)

2.2.3.10 Request for Storage Commitment Push Model N-ACTION

The DICOM Integration Module AE continually listens for associations.

Associated Real-World Activity

Storage Commitment Push Model requests correspond to the verification of the storage of one or more images to an AE. When DicomConnector receives a Storage Commitment Push Model request (DIMSE N-ACTION) it will query the PACS system to check the receipt status of each of the images requested and queue a suitable response to be sent back over a different association; it will then respond to the original request (over the same association it was received on) with an appropriate status code.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model – N-ACTION	1.2.840.10008.1.20.1	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The table below describes the possible status codes that can be returned to the SCU device after the DICOM Integration Module AE has completed the requested N-ACTION:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Failed	C000	Unable to process	None
Error	C001 – CFFF	Internal errors – please contact Visbion support	None
Error	A700	Failed to connect to database	None
Error	0110	Processing Failure	None
Error	0118	No Such SOP Class	None
Success	0000	Sub-operation is complete	None

The following attributes are supported in Storage Commitment Push Model Step N-ACTION requests:

Description	Type	Tag
Transaction UID	1	(0008, 1195)
Storage Media File-set ID	3	(0088, 0130)
Storage Media File-set UID	3	(0088, 0140)
Referenced SOP Sequence	1	(0008, 1199)
> Referenced SOP Class UID	1	(0008, 1150)
> Referenced SOP Instance UID	1	(0008, 1155)
> Storage Media File-set ID	3	(0088, 0130)
> Storage Media File-set UID	3	(0088, 0140)

The following attributes may be returned in a Storage Commitment Push Model Step N-ACTION response:

Description	Type	Tag
Command Field	1	(0000, 0100)
Action Type ID	1	(0000, 1008)
Message ID being responded to	1	(0000, 0120)
Status	1	(0000, 0900)
Affected SOP Class UID	1	(0000, 0002)
Affected SOP Instance UID	1	(0000, 1000)

2.2.3.11 Request for Storage Commitment Push Model Report N-EVENT-REPORT

The DICOM Integration Module AE continually listens for associations.

Associated Real-World Activity

Storage Commitment Push Model requests correspond to the verification of the storage of one or more images to an AE. When DicomConnector receives a Storage Commitment Push Model report (DIMSE N-EVENT-REPORT) it will notify the PACS system that the images have been safely stored to the remote AE.

Accepted Presentation Context Table

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model – N-EVENT-REPORT	1.2.840.10008.1.20.1	Note 1	Note 1	SCP	None

Note 1 – The following transfer syntax options are configurable:

Name	UID
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
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90

The table below describes the possible status codes that can be returned to the SCU device after the DICOM Integration Module AE has completed the requested N-ACTION:

Service Status	Status Codes	Further Meaning	Related Fields sent back to the SCU
Failed	C000	Unable to process	None
Error	C001 – CFFF	Internal errors – please contact Visbion support	None
Error	A700	Failed to connect to database	None
Success	0000	Sub-operation is complete	None

The following attributes are supported in Storage Commitment Push Model Step N-ACTION requests:

Description	Type	Tag
Storage Commitment Push Request Successful		
Transaction UID	1	(0008, 1195)
Retrieve AE Title	3	(0008, 0054)
Storage Media File-set ID	3	(0088, 0130)
Storage Media File-set UID	3	(0088, 0140)
Referenced SOP Sequence	1	(0008, 1199)
> Referenced SOP Class UID	1	(0008, 1150)
> Referenced SOP Instance UID	1	(0008, 1155)
> Retrieve AE Title	3	(0008, 0054)
> Storage Media File-set ID	3	(0088, 0130)
> Storage Media File-set UID	3	(0088, 0140)
Storage Commitment Push Request Complete – Failures Exist		
Transaction UID	1	(0008, 1195)
Retrieve AE Title	3	(0008, 0054)
Storage Media File-set ID	3	(0088, 0130)
Storage Media File-set UID	3	(0088, 0140)
Referenced SOP Sequence	1	(0008, 1199)
> Referenced SOP Class UID	1	(0008, 1150)
> Referenced SOP Instance UID	1	(0008, 1155)
> Retrieve AE Title	3	(0008, 0054)
> Storage Media File-set ID	3	(0088, 0130)
> Storage Media File-set UID	3	(0088, 0140)
Failed SOP Sequence	1	(0008, 1198)
> Referenced SOP Class UID	1	(0008, 1150)

Description	Type	Tag
> Referenced SOP Instance UID	1	(0008, 1155)
> Failure Reason	1	(0008, 1197)

The following attributes may be returned in a Storage Commitment Push Model Step N-EVENT-REPORT response:

Description	Type	Tag
Command Field	1	(0000, 0100)
Event Type ID	1	(0000, 1008)
Message ID being responded to	1	(0000, 0120)
Status	1	(0000, 0900)
Affected SOP Class UID	1	(0000, 0002)
Affected SOP Instance UID	1	(0000, 1000)

2.3 Communication Profiles

2.3.1 Supported Communication Stacks

2.3.1.1 Open Systems Interconnection (OSI) Stack

The OSI Stack is not supported.

2.3.1.2 Transmission Control Protocol/Internet Protocol (TCP/IP) Stack

The TCP/IP stack is inherited from Microsoft® Windows® 2000.

2.3.1.3 Physical Media Support

Ethernet v2.0, Institute of Electrical and Electronics Engineers (IEEE) 802.3.

2.3.1.4 Point-to-Point Stack

The 50-pin American College of Radiology-National Electrical Manufacturers Association (ACR-NEMA) connection is not supported by this product.

2.4 Extensions / Specialisations / Privatisations

General Purpose Worklist adheres as closely as possible to the standard but username and password support is proprietary.

2.5 Configuration

2.5.1 Configurable Parameters

At the operating system level, the Internet Protocol (IP) address, netmask, default gateway and Domain Name System (DNS) servers can all be configured by a Visbion Field Engineer.

A Visbion Field Engineer can also change the port number of Visbion DicomConnector from its default setting of 104.

Similarly, an engineer can also change the number of simultaneous associations the Visbion DICOM Integration Module will accept. The default setting for this parameter is 16.

The AE Title parameter for Visbion DicomConnector can also be changed by a Visbion Field Engineer.

Prior to system installation, Visbion engineers will require the port number, IP address, AE title and a text description for each device/modality that is to be allowed to connect to Visbion DicomConnector. The text description field is used to enable users to identify the various devices.

2.6 Support of Extended Character Sets

This Application Entity does not support Extended Character Sets.

3. Contacting Visbion

3.1 Visbion Solutions

Visbion delivers diagnostic imaging solutions to meet the demanding needs of clinicians. Our emphasis is on providing better patient care by maximising the efficiency and accuracy with which clinicians work. To do this we rely on extensive clinical feedback as we develop and deliver our products to institutions around the world.

Our product suite consists of solutions and applications developed to meet the requirements of individuals and large imaging departments alike. Visbion's manufacturer-independent, standards-based, enterprise-wide solutions, IPACS, OPACS and VPACS, are delivered and supported by dedicated and comprehensive professional services.

To learn more about the Visbion range of solutions, visit our website at:

www.visbion.com

3.2 Technical Support

If you have a technical question that cannot be answered by this guide, the online help or the system administrator, please visit the support area on our website to access customer support:

www.visbion.com/support

3.3 Visbion Headquarters

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