

Mirage

DICOM 3.0

Conformance Statement

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Revision 5

History

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4/22/99	Rev 1	DICOM conformance with Mirage version 3
3/29/00	Rev 2	Added supported DICOM functionality in Mirage V4.31
4/29/01	Rev 3	Added support for printing to DICOM Printer
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Introduction

This Conformance Statement specifies the manner in which Mirage DICOM Server complies with the DICOM standard. This document is written in conformance with DICOM Part 2 (PS3.2).

It is assumed that readers of this document are familiar with the DICOM standard and with the terminology and concepts used in that standard.

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started. The DICOM Server is listening indefinitely on a predefined port, which is terminated when the main Mirage application is stopped.

The Mirage DICOM Server AE will be able to establish a DICOM Association with any remote host, which supports the DICOM Verify, Storage, Query-Retrieve, Modality Worklist, and Print Management Service Classes. This AE will be able to acknowledge and establish a DICOM Association initiated by a remote server for DICOM Verify, Storage and Query Retrieve Services only.

All the images received by this entity, either by way of DICOM Query-Retrieve Service class or by way of an independent Storage request by the remote host, will be stored in the Mirage Local Database.

Any Remote DICOM Server can query the Mirage Local Database using DICOM Query-Retrieve Service Class. The images stored in the Mirage Local Database can also be pushed to the configured DICOM host using the DICOM Storage Service Class.

Mirage can send the results “page” created by the mirage application to the DICOM printer. The DICOM printer can be configured via the tray icon.

Mirage can also send a worklist request to the remote host using the DICOM protocol. This enables the user to import the patient and study data from the information management system to the mirage database.

1.3 Sequencing of Real-Word Activities

Not Applicable.

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2 AE Specifications

The Mirage DICOM Server AE provides standard conformance to the following DICOM V3.0 SOP Class in the SCU and SCP role:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Nuclear Medicine Image Information Object -Storage	1.2.840.10008.5.1.4.1.1.20
Query/Retrieve Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1
Query/Retrieve Study Root MOVE	1.2.840.10008.5.1.4.1.2.2.2

The Mirage DICOM Server AE provides standard conformance to the following DICOM V3.0 SOP classes only in the SCU role:

SOP Class Name	SOP Class UID
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
Modality Worklist Management SOP Class	1.2.840.10008.5.1.4.31

2.1 Association Establishment Policies

2.1.1 General

The Mirage AE and the Mirage DICOM server AE can initiate and/or accept DICOM association only under the standard DICOM Application Context Name (ACN):

Application Context Name	1.2.840.10008.3.1.1.1
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2.1.2 Number of Associations

The number of simultaneous associations that will be accepted by Mirage DICOM server is configurable. However, the default is 2.

2.1.3 Asynchronous Nature

Not Applicable

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2.1.4 Implementation Identifying Information

The AE Title used by the Mirage DICOM Server is set in a configuration file. The AE Title, by default is the station name where the server is running.

The Mirage DICOM Server uses an implementation UID identifying the different DICOM services it supports.

Implementation UID	1.2.840.114080.1.0.2
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2.2 Association Initiation Policy

The Mirage AE initiates the establishment of DICOM Association to issue the DICOM Storage (C-STORE) request. The Mirage DICOM Server initiates the establishment of DICOM association to issue the following DICOM requests:

- Verification (C-Echo)
- Storage (C-STORE)
- Query and Modality Worklist (C-FIND)
- Retrieve (C-MOVE)
- Print (N-Create, N-Action, N-Get, N-Delete, N-Set)

2.2.1 Associated Real-Word Activity

The Mirage DICOM Server User can verify the existence of the remote DICOM Server by sending a C-Echo request on a successful established Association. The user also initiates the establishment of an Association when a particular image from the local database is to be transferred to the remote host. This functionality is same in Mirage AE and the Mirage DICOM Server AE. Mirage DICOM Server also initiates the opening of the Association when the user issues a normal or a worklist query, and/or a retrieve request to the remote database. Finally, the server also initiates the opening of the Association with a DICOM printer when invoked by the user to print the images.

2.2.2 Presentation context table

The Mirage DICOM server will propose a single Presentation Context for the Association as defined by Table 1:

Presentation context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

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Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Print Management	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Modality Worklist Management	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Table 1 Proposed Presentation Context

Note: Other modalities (CT, MR...) presentation contexts are accepted but without any guaranty about completeness of the mapping once imported in Mirage patient database.

2.2.2.1 SOP Specific Conformance to Basic Grayscale Print Management Meta SOP Class

Mirage DICOM print server supports the following mandatory SOP classes which are defined under the Basic Grayscale Print Management Meta SOP Class:

SOP Class Name	SOP Class UID
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
Printer SOP Class	1.2.840.10008.5.1.1.14

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2.2.2.2 SOP Specific Conformance to Basic Color Print Management Meta SOP Class

Mirage DICOM print server supports the following mandatory SOP classes which are defined under the Basic Color Print Management Meta SOP Class:

SOP Class Name	SOP Class UID
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
Printer SOP Class	1.2.840.10008.5.1.1.14

2.2.3 SOP Specific Conformance

Mirage conforms to the definition of an SCU of the Verification SOP Class in accordance with the DICOM Standard.

Mirage as an SCU of the Storage SOP Class enables the transfer of images, including secondary capture from its local database to the selected remote host. Any unsuccessful is reported and no action is taken upon the receipt of a C-STORE successful message or warning response status.

The Mirage DICOM Server conforms to the definition of an SCU of the Query (C-FIND) and Retrieve (C-Move) Service in accordance with the DICOM standard. Mirage supports queries against the Study Root Information Model. Mirage can send queries at Study, Series and Image Level in the Study Root FIND SOP Class.

Mirage can also send a Retrieve (C-MOVE) request in the SCU role requesting the remote host to transfer a particular Image. All the images received in entirety will be updated and mapped to the Mirage Local database and a successful C-STORE message sent to the requester. However, if the image cannot be received properly due to insufficient disk space or other protocol errors, Mirage sends back an unsuccessful C-STORE message.

Mirage can send the bmp file created by the mirage application to the DICOM printer using the N-Set, N-Create, N-Get, N-Delete and N-Action services. The N-Get service is used to get the printer parameters while N-Create service is used to create the Film Session and Film Box. N-Set service is used to set the Image Box and N-action to print the images. Finally N-Delete service is used to delete the print object/instance on the printer.

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Mirage can also send a worklist request to the remote host using the DICOM protocol. This enables the user to import the patient and study data from the information management system to the mirage database.

2.3 Association Acceptance Policy

The Mirage DICOM server accepts an association to acknowledge the DICOM Verify (C-Echo) service, to respond to the DICOM Query (C-FIND) Service, to respond to Retrieve (C-MOVE) Service. Mirage also accepts an association to receive (C-STORE) the images sent from the remote host.

2.3.1 Associated Real-Word Activity

The Mirage DICOM Server will acknowledge and establish an Association whenever any remote DICOM server wants to verify its existence and transfer some images using the standard DICOM C-STORE request. Mirage will also accept Association to service the query/retrieve requests against its local database.

2.3.2 Presentation context table

The Presentation Context accepted by Mirage DICOM server, while trying to acknowledge the establishment of the Association, are shown in Table 2.

Presentation context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

Table 2 Acceptable Presentation Context

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Note: Other modalities (CT, MR...) presentation contexts are accepted but without any guaranty about completeness of the mapping once imported in Mirage patient database.

2.3.3 SOP Specific Conformance

Mirage DICOM Server conforms to the definition of a SCP of the Verification SOP Class in accordance with the DICOM Standard.

Mirage DICOM server provides standard conformance to the DICOM Storage Service Class in the SCP role. All the images received in entirety will be updated and mapped to the Mirage Local database, with the restriction that elements having no mapping in Mirage patient database are discarded. However, if the image cannot be received properly due to insufficient disk space or other protocol errors, Mirage sends back an unsuccessful C-STORE message

2.3.4 Presentation Context Acceptance Criterion

Mirage DICOM server accepts Presentation Contexts specified in Table 2. It examines proposed Presentation Contexts in the order proposed. The first acceptable Presentation Context determines the Abstract Syntax, which will be used for association, as well as the transfer syntax that will be used.

2.3.5 Transfer Syntax Selection Policies

Mirage accepts the transfer syntax in the order they are proposed. By default, however, the DICOM default Transfer Syntax is accepted.

3 Communication Profiles

3.1 Supported Communication Stacks

Mirage DICOM server implementation provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM standard.

3.2 TCP/IP Stack

Mirage DICOM server implementation is indifferent to the physical medium over which TCP/IP executes.

4 Extension/Specialization/Privatization

There is no Extension, Specialization nor Privatization in Mirage DICOM server implementation.

5 Configuration

Mirage DICOM server fetches the serving port number and the AE title from Mirage configuration files. However, these parameters are modify-able by the

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user from the Tray Icon. The total number of simultaneous Associations acceptable is also configurable from this Tray Icon.

6 Support of Extended Character Sets

Extended character sets are not supported by the current implementation.