
HIMSS and RSNA
Integrating the Healthcare Enterprise

IHE/MESA Report Repository
Tests

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1 Report Repository Tests

The MESA tools are installed on a computer referred to as the MESA test system. The tools are written under the assumption that this computer is distinct from your Report Repository (the system under test). If you choose to run the MESA tools on the same system as your Report Repository, you are likely to have conflicts in port assignments. You will need to use different port numbers for your application because the MESA applications use hard-wired port numbers.

1.1 Introduction

Report Repositories are tested on responses to C-Find requests and C-Move requests. Each test is run using the same procedure. We assume you are using an interactive terminal or terminal emulator and are logged on to the MESA test system. Change directory to *\$MESA_TARGET/ mesa_tests/rad/actors/rpt_repos*.

1.1.1 Integration Profiles and Test Procedures

This document lists a number of tests for Report Repository Systems. You may not be responsible for all of these tests.

Please refer to the Connectathon web tool to list the required tests for your system. The web address of this tool depends on the year and project manager. Please contact the appropriate project manager to obtain this information.

1.2 Message Attributes

These tests will query the Report Repository for attributes using the DICOM C-Find command. The table below lists the attributes used in the queries.

| Attribute Name | Tag |
|----------------------------|-----------|
| Study Level | |
| Study Date | 0008 0020 |
| Study Time | 0008 0030 |
| Accession Number | 0008 0050 |
| Patient Name | 0010 0010 |
| Patient ID | 0010 0020 |
| Study ID | 0020 0010 |
| Study Instance UID | 0020 000D |
| Modalities in Study | 0008 0061 |
| Referring Physician's Name | 0008 0090 |
| Patient's Birth Date | 0010 0030 |

| | |
|---|------------|
| Patient's Sex | 0010 0040 |
| Number of Study Related Series | 0020 1206 |
| Number of Study Related Instances | 0020 1208 |
| Series Level | |
| Modality | 0008 0060 |
| Series Number | 0020 0011 |
| Series Instance UID | 0020 000D |
| Number of Series Related Instances | 0020 1209 |
| Request Attribute Sequence | 0040 0275 |
| >Requested Procedure ID | 0040 1001 |
| >Scheduled Procedure Step ID | 0040 0009 |
| Performed Procedure Step Start Date | 0040 02444 |
| Performed Procedure Step Start Time | 0040 0245 |
| Composite Object Instance Level | |
| Image Number | 0020 0013 |
| SOP Instance UID | 0008 0018 |
| SOP Class UID | 0008 0016 |
| SR Specific Attributes | |
| Completion Flag | 0040 A491 |
| Verification Flag | 0040 A493 |
| Content Date | 0008 0023 |
| Content Time | 0008 0033 |
| Observation Date Time | 0040 A032 |
| Verifying Observer Sequence | 0040 A073 |
| > Verifying Organization | 0040 A027 |
| > Verification Date Time | 0040 A030 |
| > Verifying Observer Name | 0040 A075 |
| > Verifying Observer Identification Code Sequence | 0040 A088 |
| Referenced Request Sequence | 0040 A370 |
| > Study Instance UID | 0020 000D |
| > Accession Number | 0008 0050 |
| > Requested Procedure ID | 0040 1000 |
| > Rrequested Procedure Code Sequence | 0032 1064 |
| >> Code Value | 0008 0100 |

| | |
|-----------------------------|-----------|
| >> Coding Scheme Designator | 0008 0102 |
| >> Code Meaning | 0008 0104 |
| Concept Name Code Sequence | 0040 A043 |
| > Code Value | 0008 0100 |
| > Coding Scheme Designator | 0008 0102 |
| > Coding Scheme Version | 0008 0103 |
| > Code Meaning | 0008 0104 |

1.3 Message Values

The expected values in C-Find responses and SR objects retrieved from the Report Repository are taken directly from the SR instances loaded into the Report Repository. We do not further document these. If your responses do not match expected values, the evaluation scripts will print both your response and the expected value.

1.4 Configuration

The Report Repository scripts described below use an ASCII configuration file to identify parameters such as host names and port numbers. The configuration file is named *rptrepos_test.cfg* and is included in the directory *\$MESA_TARGET/ mesa_tests/rad/actors/rpt_repos*. Edit the file and change entries (host name, port number, AE title) which pertain to your system. Your system is identified by entries that begin with TEST.

The file *\$MESA_TARGET/runtime/rpt_repos/ds_dcm.cfg* is used to configure the MESA Report Repository. A workstation server is used as a Report Reader. The configuration file for this server is found in *\$MESA_TARGET/runtime/wkstation/ds_dcm.cfg*. The only parameter users should change is the LOG_LEVEL value. Log levels are defined in section 1.5.

The applications listed in the table below are MESA applications that execute on the MESA test system. Configure your system to recognize these servers; you will be asked to move (C-Move) composite objects to the WORKSTATION1 application.

| Application | AE Title | Host | Port |
|------------------------------|----------------|------------------|------|
| MESA Report Repository | REPORT_ARCHIVE | MESA test system | 2800 |
| MESA Report Reader | WORKSTATION1 | MESA test system | 3001 |
| MESA Audit Record Repository | | MESA test system | 4000 |

Read the *Runtime Notes* section of the *Installation Guide* to determine the proper settings for the MESA runtime environment.

1.5 Starting the MESA Servers

These instructions assume you are using a terminal emulator on Unix systems or an MS DOS command window under Windows NT. Each test uses a command line interface; there is no graphical user interface. Before you start the test procedure, you need to start the MESA Report Repository and MESA Report Reader. Make sure the appropriate database is running (PostgreSQL, SQL Server). To start the MESA servers:

1. Enter the Report Repository exam folder: `mesa_tests/rad/actors/rpt_repos`
2. Execute the appropriate script to start the servers:

```
scripts/start_mesa_servers.csh (Unix)
```

```
scripts\start_mesa_servers.bat (Windows)
```

When you are finished running one or more tests, you can stop the servers:

```
scripts/stop_mesa_servers.csh (Unix)
```

```
scripts\stop_mesa_servers.bat (Windows)
```

Log files are stored in `$MESA_TARGET/logs`.

For the security tests, the MESA servers are started with different scripts. These are *scripts/start_mesa_secure.csh* and *scripts\start_mesa_secure.bat*. The log levels are the same as for the standard tests. The MESA servers are stopped using these scripts: *scripts/stop_mesa_secure.csh* and *scripts\stop_mesa_secure.bat*.

1.6 Loading Test Data

All tests will use a common set of test data. These should be loaded one time before any tests are run. You need to start the MESA servers first as described in section 1.5. The MESA Report Repository receives a copy of the test data.

You should clear your Report Repository of all data before loading the test data. Use this command to load the test SR objects into your Report Repository:

```
perl 80x/load_80x.pl
```

2 Individual Tests

2.1 Report Repository Test 801: Modalities In Study

The DICOM attribute 0008 0061 is named “Modalities in Study”. The 801 series tests will send four Study Level queries to the Report Repository and query on this attribute. The table below lists the four queries (a-d) and the values used for matching key. For the a query, the attribute 0008 0061 is sent as zero length, so this becomes a return key.

| Query | Value for Attribute 0008 0061 |
|-------|-------------------------------|
| a | "" |
| b | “SR” |
| c | “CT” |
| d | “SR\CT” |

The d query is actually an illegal query and is included for your own testing. We do not evaluate the results of your response.

1. Start the MESA servers as described in section 1.5. If you have not already loaded the test data into your system, do so as described in section 1.6.
2. Run the script which sends four queries to your Report Repository. This script sends the same queries to the MESA Report Repository so that we can compare results.

```
perl 801/801_rptrepos.pl
```

3. Evaluate the response of your system to queries a, b, and c:

```
perl 801/eval_801.pl
```

2.2 Report Repository Test 802: Related Series/SOP Instances

These tests query Report Repositories for DICOM attributes Number of Study Related Series, Number of Study Related SOP Instances, and Number of Series Related SOP Instances.

1. Start the MESA servers as described in section 1.5. If you have not already loaded the test data into your system, do so as described in section 1.6.
2. Run the script which sends two queries to your Report Repository. This script sends the same queries to the MESA Report Repository so that we can compare results.

```
perl 802/802_rptrepos.pl
```

3. Evaluate the response of your system to queries 802a and 802b:

```
perl 802/eval_802.pl
```

2.3 Report Repository Test 803: Other Report Repository Attributes

This test is not defined for IHE Year 4.

2.4 Report Repository Test 804: Report Specific Queries

This test queries for attributes at the SOP Instance level and compares the results to values stored in the MESA system. The table below lists the attributes requested in the queries.

| | |
|-----------|-------------------|
| 0040 A491 | Completion Flag |
| 0040 A493 | Verification Flag |

1. Start the MESA servers as described in section 1.5. If you have not already loaded the test data into your system, do so as described in section 1.6.

2. Run the script to retrieve a report from the Report Repository:

```
perl 804/804_rptrepos.pl
```

3. Evaluate the SR object retrieved from the Report Repository

```
perl 804/eval_804.pl
```

2.5 Report Repository Test 811: SR Retrieve

These tests retrieve SR objects from the Report Repository and compare them to the original data. The MESA tools will issue a C-Move request with a Destination AE Title of WORKSTATION1. That refers to a server on the MESA system listening for DICOM Associations at port 3001.

4. Start the MESA servers as described in section 1.5. If you have not already loaded the test data into your system, do so as described in section 1.6.

5. Run the script to retrieve a report from the Report Repository:

```
perl 811/811_rptrepos.pl
```

6. Evaluate the SR object retrieved from the Report Repository

```
perl 811/eval_811.pl
```

3 Basic Security Tests

This section describes tests that are specific to the IHE Basic Security integration profile. If you have the MESA servers running for the “standard” tests, you should stop those servers now. You will need to start the MESA secure servers with a different script.

3.1 Report Repository Test 1511: Simple Imaging Report

Report Repository test 1511 uses a combination of events from other tests under the Basic Security integration profile. The Report Repository is expected to communicate with other systems using TLS negotiation and to send appropriate audit messages to the MESA syslog server.

The table below lists the Audit Messages that should be generated by your Report Repository. Please refer to the document *IHE Tests: Transaction Sequences* for the full context of these messages. You might trigger other messages to the Audit Record Repository based on your interaction with your Report Repository.

| Identifier | Description | Source | Destination |
|------------|-----------------------|-------------------|--------------------|
| 1511.016 | DICOMQuery | Report Repository | Audit Record Repos |
| 1511.020 | BeginStoringInstances | Report Repository | Audit Record Repos |
| 1511.022 | InstancesSent | Report Repository | Audit Record Repos |

1. Start the secure MESA servers as described in section 1.5. Load the test data into your system as follows:

```
perl 15xx/load_15xx.pl
```

2. Run the script to send queries to the Report Repository in the secure mode:

```
perl 1511/1511_rptrepos.pl
```

3. Evaluate the SR object retrieved from the Report Repository

```
perl 804/eval_1511.pl
```

4. Grab all of the files (tar/zip) in *\$MESA_TARGET/logs/syslog* and send these to the Project Manager.
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