



KODAK VERSATILE INTELLIGENT PATIENT ARCHIVE
VERSION 5.4.4

DICOM Conformance Statement

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1. INTRODUCTION

1.1. Scope and Field of Application

This document is the DICOM Conformance Statement for VIParchive 5.4. The purpose of this document is to describe how VIParchive collaborates in a DICOM network with other DICOM Systems.

 **Note** – VIParchive is implemented on top of MERGE Technologies Corporation MergeCOM-3 Advanced Integrator's Tool Kit.

1.2. References

[DICOM-3]	Digital Imaging and Communications in Medicine (DICOM), parts 1 through 14 (NEMA PS 3.1-14)
MERGE-3	MergeCOM-3 Advanced Toolkit of Merge Technologies Inc.

1.3. Definitions

See [DICOM-3].

1.4. Symbols and Abbreviations

Symbols and abbreviations related to DICOM (see [DICOM-3]):

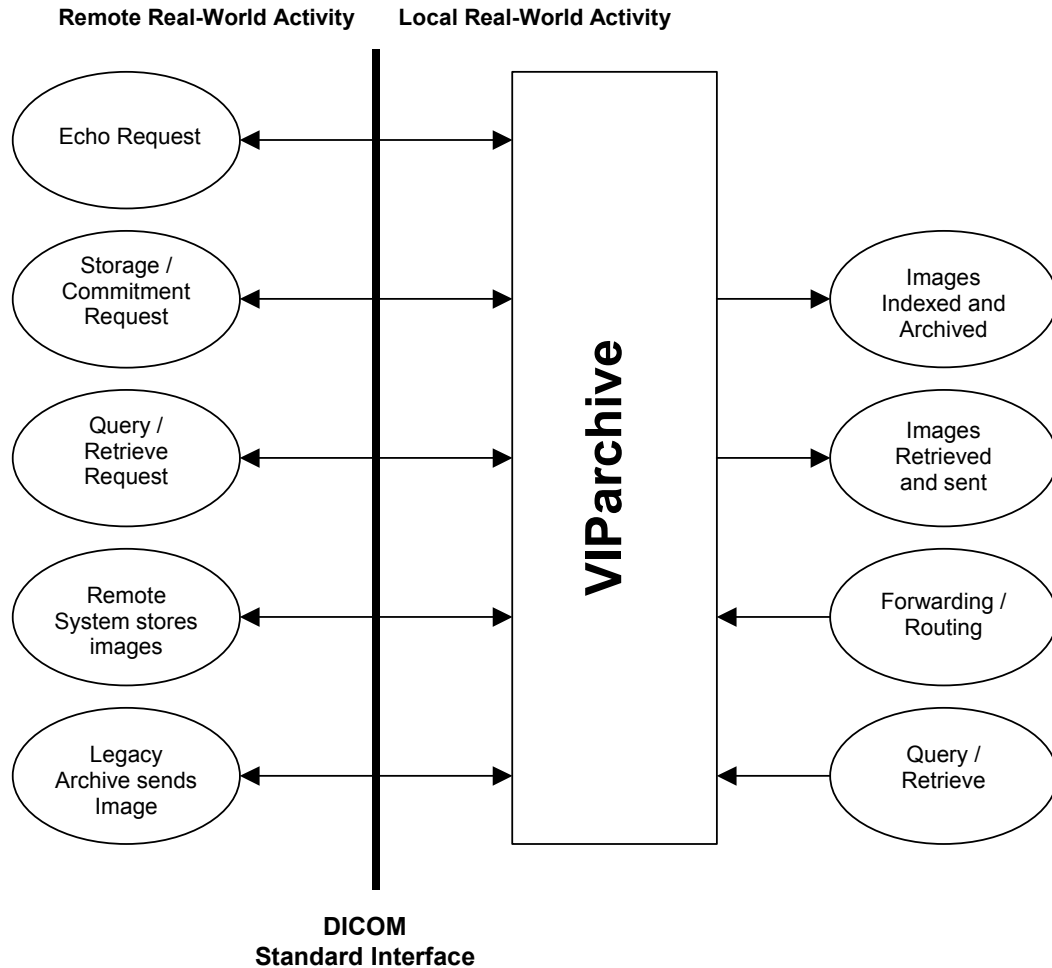
SCP	Storage Class Provider
SCU	Storage Class User
AE	Application Entity
SOP	Service-Object Pair
PDU	Protocol Data Units
DUL	DICOM Upper Layer
DIMSE	DICOM Message Service Element
IOD	Information Object Definition
UID	Unique Identifier
VR	Value Representation
VM	Value Multiplicity

2. IMPLEMENTATION MODEL

VIParchive services are implemented as a set of separate processes sharing the same Application Entity Title.

2.1. Application Data Flow Diagram

Figure 1 - VIParchive DICOM Data Flow Diagram



The Remote Storage SCU opens an association with VIParchive and sends C-STORE requests. The Remote SCU may also send a N-ACTION request for asking Storage Commitment. VIParchive sends N-EVENT to report the storage completion through another association.

The Query/Retrieve SCU queries VIParchive and sends C-MOVE requests.

VIParchive sends images (Forwarding tasks or routing rules) as a Storage SCU to a Remote DICOM System acting as a Storage SCP.

VIParchive sends Query/Retrieve requests (Query and Migration tasks) as a Query/Retrieve SCU to a Remote DICOM System acting as a Query/Retrieve SCP.

2.2. Functional Definition of Application Entities

VIParchive acts as an SCP for the Verification, Storage, Storage Commitment and Query/Retrieve SOP Classes.

VIParchive acts as an SCU for the Storage and Query/Retrieve SOP Classes.

2.3. Sequencing of Real-World Activities

Not applicable.

3. AE SPECIFICATIONS

3.1. VIParchive DICOM services AE Specifications

VIParchive provides Standard Conformance to the following SOP Classes as both a Storage SCU and SCP:

Tableau 1 - Storage SOP Classes as SCU and SCP

SOP Class UID	SOP Class Name
1.2.840.10008.5.1.1.27	Stored Print Storage
1.2.840.10008.5.1.1.29	Hardcopy Grayscale Image Storage
1.2.840.10008.5.1.1.30	Hardcopy Color Image Storage
1.2.840.10008.5.1.4.1.1.1	Computed Radiography Image Storage
1.2.840.10008.5.1.4.1.1.1.1	Digital X-Ray Image Storage - For Presentation
1.2.840.10008.5.1.4.1.1.1.1.1	Digital X-Ray Image Storage - For Processing
1.2.840.10008.5.1.4.1.1.1.2	Digital Mammography X-Ray Image Storage - For Presentation
1.2.840.10008.5.1.4.1.1.1.2.1	Digital Mammography X-Ray Image Storage - For Processing
1.2.840.10008.5.1.4.1.1.1.3	Digital Intra-oral X-Ray Image Storage - For Presentation
1.2.840.10008.5.1.4.1.1.1.3.1	Digital Intra-oral X-Ray Image Storage - For Processing
1.2.840.10008.5.1.4.1.1.2	CT Image Storage
1.2.840.10008.5.1.4.1.1.2.1	Enhanced CT Image Storage
1.2.840.10008.5.1.4.1.1.3	Ultrasound Multi-frame Image Storage (retired)
1.2.840.10008.5.1.4.1.1.3.1	Ultrasound Multi-frame Image Storage
1.2.840.10008.5.1.4.1.1.4	MR Image Storage
1.2.840.10008.5.1.4.1.1.4.1	Enhance MR Image Storage
1.2.840.10008.5.1.4.1.1.4.2	MR Spectroscopy Storage
1.2.840.10008.5.1.4.1.1.5	Nuclear Medicine Image Storage (Retired)
1.2.840.10008.5.1.4.1.1.6	Ultrasound Image Storage (retired)
1.2.840.10008.5.1.4.1.1.6.1	Ultrasound Image Storage
1.2.840.10008.5.1.4.1.1.7	Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.7.1	Multi-frame Single Bit Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.7.2	Multi-frame Grayscale Byte Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.7.3	Multi-frame Grayscale Word Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.7.4	Multi-frame True Color Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.8	Standalone Overlay Storage
1.2.840.10008.5.1.4.1.1.9	Standalone Curve Storage
1.2.840.10008.5.1.4.1.1.9.1.1	12-lead ECG Waveform Storage
1.2.840.10008.5.1.4.1.1.9.1.2	General ECG Waveform Storage
1.2.840.10008.5.1.4.1.1.9.1.3	Ambulatory ECG Waveform Storage
1.2.840.10008.5.1.4.1.1.9.2.1	Hemodynamic Waveform Storage
1.2.840.10008.5.1.4.1.1.9.3.1	Cardiac Electrophysiology Waveform Storage
1.2.840.10008.5.1.4.1.1.9.4.1	Basic Voice Audio Waveform Storage
1.2.840.10008.5.1.4.1.1.10	Standalone Modality LUT Storage
1.2.840.10008.5.1.4.1.1.11	Standalone VOI LUT Storage
1.2.840.10008.5.1.4.1.1.11.1	Grayscale Softcopy Presentation State Storage
1.2.840.10008.5.1.4.1.1.12.1	X-Ray Angiographic Image Storage
1.2.840.10008.5.1.4.1.1.12.2	X-Ray Radiofluoroscopic Image Storage
1.2.840.10008.5.1.4.1.1.12.3	X-Ray Angiographic Bi-Plane Image Storage
1.2.840.10008.5.1.4.1.1.20	Nuclear Medicine Image Storage
1.2.840.10008.5.1.4.1.1.66	Raw Data Storage
1.2.840.10008.5.1.4.1.1.66.1	Spatial Registration Storage
1.2.840.10008.5.1.4.1.1.66.2	Spatial Fiducials Storage
1.2.840.10008.5.1.4.1.1.77.1.1	VL Endoscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.1.1	Video Endoscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.2	VL Microscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.2.1	Video Microscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.3	VL Slide-Coordinates Microscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.4	VL Photographic Image Storage

1.2.840.10008.5.1.4.1.1.77.1.4.1	Video Photographic Image Storage
1.2.840.10008.5.1.4.1.1.88.11	Basic Text Structured Reporting Storage
1.2.840.10008.5.1.4.1.1.88.22	Enhanced Structured Reporting Storage
1.2.840.10008.5.1.4.1.1.88.33	Comprehensive Structured Reporting Storage
1.2.840.10008.5.1.4.1.1.88.40	Procedure Log Storage
1.2.840.10008.5.1.4.1.1.88.50	Mammography CAD SR
1.2.840.10008.5.1.4.1.1.88.59	Key Object Selection Document
1.2.840.10008.5.1.4.1.1.88.65	Chest CAD SR Storage
1.2.840.10008.5.1.4.1.1.128	Positron Emission Tomography Image Storage
1.2.840.10008.5.1.4.1.1.129	Positron Emission Tomography Curve Storage
1.2.840.10008.5.1.4.1.1.481.1	RT Image Storage
1.2.840.10008.5.1.4.1.1.481.2	RT Dose Storage
1.2.840.10008.5.1.4.1.1.481.3	RT Structure Set Storage
1.2.840.10008.5.1.4.1.1.481.4	RT Beams Treatment Record Storage
1.2.840.10008.5.1.4.1.1.481.5	RT Plan Storage
1.2.840.10008.5.1.4.1.1.481.6	RT Brachy Treatment Record Storage
1.2.840.10008.5.1.4.1.1.481.7	RT Treatment Summary Record Storage

VIParchive provides Standard Conformance to the Verification and Storage Commitment Push Model SOP Classes as a SCP:


Tableau 2 - Verification and Storage Commitment SOP Classes as SCP

SOP Class UID	SOP Class Name
1.2.840.10008.1.1	Verification SOP Class
1.2.840.10008.1.20.1	Storage Commitment Push Model

VIParchive provides Standard Conformance to the following SOP Classes as both SCU and SCP.

Tableau 3 - Query/Retrieve SOP Classes as SCU and SCP

SOP Class UID	SOP Class Name
1.2.840.10008.5.1.4.1.2.1.1	Patient Root Query / Retrieve Information Model – FIND
1.2.840.10008.5.1.4.1.2.1.2	Patient Root Query / Retrieve Information Model – MOVE
1.2.840.10008.5.1.4.1.2.2.1	Study Root Query / Retrieve Information Model – FIND
1.2.840.10008.5.1.4.1.2.2.2	Study Root Query / Retrieve Information Model – MOVE
1.2.840.10008.5.1.4.1.2.3.1	Patient / Study Only Root Query / Retrieve Information Model – FIND
1.2.840.10008.5.1.4.1.2.3.2	Patient / Study Only Root Query / Retrieve Information Model – MOVE

 **Note** – These SOP Classes are supported by default. By altering the configuration, it is possible to support fewer, more or non-standard SOP Classes.

3.1.1. Association Establishment Policies

3.1.1.1. General

VIParchive accepts association from remote DICOM Systems to provide Storage, Storage Commitment, and Query/Retrieve Services.

VIParchive initiates new associations:

- To send a N-EVENT-REPORT (Storage Commitment)
- To send images to Remote DICOM destinations (Forwarding Task, Routing Rules)

- To query a Remote DICOM System (Query Task)
- To migrate studies from a DICOM System source to a DICOM System destination (Migration Task)

The maximum PDU size is configurable, and by default is 56 Kbytes.

3.1.1.2. Number of Associations

As an SCP, VIParchive allows multiple simultaneous associations for association acceptance.

A configuration parameter specifies the maximum number of parallel association VIParchive can handle. This number is actually limited only by physical resources.

3.1.1.3. Asynchronous Nature

VIParchive does not support asynchronous communication (multiple outstanding transactions over a single association).

3.1.1.4. Implementation Identifying Information

Implementation Class UID	2.16.840.1
Implementation Version Name	MergeCOM3_340

3.1.2. Association Initiation Policy

VIParchive initiates associations for the following activities:

- Sending images (Forwarding Task, Routing Rules)
- Querying a Remote DICOM System (Query Task)
- Retrieving Images from a Remote DICOM System (Migration Task)

In addition, VIParchive sends N-EVENT-REPORT for answering to Storage Commitment requests.

3.1.2.1. Real-World Activity – Sending Images

3.1.2.1.1. Associated Real-World Activity

VIParchive offers two functions to send images to remote DICOM Systems:

- Forwarding Tasks: set of Studies to be sent to a specific Remote DICOM System. The granularity is the Study, i.e. all the images that are part of the Study have to be sent.
- Routing Rules applied on incoming images. Although granularity is the image, VIParchive tries to send as much as possible images from the same Study in a single association.

3.1.2.1.2. Proposed Presentation Contexts

Tableau 4 - Proposed Contexts to Send Images to a Remote DICOM System

Presentation contexts Table				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Stored Print Storage	1.2.840.10008.5.1.1.27	See below	SCU	None
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	See below	SCU	None
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	See below	SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	See below	SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	See below	SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	See below	SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	See below	SCU	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	See below	SCU	None
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	See below	SCU	None
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	See below	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	See below	SCU	None
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	See below	SCU	None
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	See below	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	See below	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	See below	SCU	None
Enhance MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	See below	SCU	None
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	See below	SCU	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	See below	SCU	None
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	See below	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	See below	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	See below	SCU	None
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	See below	SCU	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	See below	SCU	None
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	See below	SCU	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	See below	SCU	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	See below	SCU	None

Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	See below	SCU	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	See below	SCU	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	See below	SCU	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	See below	SCU	None
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	See below	SCU	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	See below	SCU	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	See below	SCU	None
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	See below	SCU	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	See below	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	See below	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	See below	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	See below	SCU	None
X-Ray Angiographic Bi-Plane Image Storage	1.2.840.10008.5.1.4.1.1.12.3	See below	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	See below	SCU	None
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	See below	SCU	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	See below	SCU	None
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	See below	SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	See below	SCU	None
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	See below	SCU	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	See below	SCU	None
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	See below	SCU	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	See below	SCU	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	See below	SCU	None
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	See below	SCU	None
Basic Text Structured Reporting Storage	1.2.840.10008.5.1.4.1.1.88.11	See below	SCU	None
Enhanced Structured Reporting Storage	1.2.840.10008.5.1.4.1.1.88.22	See below	SCU	None
Comprehensive Structured Reporting Storage	1.2.840.10008.5.1.4.1.1.88.33	See below	SCU	None
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	See below	SCU	None
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	See below	SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	See below	SCU	None
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	See below	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	See below	SCU	None
Positron Emission Tomography Curve Storage	1.2.840.10008.5.1.4.1.1.129	See below	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	See below	SCU	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	See below	SCU	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	See below	SCU	None
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	See below	SCU	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	See below	SCU	None

RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	See below	SCU	None
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	See below	SCU	None

VIParchive supports the following Transfer Syntaxes:

Tableau 5 - Transfer Syntaxes for Sending Images

Transfer Syntaxes	
Name List	UID List
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 baseline	1.2.840.10008.1.2.4.50
JPEG extended (2,4)	1.2.840.10008.1.2.4.51
JPEG extended (3,5)	1.2.840.10008.1.2.4.52
JPEG spectral selection, non-hierarchical (6,8)	1.2.840.10008.1.2.4.53
JPEG spectral selection, non-hierarchical (7,9)	1.2.840.10008.1.2.4.54
JPEG full progression, non-hierarchical (10,12)	1.2.840.10008.1.2.4.55
JPEG full progression, non-hierarchical (11,13)	1.2.840.10008.1.2.4.56
JPEG lossless, non-hierarchical (14)	1.2.840.10008.1.2.4.57
JPEG lossless, non-hierarchical (15)	1.2.840.10008.1.2.4.58
JPEG extended, hierarchical (16,18)	1.2.840.10008.1.2.4.59
JPEG extended, hierarchical (17,19)	1.2.840.10008.1.2.4.60
JPEG spectral selection, hierarchical (20,22)	1.2.840.10008.1.2.4.61
JPEG spectral selection, hierarchical (21,23)	1.2.840.10008.1.2.4.62
JPEG full progression, hierarchical (24,26)	1.2.840.10008.1.2.4.63
JPEG full progression, hierarchical (25,27)	1.2.840.10008.1.2.4.64
JPEG lossless, hierarchical (28)	1.2.840.10008.1.2.4.65
JPEG lossless, hierarchical (29)	1.2.840.10008.1.2.4.66
JPEG lossless, non-hierarchical, first-order prediction	1.2.840.10008.1.2.4.70
RLE compression	1.2.840.10008.1.2.5

3.1.2.1.2.1. SOP Specific Conformance Statement - Storage SOP Class

VIParchive continue to sends images from the same study while the SCP sends successful C-STORE responses.

In case of errors, VIParchive will automatically retry to send unsuccessful images.

Since VIParchive provides full level 2 conformances as a Storage SCP, images sent out by VIParchive are as originally received unless patient demographic information is altered in the VIParchive DICOM database. In this case, original DICOM tags are replaced on the fly by the current database values.

3.1.2.2. Real-World Activity - Querying a Remote DICOM System

3.1.2.2.1. Associated Real-World Activity

VIParchive can query a Remote DICOM System through the mechanism of Query Task. This mechanism intends to populate VIParchive DICOM database with Studies located on the Remote DICOM System.

3.1.2.2.2. Proposed Presentation contexts

Tableau 6 – Proposed Contexts for Querying a Remote DICOM System

Presentation contexts Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Patient/Study Only Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

3.1.2.2.3. SOP Specific Conformance Statement – Query SOP Class

VIParchive Query Task issues queries requests only at the Study Level. The Remote DICOM System is expected to support only single value matching on the Study Date tag.

VIParchive asks for the following keys at the Study Level:

Description	Tag	Type	VR	VM
Patient's Name	(0010,0010)	R	PN	1
Patient ID	(0010,0020)	U	LO	1
Patient's Birth Date	(0010,0030)	O	DA	1
Patient's Sex	(0010,0040)	O	CS	1
Study Date	(0008,0020)	R	DA	1
Study Time	(0008,0030)	R	TM	1
Accession Number	(0008,0050)	R	CS	1
Study ID	(0020,0010)	R	SH	1
Study Instance UID	(0020,000D)	U	UI	1
Modalities in Study	(0008,0061)	O	CS	1-n
Study Description	(0008,1030)	O	LO	1

3.1.2.3. Real-World Activity - Retrieving Images from a Remote DICOM System

3.1.2.3.1. Associated Real-World Activity

VIParchive retrieves images from a Remote DICOM System either when performing a Migration Task.

3.1.2.3.2. Proposed Presentation Contexts

Tableau 7- Proposed Contexts to Retrieve Images from a Remote DICOM System

Presentation contexts Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Patient/Study Only Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

3.1.2.3.2.1. SOP specific conformance statement for SOP Class Retrieve

VIParchive provides standard conformance.

3.1.3. Association Acceptance Policy

VIParchive accepts associations for the following activities:

- Verification of the DICOM communication between a Remote DICOM System and VIParchive
- Storage of images
- Storage Commitment request
- Initiation of a transfer of images to a remote DICOM system when a retrieve request is received

3.1.3.1. Real-World Activity - Verification

3.1.3.1.1. Associated Real-World Activity

VIParchive responds to verification request made by a Remote DICOM System.

3.1.3.1.2. Accepted Presentation Contexts

Tableau 8- Accepted Context for Verification

Presentation contexts Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.100008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.100008.1.2.1		
		Explicit VR Big Endian	1.2.840.100008.1.2.2		

3.1.3.1.2.1. SOP Specific Conformance Statement – Verification SOP Class

VIParchive provides standard conformance.

3.1.3.1.3. Presentation Contexts Acceptance Criterion

There are no specific rules for acceptance and prioritization of Presentation contexts. VIParchive will accept the first proposed Presentation contexts that match any of its accepted Presentation contexts.

3.1.3.2. Real-World Activity: Storage of Images

3.1.3.2.1. Associated Real-World Activity

A Remote DICOM System sends images to VIParchive. Received images are kept in cache until they are indexed. As soon an image is indexed, it is available by Query/Retrieve.

Images already indexed (SOP Instance UID is already in VIParchive DICOM database) are discarded.

A Study is eligible for archiving (i.e. moving from the DICOM cache to VIPanet) when it is considered as totally received, that means no new images for this Study have been restored for an amount of time called archive latency. Alternatively, a Study is considered as totally received when a Storage Commitment specifying a “Referenced Study Component Sequence Attribute” for this study has been issued.

3.1.3.2.2. Accepted Presentation Contexts

Tableau 9 - Accepted Presentation Contexts for Storage of Images

Presentation contexts Table				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Stored Print Storage	1.2.840.10008.5.1.1.27	See below	SCP	None
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	See below	SCP	None
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	See below	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	See below	SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	See below	SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	See below	SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	See below	SCP	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	See below	SCP	None
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	See below	SCP	None
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	See below	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	See below	SCP	None
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	See below	SCP	None
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	See below	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	See below	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	See below	SCP	None
Enhance MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	See below	SCP	None
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	See below	SCP	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	See below	SCP	None
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	See below	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	See below	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	See below	SCP	None
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	See below	SCP	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	See below	SCP	None
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	See below	SCP	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	See below	SCP	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	See below	SCP	None

Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	See below	SCP	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	See below	SCP	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	See below	SCP	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	See below	SCP	None
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	See below	SCP	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	See below	SCP	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	See below	SCP	None
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	See below	SCP	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	See below	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	See below	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	See below	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	See below	SCP	None
X-Ray Angiographic Bi-Plane Image Storage	1.2.840.10008.5.1.4.1.1.12.3	See below	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	See below	SCP	None
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	See below	SCP	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	See below	SCP	None
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	See below	SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	See below	SCP	None
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	See below	SCP	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	See below	SCP	None
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	See below	SCP	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	See below	SCP	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	See below	SCP	None
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	See below	SCP	None
Basic Text Structured Reporting Storage	1.2.840.10008.5.1.4.1.1.88.11	See below	SCP	None
Enhanced Structured Reporting Storage	1.2.840.10008.5.1.4.1.1.88.22	See below	SCP	None
Comprehensive Structured Reporting Storage	1.2.840.10008.5.1.4.1.1.88.33	See below	SCP	None
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	See below	SCP	None
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	See below	SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	See below	SCP	None
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	See below	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	See below	SCP	None
Positron Emission Tomography Curve Storage	1.2.840.10008.5.1.4.1.1.129	See below	SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	See below	SCP	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	See below	SCP	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	See below	SCP	None
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	See below	SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	See below	SCP	None

RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	See below	SCP	None
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	See below	SCP	None

Transfer Syntaxes supported by VIPArchive:

Tableau 10 - Transfer Syntaxes supported for Storage of Images

Transfer Syntax	
Name List	UID List
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 baseline	1.2.840.10008.1.2.4.50
JPEG extended (2,4)	1.2.840.10008.1.2.4.51
JPEG extended (3,5)	1.2.840.10008.1.2.4.52
JPEG spectral selection, non-hierarchical (6,8)	1.2.840.10008.1.2.4.53
JPEG spectral selection, non-hierarchical (7,9)	1.2.840.10008.1.2.4.54
JPEG full progression, non-hierarchical (10,12)	1.2.840.10008.1.2.4.55
JPEG full progression, non-hierarchical (11,13)	1.2.840.10008.1.2.4.56
JPEG lossless, non-hierarchical (14)	1.2.840.10008.1.2.4.57
JPEG lossless, non-hierarchical (15)	1.2.840.10008.1.2.4.58
JPEG extended, hierarchical (16,18)	1.2.840.10008.1.2.4.59
JPEG extended, hierarchical (17,19)	1.2.840.10008.1.2.4.60
JPEG spectral selection, hierarchical (20,22)	1.2.840.10008.1.2.4.61
JPEG spectral selection, hierarchical (21,23)	1.2.840.10008.1.2.4.62
JPEG full progression, hierarchical (24,26)	1.2.840.10008.1.2.4.63
JPEG full progression, hierarchical (25,27)	1.2.840.10008.1.2.4.64
JPEG lossless, hierarchical (28)	1.2.840.10008.1.2.4.65
JPEG lossless, hierarchical (29)	1.2.840.10008.1.2.4.66
JPEG lossless, non-hierarchical, first-order prediction	1.2.840.10008.1.2.4.70
RLE compression	1.2.840.10008.1.2.5

3.1.3.2.2.1. SOP Specific Conformance Statement – Storage SOP Class

VIPArchive provides full level 2 conformances as a Storage SCP.

Type 1, Type 2, and Type 3 attributes defined in the IOD associated with the SOP Class will be stored and may be accessed.

This means that upon sending images to a DICOM Remote System VIPArchive sends out all the attributes it received, unless VIPArchive DICOM database has been updated.

In addition, no private attributes are added.

VIPArchive responds to a C-STORE request with one of these respond codes:

Tableau 11 - Status Code for Storage of Images

Service status	Further Meaning	Status Code (0000,0900)	DICOM Definition
Refused	Out of Resources - There were insufficient resources to process the request. The request was not processed	A700H	PS 3.4, B.2.3
Error	Data Set does not match SOP Class – a required attribute is not present in the message. The request was not processed	A900H	PS 3.4, B.2.3
	Cannot understand – the message was not properly DICOM-encoded. The request was not processed	C000H	PS 3.4, B.2.3
	Processing failure – A condition arose which prevented the processing of the request	0110H	PS 3.7, C.5.21
Success		0000H	PS 3.4, B.2.3


3.1.3.2.3. Presentation Contexts Acceptance Criterion

There are no specific rules for acceptance and prioritization of Presentation contexts. VIParchive will accept the first proposed Presentation contexts that match any of its accepted Presentation contexts.

3.1.3.2.4. Transfer Syntax Selection Policies

The default behavior of VIParchive is to support the Implicit Little Endian transfer syntax for all associations. Some explicit JPEG lossy and lossless compression syntaxes are supported as defined in table 10.

VIParchive can be configured to accept a subset of those syntaxes. In addition, depending of VIParchive Compression Rules, images can be archived into JPEG lossless transfer syntax. When sending images to a Remote DICOM System, VIParchive tries to propose the transfer syntax used for storage. When this transfer syntax does not match the association negotiation result, VIParchive convert the image to a transfer syntax that has been negotiated.

 **Note** – VIParchive compression algorithms are implemented using the Pegasus Imaging Corporation's Medical Image Toolkit.

3.1.3.3. Real-World Activity: Storage Commitment**3.1.3.3.1. Associated Real-World Activity**

VIParchive can confirm the storage of images when it is asked to do so. This commitment means that images are actually archived (not only stored on a disk cache).

3.1.3.3.2. Accepted Presentation Contexts

Tableau 12 - Accepted Contexts for Storage Commitment

Presentation Contexts Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.100008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.100008.1.2.1		
		Explicit VR Big Endian	1.2.840.100008.1.2.2		

3.1.3.3.2.1. SOP Specific Conformance Statement – Storage Commitment Push Model SOP Class

VIParchive open a new association for sending the N-EVENT-REPORT message back to the Remote DICOM System that requested the Storage Commitment. The N-EVENT-REPORT message is sent on a different association than the N-ACTION operation.

VIParchive may receive Storage Commitment requests related to image already archived. In this case, the N-EVENT-REPORT message is sent immediately.

VIParchive may receive Storage Commitment requests before receiving related images. In this case, N-EVENT-REPORT messages are sent as soon as images are received and archived.

VIParchive supports the Referenced Study Component Sequence Attribute by treating it as a Study Instance UID (0020,000D). This attribute is used to activate the archiving of the study. Otherwise, VIParchive waits a certain amount of time called “archive latency” in order to archive the study as a whole (collocation at the study level).

3.1.3.3.3. Presentation contexts acceptance criterion

There are no specific rules for acceptance and prioritization of Presentation contexts. VIParchive will accept the first proposed Presentation contexts that match any of its accepted Presentation contexts.

3.1.3.4. Real-world activity: Querying VIParchive

3.1.3.4.1. Associated real-world activity

A Remote DICOM System connects to VIParchive to query VIParchive.

3.1.3.4.2. Accepted Presentation Contexts

Tableau 13 - Accepted Contexts for Querying VIParchive

Presentation Contexts Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Little Endian	1.2.840.10008.1.2.2		
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.2.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Little Endian	1.2.840.10008.1.2.2		
Patient/Study Only Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Little Endian	1.2.840.10008.1.2.2		

3.1.3.4.2.1. SOP Specific Conformance Statement – Query SOP Class

VIParchive supports by default relational-queries (no need for extended negotiation).

The following tables specify which keys are supported for each level. Because VIParchive supports relational-queries, any combination of those keys is allowed regardless of the query level. All the keys can be queried, except those related to the number of information related to the query. In addition, depending on the VR/VM of the key, different types of matching are supported.

Tableau 14 - Keys supported at the Patient Level

Name	Tag	Type	VR	VM
Patient's Name	(0010,0010)	R	PN	1
Patient ID	(0010,0020)	U	LO	1
Patient's Birth Date	(0010,0030)	O	DA	1
Patient's Birth Time	(0010,0032)	O	TM	1
Patient's Sex	(0010,0040)	O	CS	1
Number of Patient Related Studies	(0020,1200)	O	IS	1
Number of Patient Related Series	(0020,1202)	O	IS	1
Number of Patient Related Instances	(0020,1204)	O	IS	1

Tableau 15 - Keys supported at the Study Level

Description	Tag	Type	VR	VM
Study Date	(0008,0020)	R	DA	1
Study Time	(0008,0030)	R	TM	1
Accession Number	(0008,0050)	R	CS	1
Study ID	(0020,0010)	R	SH	1
Study Instance UID	(0020,000D)	U	UI	1
Modalities in Study	(0008,0061)	O	CS	1-n
Referring Physician's Name	(0008,0090)	O	PN	1
Study Description	(0008,1030)	O	LO	1
Reading Physician's Name	(0008,1060)	O	PN	1
Number of Study related Series	(0020,1206)	O	IS	1
Number of Study related Images	(0020,1208)	O	IS	1
Study Reading Date	(0032,0034)	O	DA	1
Study Reading Time	(0032,0035)	O	TM	1

Tableau 16 - Keys supported at the Series Level

Description	Tag	Type	VR	VM
Modality	(0008,0060)	R	CS	1
Series Number	(0020,0011)	R	IS	1
Series Instance UID	(0020,000E)	U	UI	1
Number of Series Related Instances	(0020,1209)	O	IS	1
Institution Name	(0008,0080)	O	LO	1
Station Name	(0008,1010)	O	SH	1
Body Part Examined	(0018,0015)	O	CS	1
Series Description	(0008,103E)	O	LO	1
Performing Physician's Name	(0008,1050)	O	PN	1
Operator's Name	(0008,1070)	O	PN	1

Tableau 17 - Keys supported at the Composite Object Instance Level

Description	Tag	Type	VR	VM
Instance Number	(0020,0013)	R	IS	1
SOP Instance UID	(0008,0018)	U	UI	1
Acquisition Date	(0008,0022)	O	DA	1

The following types of matching defined in PS 3.4, C.2.2.2 are supported:

- Single Value Matching
- List of UID Matching
- Universal Matching
- Wild Card Matching (“*” and “?”)
- Range Matching (Date and Time)

In addition, two new types of matching are also supported:

- **Partial Single Value Matching:** this type of matching is similar to a sub-string matching. It is not case-sensitive.

This type of matching is useful for querying long string (VR of type LO) like for instance Study Description (0008,1030).

Examples of Partial Single Value Matching:

“HEAD” matches “Head axial”
“renal” matches “MIP renal arteries”

The Single Value Matching can be viewed as a limit case of this matching: any matching which is true for the Single Value Matching is also true for the Partial Single Value Matching. Partial Single Value Matching is used instead of Single Value Matching for relevant attributes (see table 15).

- **Phonetic Matching:** phonetic matching consists in comparing the sound of the words instead of the letters. The algorithm used is the well-known SOUNDEX algorithm.

This type of matching is very useful for querying name:

“! Nitché” matches “Nietzsche”
“! tchkovski” Matches “Tchekovsky”
“! shakespeare” Matches “Shakespeare”

By convention, the special character “!” is used to indicate that a Phonetic Matching is required. The use of this character is similar to the use of special characters for Wild Card Wild Matching. Phonetic Matching can be combined with other type of matching: for instance, “! shakespeare^William” specifies a Phonetic Matching on the family name, and a Single Value Matching on the first name.

Tableau 18 - Types of Matching according to VR

VR Name	Matching
UI - Unique Identifier (UID)	Single Value / List / Universal / Wild Card
PN - Person Name*	Single Value / Universal / Wild Card / Phonetic
SH - Short String	Single Value / Universal / Wild Card
LO - Long String	Partial Single Value / Universal / Wild Card
IS - Integer String	Single Value / Universal / Wild Card
CS - Code String	Single Value / Universal / Wild Card
AS - Age String	Single Value / Universal / Extended Range
DS - Decimal String	Single Value / Universal / Extended Range
DA – Date	Single Value / Universal / Range
TM – Time	Single Value / Universal / Range


 **Note** – Only the two first component groups of the PN VR are matched. If a matching is required on one of the three other component groups, VIParchive issues a warning (Service Status FF01).

Tableau 19 - Status codes for C-FIND response

Service Status	Further Meaning	Status Code (0000,0900)
Refused	Out of Resources	A700
Failed	Identifier does not match SOP Class	A900
	Unable to process	C000
Cancel	Matching terminated due to Cancel request	FE00
Success	Matching is complete – No final identifier is supplied	0000
Pending	Matches are continuing – Current match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00
	Matches are continuing – Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01


3.1.3.4.3. Presentation Contexts Acceptance Criterion

There are no specific rules for acceptance and prioritization of Presentation contexts. VIParchive will accept the first proposed Presentation contexts that match any of its accepted Presentation contexts.

3.1.3.4.4. Transfer Syntax Selection Policies

When executing on a Little Endian machine, Transfer Syntaxes are selected in the following order: Explicit VR Little Endian, Implicit VR Little Endian, and Explicit VR Big Endian.

When executing on a Big Endian machine, Transfer Syntaxes are selected in the following order: Explicit VR Big Endian, Explicit VR Little Endian, and Implicit VR Little Endian.

 **Note** – This order of preference can be configured in the file mergecom.app.

3.1.3.5. Real-World Activity: Retrieving from VIParchive

3.1.3.5.1. Associated Real-World Activity

A Remote DICOM System connects to VIParchive to retrieve images.

3.1.3.5.2. Accepted Presentation Contexts

Tableau 20 - Accepted Contexts for Retrieving from VIParchive

Presentation Contexts Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.2.1.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.3.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

3.1.3.5.2.1. SOP Specific Conformance Statement

VIParchive provides standard conformance.

In addition, VIParchive offers a “wrapping mechanism” used to hide a legacy DICOM System. Although the content of the legacy archive is imported into VIParchive database (by QUERY tasks), images are still located in the legacy archive. When VIParchive receives a C-MOVE request related to an image stored on a remote DICOM System, VIParchive delegates the C-STORE to the remote DICOM system by sending C-MOVE requests.

Tableau 21 - Status codes for C-MOVE response

Service Status	Further Meaning	Status Code (0000,0900)
Refused	Out of Resources – Unable to calculate number of matches	A701
	Out of Resources – Unable to perform sub-operations	A702
	Move Destination unknown	A801
Failed	Identifier does not match SOP Class	A900
	Unable to process	C000
Cancel	Sub-operations terminated due to Cancel request	FE00
Warning	Sub-operations Complete – One or more Failures	B000


3.1.3.5.3. Presentation contexts acceptance criterion

There are no specific rules for acceptance and prioritization of Presentation contexts. VIParchive will accept the first proposed Presentation contexts that match any of its accepted Presentation contexts.

3.1.3.5.4. Transfer Syntax Selection Policies

When executing on a Little Endian machine, Transfer Syntaxes are selected in the following order: Explicit VR Little Endian, Implicit VR Little Endian, and Explicit VR Big Endian.

When executing on a Big Endian machine, Transfer Syntaxes are selected in the following order: Explicit VR Big Endian, Explicit VR Little Endian, and Implicit VR Little Endian.

 **Note** – This order of preference can be configured in the file mergecom.app.

4. COMMUNICATION PROFILES

4.1. Supported Communication Stacks

VIParchive in conjunction with MERGE-3 provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.2. TCP/IP Stack

VIParchive uses MERGE-3 to communicate over the TCP/IP protocol stack on any physical interconnection media supporting the TCP/IP stack. MERGE-3 inherits the TCP/IP stack from the host operating system upon which it executes.

4.2.1. Physical Media Support

VIParchive is indifferent to the physical medium over which TCP/IP executes; it inherits this from the operating system on which it exists.

5. EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

5.1. Standard Extended/Specialized/Private SOP Classes

5.1.1. *Kodak DirectView* PACS Private Series Root Query/Retrieve Information Model SOP Class Group

Support of this private SOP Class intends to supports Query/Retrieve from a *Kodak DirectView* PACS.

In the *Kodak DirectView* PACS Private Series Root Query/Retrieve Information Model, the information is arranged into two levels, which correspond to one of the following two values in element (0008, 0052):

Tableau 22 - *Kodak DirectView* PACS Private Series Root Query/Retrieve Levels

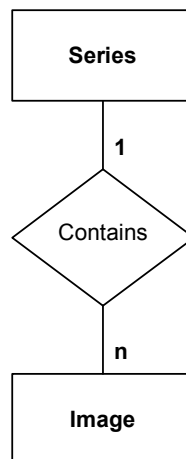
Query/Retrieve Level	Value in (0008, 0052)
Series Information	SERIES
Composite object instance Information	IMAGE

5.1.1.1. Series Root Query/Retrieve Information Model

5.1.1.1.1. E/R Model

The Series Root Query / Retrieve Information Model may be presented by the entity relationship diagram shown in figure 2.

Figure 2 - *Series Root Query/Retrieve Information Model* E/R Diagram



5.1.1.1.2. Series Level

The following table defines the keys at the series information level of the Series Root Query/Retrieve Information Model:

Tableau 23 - Series Level Keys for the Series Root Query/Retrieve Information Model

Description	Tag	Type	VR	VM
Patient's Name	(0010,0010)	R	PN	1
Patient ID	(0010,0020)	U	LO	1
Patient's Birth Date	(0010,0030)	O	DA	1
Patient's Sex	(0010,0040)	O	CS	1
Study Date	(0008,0020)	R	DA	1
Study Time	(0008,0030)	R	TM	1
Accession Number	(0008,0050)	R	CS	1
Study ID	(0020,0010)	R	SH	1
Study Instance UID	(0020,000D)	U	UI	1
Modalities in Study	(0008,0061)	O	CS	1-n
Referring Physician's Name	(0008,0090)	O	PN	1
Study Description	(0008,1030)	O	LO	1
Modality	(0008,0060)	R	CS	1
Series Number	(0020,0011)	R	IS	1
Series Instance UID	(0020,000E)	U	UI	1
Institution Name	(0008,0080)	O	LO	1
Body Part Examined	(0018,0015)	O	CS	1
Study Reading Date	(0032,0034)	O	DA	1
Study Reading Time	(0032,0035)	O	TM	1

5.1.1.1.3. Image Level

Attributes for the Composite object instance Level of the *Kodak DirectView* PACS Private Series Root Query/Retrieve Information Model are the same as the Attributes for the Composite object instance Level of the Study Root Query/Retrieve Information Model.

Scope of the C-MOVE Commands and Sub-Operations

A C-MOVE request may be performed to any level of its Query/Retrieve Model. However, the transfer of stored SOP instances takes always place at the image level. A C-MOVE where the Query/Retrieve level is the:

- SERIES level indicates that all images related to a series shall be transferred
- IMAGE level indicates that selected individual images shall be transferred

5.1.1.2. SOP Classes

The SOP Classes in the Kodak DirectView PACS Private Series Root SOP Class Group of the Query/Retrieve Service Class identify the Kodak DirectView PACS Private Series Root Query/Retrieve Information Model, and the DIMSE-C operations supported. The following Kodak DirectView PACS Private SOP Classes are identified:

Tableau 24 - Series Root Query/Retrieve SOP Classes

SOP Class UID	SOP Class Name
1.2.840.113674.5.1.4.1.2.4.1	Series Root Query/Retrieve Information Model - FIND
1.2.840.113674.5.1.4.1.2.4.2	Series Root Query/Retrieve Information Model - MOVE

5.2. Private transfer syntaxes

None supported.

6. CONFIGURATION

6.1. AE Title/Presentation address mapping

The mapping from AE Title to TCP/IP addresses and ports is configurable and set at the installation time by Kodak field engineers.

6.2. Configurable parameters

VIParchive can be configured through two types of parameters:

- Initialization Parameters
- Dynamic Parameters


6.2.1. Initialization Parameters

Initialization parameters are specified in configuration files. Those parameters are read when VIParchive processes are started.

To change initialization parameters, VIParchive processes must be restarted.

There are three parameters files:

File Name	Example of Parameters
uma.conf	AE Title, port, Max. Number of concurrent association as an SCP, Min. Disk space required for services to run...
Mergecom.app	Services Lists and Transfer Syntaxes Lists
Mergecom.pro	DUL parameters, PDU size, DIMSE parameters...

 **Warning – Most parameters in these files should NEVER be changed.** Doing so could break the DICOM conformance. Therefore, only KODAK field engineers must modify these files.

6.2.2. Dynamic Parameters


Dynamic Parameters can be set through VIParchive Watch CM Web based tool. Changes are automatically taken into account without restarting VIParchive processes.

Examples of dynamic parameters:

- DICOM peers declarations
- Archive latency, Retry intervals
- Routing rules
- Query, migration and forwarding tasks declarations

7. SUPPORT OF EXTENDED CHARACTER SETS

By default, VIParchive supports the ISO-IR 100 Latin-1 supplementary character set.

 **Note** – Other character sets (e.g. Asiatic character sets) can be supported but required specific installations.

8. SUPPORT OF WADO

VIParchive supports a subset of the web access specified in DICOM Part 18, "Web Access to DICOM Persistent Objects" (WADO). The parameters which are supported are the mandatory parameters "requestType", "studyUID", "seriesUID" and "objectUID":

- The "Accept-charset" field of the GET method request is ignored: responses are sent using the character set specified in the archived object.
- The "Accept " field of the GET method request must include the value "application/dicom".
- The "contentType" parameter is ignored: responses are always sent using the content type "application/dicom".
- Requests are rejected if they specify one of the following parameters:
 - charset
 - anonymise
 - annotation
 - rows
 - columns
 - region
 - windowCenter
 - windowWidth
 - frameNumber
 - imageQuality
 - presentationUID
 - presentationSeriesUID
 - transferSyntax

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