

SIENET MagicWeb VA21D

HS

DICOM Conformance Statement

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IMS P

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Date:	Date:
Signature:	Signature:

History

Document History

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1 Introduction

This documents describes the DICOM implementation of the Product "MagicWeb VA21A". The DICOM implementation consists of four separate components:

DICOM Store SCP

This component acts as a DICOM storage class provider for DICOM nodes who want to store images on the MagicWeb server.

DICOM Query

This component is initiated by the Web-Client, and performs a DICOM Query to other DICOM nodes.

DICOM Retrieve

This component is also initiated by the Web-Client, and its purpose is to retrieve images from a remote DICOM node.

DICOM Report

This component is also initiated by the WEB-Client, and its purpose is to retrieve reports from Mitra Broker[1].

1.1 Definitions, Acronyms and Abbreviations

1.1.1 Definitions

n.a.

1.1.2 Acronyms and Abbreviations

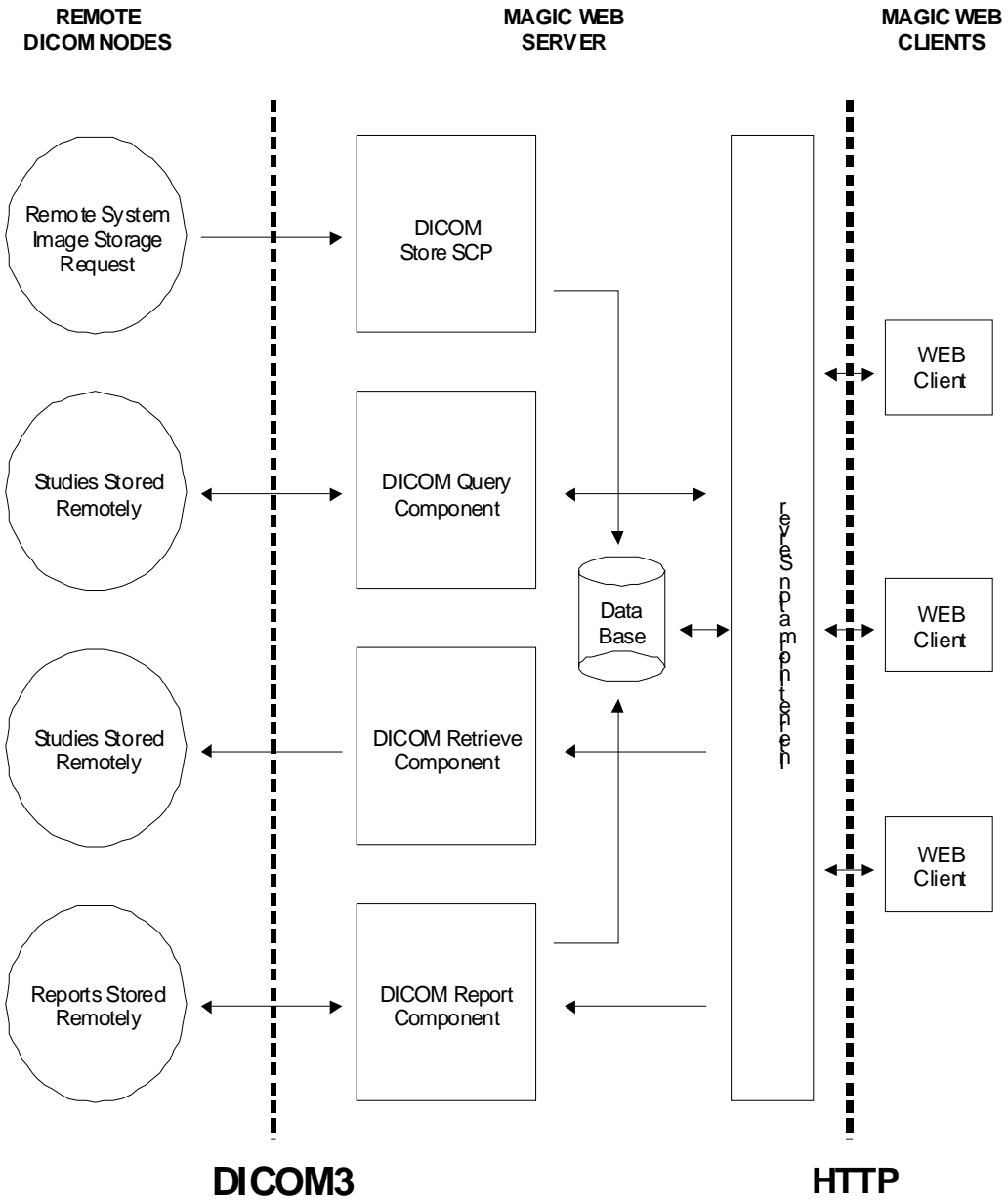
AE	Application Entity
AET	Application Entity Title
DICOM	Digital Imaging and Communications in Medicine
IP	Internet Protocol
JPEG	Joint Pictures Expert Group
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP	Transmission Control Protocol
UID	Unique Identifier

1.2 References

- [1] Mitra Broker Conformance Statement for PACS Broker 1.5.2, Revision 4.7
- [2] DICOM Standard 1999 PS 3.1 - 3.14

2 Implementation Model

2.1 Application Data Flow Diagram



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2.2 Functional Definitions of AE's

DICOM Store SCP

This component waits for another application to connect at the presentation address configured for its Application Entity Title. Whenever another application connects, DICOM Store SCP expects it to be a DICOM application. DICOM Store SCP will accept associations with Presentation Contexts for SOP Classes of the Storage Service Class. It will receive images on these Presentation Contexts and write them to files in the format specified in PS 3.10 [2].

Additionally, another MagicWeb component will extract patient demographic data from those files and store them in the MagicWeb database.

DICOM Query / DICOM Retrieve

The DICOM Query / Retrieve components acting as a SCU are able to send DICOM Query / Retrieve requests to a remote application. They support the Study Root Query / Retrieve Information Model specified in PS 3.4 [2], but only at the study level.

Because the Query / Retrieve is issued by Web Components, they are realized in two separate components. So it is possible that one MagicWeb client is querying for studies while another MagicWeb client retrieves studies.

Here in the conformance statement they are treated as one component.

DICOM Report

The DICOM Report component acts as a SCU of a private SOP Class of the Mitra Broker[1].

So it is possible to get the available reports belonging to a given Patient ID and Accession Number and merging it to an already stored Study in the MagicWeb database.

2.3 Sequencing of Real-World Activities

not applicable

3 AE Specifications

3.1 DICOM Store SCP

The DICOM Store SCP provides Standard Conformance to the following DICOM V3.0 SOP Classes as a SCP:

MagicWeb Basic Version

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
CR Storage	1.2.840.10008.5.1.4.1.1.1
CT Storage	1.2.840.10008.5.1.4.1.1.2
MR Storage	1.2.840.10008.5.1.4.1.1.4
US Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
US Storage	1.2.840.10008.5.1.4.1.1.6.1
SC Storage	1.2.840.10008.5.1.4.1.1.7
US Multi-frame Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
US Multi-frame Storage	1.2.840.10008.5.1.4.1.1.3.1
NM Storage	1.2.840.10008.5.1.4.1.1.20

MagicWeb Radiology Version

This version provides the following additional SOP Classes as a SCP.

SOP Class Name	SOP Class UID
X-Ray Angiographic Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray RF Storage	1.2.840.10008.5.1.4.1.1.12.2

3.1.1 Association Establishment Policies

3.1.1.1 General

DICOM Store SCP will accept associations in order to provide the SOP classes listed in the table above.

The minimum PDU size is 8192 Bytes, maximum PDU size is 65536 Bytes. The default size is 16384 Bytes.

3.1.1.2 Number of Associations

The maximum number of associations is configurable, limited to 16.

3.1.1.3 Asynchronous Nature

not applicable.

3.1.1.4 Implementation Identifying Information

The DICOM Store SCP will provide an implementation class UID which is 1.3.12.2.1107.5.8.5.2.2000.3.29, and an implementation version name of MW_O_DTK_331.

3.1.2 Association Initiation by Real-World Activity

DICOM Store SCP never initiates an Association.

3.1.3 Association Acceptance Policy

When DICOM Store SCP accepts an association, it will receive any images transmitted on that association and store them on the harddisk of the MagicWeb server in the format specified by PS 3.10 [2]. The number of simultaneous connects that DICOM Store SCP allows, is configurable. DICOM Store SCP places no limitations on who may connect to it.

3.1.3.1 Real-World Activity - Receive C-ECHO

3.1.3.1.1 Associated Real-World Activity

The Real-World activity associated with the C-ECHO operation is responding to a C-ECHO request from a remote DICOM node.

3.1.3.1.2 Presentation Context Table

Any of the Presentation Contexts shown in the following Table are acceptable for DICOM Store SCP to receive the verification request

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
Verification	1.2.840.10008.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

3.1.3.1.3 SOP Specific Conformance to Verification SOP Class

DICOM Store SCP provides standard conformance to the DICOM Verification SOP Class.

3.1.3.1.4 Presentation Context Acceptance Criterion

DICOM Store SCP accepts all presentation contexts listed in the table above.

3.1.3.1.5 Transfer Syntax Selection Policies

DICOM Store SCP will select the first acceptable transfer syntax (see table above) which is offered by the connected SCU.

3.1.3.2 Real-World Activity - Receive C-STORE

3.1.3.2.1 Associated Real-World Activity

The Real-World activity associated with the C-STORE operation is the storage of an image on the MagicWeb server. DICOM Store SCP will issue a failure status if it is unable to store an image on the harddisk.

3.1.3.2.2 Presentation Context Table

Any of the Presentation Contexts shown in the following Table are acceptable for DICOM Store SCP to receive images.

.MagicWeb Basic Version:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
CR Image	1.2.840.10008.5.1.4.1.1.1	see table below	see table below	SCP	None
CT Storage	1.2.840.10008.5.1.4.1.1.2	see table below	see table below	SCP	None
MR Storage	1.2.840.10008.5.1.4.1.1.4	see table below	see table below	SCP	None
US Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	see table below	see table below	SCP	None
US Storage	1.2.840.10008.5.1.4.1.1.6.1	see table below	see table below	SCP	None
SC Storage	1.2.840.10008.5.1.4.1.1.7	see table below	see table below	SCP	None
US Multi-frame Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	see table below	see table below	SCP	None
US Multi-frame Storage (Retired)	1.2.840.10008.5.1.4.1.1.3.1	see table below	see table below	SCP	None
NM Storage	1.2.840.10008.5.1.4.1.1.20	see table below	see table below	SCP	None

MagicWeb Cardiology Version

This version provides the following additional presentation contexts::

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
X-Ray Angiographic Storage	1.2.840.10008.5.1.4.1.1.12.1	see table below	see table below	SCP	None
X-Ray RF Storage	1.2.840.10008.5.1.4.1.1.12.2	see table below	see table below	SCP	None

Each of the storage SOP classes listed above may be transferred using one of the following Transfer Syntaxes:

Transfer Syntax Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
Default lossless JPEG Compressed	1.2.840.10008.1.2.4.70
Default lossy JPEG Compressed	1.2.840.10008.1.2.4.50

Transfer Syntax Name	UID
RLE Compressed	1.2.840.10008.1.2.5

3.1.3.2.3 SOP Specific Conformance to Storage SOP Classes

DICOM Store SCP conforms to the SOP's of the Storage Service Class at Level 2 (Full). No elements are discarded or coerced by DICOM Store SCP. In the event of a successful C-Store operation, the image has been successfully written to the hard drive as a DICOM file specified in PS 3.10 [2].

Caution: MagicWeb is not an archive like a PACS. Normally, no images are stored forever!

DICOM Store SCP returns following DICOM states:

Success: 0x0000

Error: 0xA700 Out of Resource (there is not enough space to store the image)

Restriction:

DICOM Store SCP accepts all SOPs of the presentation context table above, regardless of their photometric interpretation. But RADIN is only able to work with following photometric interpretation models:

- MONOCHROME1
- MONOCHROME2
- PALETTE COLOR
- RGB

3.1.3.2.4 Presentation Context Acceptance Criterion

DICOM Store SCP accepts all presentation contexts listed in the table above.

3.1.3.2.5 Transfer Syntax Selection Policies

DICOM Store SCP will select the first acceptable transfer (see table above) syntax which is offered by the connected SCU.

3.2 DICOM Query / Retrieve

The DICOM Query / Retrieve provides Standard Conformance to the following DICOM V3.0 SOP Classes as a SCU:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

3.2.1 Association Establishment Policies

3.2.1.1 General

DICOM Query / Retrieve will initiate associations in order to provide the service classes listed in the table above.

The minimum PDU size is 8192 Bytes, maximum PDU size is 65536 Bytes. The default size is 16384 Bytes.

3.2.1.2 Number of Associations

There is only one association for query and a second one for retrieve. That means, if one association for query is active, no further associations for query are possible. An association for retrieve is possible at this time, if two different AETs for query and retrieve are defined. If not, there is also no association for retrieve possible. All other queries and retrieves are queued.

3.2.1.3 Asynchronous Nature

Not applicable.

3.2.1.4 Implementation Identifying Information

The DICOM Query / Retrieve will provide an implementation class UID which is 1.3.12.2.1107.5.8.5.2.2000.3.29, and an implementation version name of MW_O_DTK_331.

3.2.2 Association Initiation by Real-World Activity

DICOM Query / Retrieve initiates an association to

- send a C-ECHO command to test a remote application or
- query a remote application via C-FIND or
- retrieve studies from a remote DICOM node via C-MOVE

3.2.2.1 Real-World Activity - Send C-ECHO

3.2.2.1.1 Associated Real-World Activity

DICOM Query / Retrieve sends a C-ECHO Request to check the remote DICOM node if it is available for this AET.

3.2.2.1.2 Proposed Presentation Contexts

DICOM Query / Retrieve will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
Verification	1.2.840.10008.1.1	Explicit Little Endian	1.2.840.10008.1.2.1	SCU	None

3.2.2.1.3 SOP Specific Conformance Statement for SOP Class Verification

DICOM Query / Retrieve provides standard conformance to the DICOM Verification Service Class.

3.2.2.2 Real-World Activity - Send C-FIND

3.2.2.2.1 Associated Real-World Activity

DICOM Query / Retrieve sends a C-FIND Request to query the remote DICOM node for a specified study.

3.2.2.2.2 Proposed Presentation Contexts

DICOM Query / Retrieve will propose Presentation Contexts as shown in the following table:

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

3.2.2.2.3 SOP Specific Conformance Statement for SOP Class FIND

DICOM Query / Retrieve provides standard conformance.

Only queries at study level will be executed.

The table below show the attributes to be matched.

Attribute	DICOM Tag	matching
Patient's Name	(0010,0010)	wild card
Patient ID	(0010,0020)	wild card
Accession Number	(0008,0050)	wild card
Study ID	(0020,0010)	wild card
Date of Study	(0008,0020)	range
Referring Physician's Name	(0008,0090)	wild card
Patient Comments	(0010,4000)	wild card
Study Description	(0008,1030)	wild card

The table below shows the attributes which are only queried.

Study Instance UID	(0020,000D)
Time of Study	(0008,0030)
Patient's Birth Date	(0010,0030)
Patient's Sex	(0010,0040)
Number of Study Related Images	(0020,1208)

The table below shows the attributes, which are only read if present (not in Query request).

Storage File-Set ID	(0088,0130)
---------------------	-------------

Note: If the remote DICOM node is a SIENET(Archive, the attribute "Storage File-Set ID" (0088,0130) is used to show the archive status. Following archive states are defined by SIENET(Archive:

- ONLINE
- NEARLINE
- OFFLINE

3.2.2.3 Real-World Activity - Send C-MOVE

3.2.2.3.1 Associated Real-World Activity

DICOM Query / Retrieve sends a C-MOVE Request to retrieve the requested study from the remote DICOM node.

3.2.2.3.2 Proposed Presentation Contexts

DICOM Query / Retrieve will propose Presentation Contexts as shown in the following table:

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

3.2.2.3.3 SOP Specific Conformance Statement for SOP Class Move

DICOM Query / Retrieve initiates the C-MOVE only at study level.

DICOM Query / Retrieve supports no Store association, therefore the DICOM Store SCP shall be used!

That means, a remote DICOM server has to be able to build an association for the C-STORE with the DICOM Store SCP.

3.2.3 Association Acceptance Policy

DICOM Query / Retrieve never accepts an association.

3.3 DICOM Report

The DICOM Report provides Standard Conformance to the following DICOM V3.0 SOP Classes as a SCU:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1

The DICOM Report provides Conformance to the following Mitra Broker[1] Private SOP Classes as a SCU:

SOP Class Name	SOP Class UID
Mitra Report Management	1.2.840.113532.3500.8

3.3.1 Association Establishment Policies

3.3.1.1 General

DICOM Report will initiate associations in order to provide the service classes listed in the table above.

The minimum PDU size is 8192 Bytes, maximum PDU size is 65536 Bytes. The default size is 16384 Bytes.

3.3.1.2 Number of Associations

There is only one association for the Report Query. All other queries will be queued.

3.3.1.3 Asynchronous Nature

Not applicable.

3.3.1.4 Implementation Identifying Information

The DICOM Report will provide an implementation class UID which is 1.3.12.2.1107.5.8.5.2.2000.3.29, and an implementation version name of MW_O_DTK_331.

3.3.2 Association Initiation by Real-World Activity

DICOM Report initiates an association to

- send a C-ECHO command to test a remote application or
- query a remote application for report information via C-FIND

3.3.2.1 Real-World Activity - Send C-ECHO

3.3.2.1.1 Associated Real-World Activity

DICOM Report sends a C-ECHO Request to check the remote DICOM node if it is available for this AE.

3.3.2.1.2 Proposed Presentation Contexts

DICOM Report will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit Little Endian	1.2.840.10008.1.2	SCU	None

3.3.2.1.3 SOP Specific Conformance Statement for SOP Class Verification

DICOM Report provides standard conformance to the DICOM Verification Service Class.

3.3.2.2 Real-World Activity - Send C-FIND

3.3.2.2.1 Associated Real-World Activity

DICOM Report sends a C-FIND Request to query the remote Mitra Broker[1] node for specified reports.

3.3.2.2.2 Proposed Presentation Contexts

DICOM Report will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Mitra Report Management	1.2.840.113532.3500.8	Implicit Little Endian	1.2.840.10008.1.2	SCU	None

3.3.2.2.3 SOP Specific Conformance Statement for SOP Class Mitra Report Management

DICOM Report provides private conformance to the Mitra Broker [1].

There is only one query to get report information.

The table below shows the attributes to be matched.

Attribute	DICOM Tag	matching
Patient's Name	(0010,0010)	wild card
Patient ID	(0010,0020)	single value
Accession Number	(0008,0050)	single value
Study ID	(0020,0010)	wild card

Note: One or more of the Accession Number or Patient ID are required!

The table below show the attributes, which are only queried.

Specific Character Set	(0008,0005)
Impressions	(4008,0300)
Interpretation Text	(4008,010B)

3.3.3 Association Acceptance Policy

DICOM Report never accepts an association.

4 Communication Profiles

4.1 Supported Communication Stacks (Parts 8)

All MagicWeb DICOM components provide DICOM 3 TCP/IP network communication support as defined in PS 3.8 [2].

4.2 TCP/IP Stack

All MagicWeb DICOM components inherit their TCP/IP stack from the Windows NT(operating system upon which they execute.

4.2.1 Physical Media Support

All MagicWeb DICOM components are indifferent to the physical medium over which TCP/IP executes; they inherit this from the Windows NT(operating system upon which they execute.

5 Extensions/Specializations/Privatizations

Not Applicable

6 Configuration

6.1 DICOM Store SCP

The MagicWeb DICOM Store SCP component obtains its configuration from parameters in the registry of Windows NT(. These parameters can be configured with a Web interface.

6.1.1 AE Title/Presentation Address Mapping

The following Application Entity/Address Mapping parameters are configurable for the DICOM StoreSCP component:

- Own Application Entity Title
- TCP/IP port

There are no restrictions of AET's of remote DICOM nodes.

6.1.2 Configurable Parameters

Additionally, the following operational parameters are configurable with the Administration Web Interface:

- Number of simultaneous associations
- Maximum PDU size

6.2 DICOM Query/Retrieve

The MagicWeb DICOM Query/Retrieve component obtains its configuration from parameters in the registry of Windows NT(. These parameters can be configured with a Web interface.

6.2.1 AE Title/Presentation Address Mapping

The following Application Entity/Address Mapping parameters are configurable for the DICOM Query/Retrieve component:

- Own Application Entity Title (Query)
- Own Application Entity Title (Retrieve)
- Remote Application Entity Titles

- TCP/IP ports

- Remote Host names or TCP/IP addresses

6.2.2 Configurable Parameters

Additionally, the following operational parameters are configurable with the Administration Web Interface:

- Read timeout
- Connect timeout
- Maximum PDU size

6.3 DICOM Report

The MagicWeb DICOM Report component obtains its configuration from parameters in the registry of Windows NT(. These parameters can be configured with a Web interface.

6.3.1 AE Title/Presentation Address Mapping

The following Application Entity/Address Mapping parameters are configurable for the DICOM Report component:

- Own Application Entity Title
- Remote Application Entity Title

- TCP/IP port

- Remote Host name or TCP/IP address

There is only one remote AE configurable.

6.3.2 Configurable Parameters

Additionally, the following operational parameters are configurable with the Administration Web Interface:

- Read timeout
- Connect timeout
- Maximum PDU size

7 Support of Extended Character Sets

7.1 DICOM StoreSCP

The MagicWeb DICOM Store SCP component is indifferent to Extended Character Sets, as it does not process any information contained within the data elements.

7.2 DICOM Query/Retrieve

The MagicWeb DICOM Query/Retrieve component does support ISO 100 Latin 1 Character Set. The use of any other extended character sets may produce incorrect and unreadable output on the Web interface.

7.3 DICOM Report

The MagicWeb DICOM Report component does support ISO 100 Latin 1 Character Set. The use of any other extended character sets may produce incorrect and unreadable output on the Web interface.

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