



Radiology Module with DCM4CHEE

Install Guide

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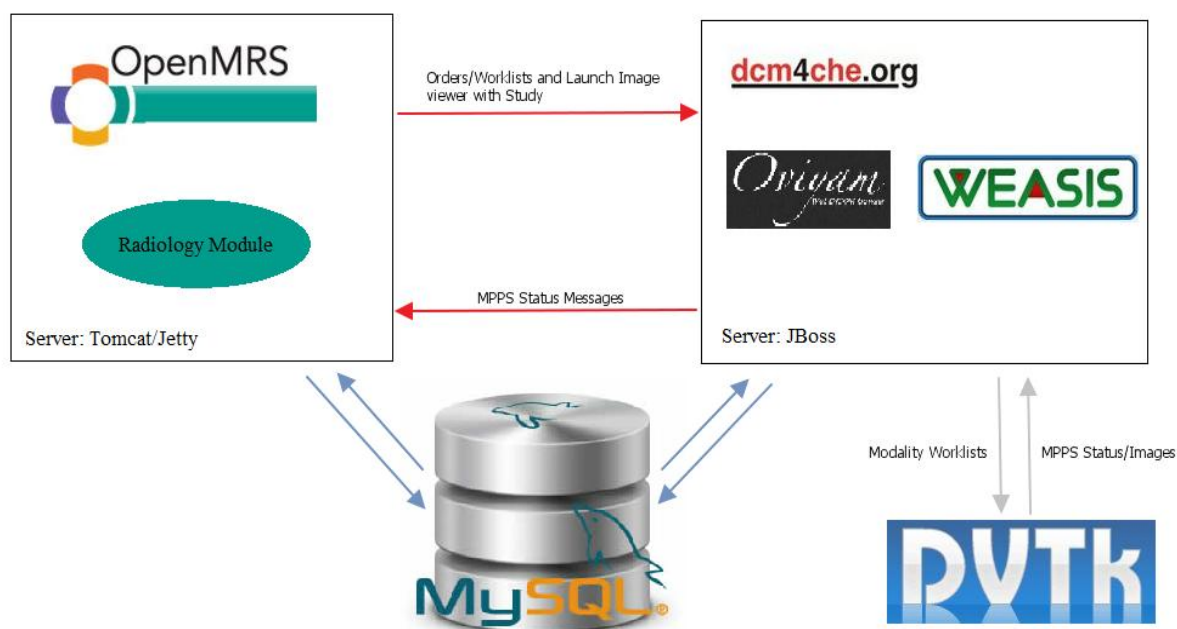
Table of Contents

INTRODUCTION	3
OPENMRS RADIOLOGY MODULE	4
INSTALLATION	4
MODULE PROPERTIES/SETTINGS.....	7
USER PRIVILEGES	9
OPENMRS INSTALLATION NOTES/TIPS.....	12
DCM4CHEE.....	14
INSTALLATION	14
SETTING UP MPPS FORWARDING	19
ADDING RADIOLOGY MODULE AET TO DCM4CHEE	22
NOTES ABOUT DCM4CHEE.....	24
OVIYAM	27
INSTALLATION	27
SERVER CONFIGURATION	27
OVIYAM NOTES	30
WEASIS	30
INSTALLATION	30
MODALITY CONFIGURATION	32
DVTK MODALITY EMULATOR.....	33
INSTALLATION	33
CONFIGURE THE EMULATOR	34

Introduction

This install guide consists of four essential components for the entire module to function properly.


- OpenMRS Radiology Module – Module to place orders/worklists in dcm4chee and reflect the status of the order. Physicians can add radiology orders and specialists can add observations based on the procedure performed. Orders added are stored as modality worklists in dcm4chee.
- DCM4CHEE - A DICOM image and archive manager which can be used as a PACS(Picture Archiving and Communication System) when coupled with a viewer. Also provides features to add modality worklists and update the status of the worklists based on the MPPS(Modality Performed Procedure Step) status messages and forward the status messages to OpenMRS.
- Oviyam/Weasis – DICOM Image Viewer. Oviyam 2.0 is a HTML5 Javascript based DICOM image viewer whereas Weasis is a standalone Java based DICOM image viewer.
- Dvtk Modality Emulator – Emulator to simulate modality functions based on the DICOM standard. Communicates with dcm4chee to retrieve worklists, inform dcm4chee of the status of an initiated procedure and store the images when procedure is completed.



OpenMRS Radiology Module

Installation

- Install the Radiology Module OMOD
 - Download : <https://github.com/akhilrv/Radiology>
 - In “{module folder}/omod/target” : The latest omod will be available.
 - To build again from source, run “mvn clean install” inside the module root folder.
- In the Administration Page,
 - There will be a new section called Radiology Module.
 - Manage Radiology Orders :
 - Referring Physicians can
 - Add orders.
 - View all Radiology orders in the system.
 - Edit orders.
 - Schedulers can schedule the appropriate time for the study (exam) to be performed.
 - Performing Technicians can view orders and update current status of the radiology order.
 - Reading Physicians can
 - View Completed orders with links to launch image viewer.
 - Add observation on the radiology study performed.
 - Configuration and Initialization(Optional: Need not be used if the module started correctly)
 - If module started correctly, a new Order Type called ‘Radiology’ can be found in Administration→Orders→Manage Order Types
 - If module started correctly, new Roles called ‘Scheduler’, ‘Performing Technician’, ‘Reading Physician’, ‘Referring Physician’ can be found in Administration→Users→Manage Roles
 - If not, Click on the “Create Radiology Order Type and Roles required by the module” link.
 - If new user needs to be created, click on the “Create Dummy Users” link.



OpenMRS

Currently logged in as Super User | [Log out](#) | [My Profile](#) | [Help](#)

Home

You have gone full screen. [Exit full screen \(F11\)](#)

Administration

Administration

Users

- [Manage Users](#)
- [Manage Roles](#)
- [Manage Privileges](#)
- [Manage Alerts](#)

Patients

- [Manage Patients](#)
- [Manage Tribes](#)
- [Find Patients to Merge](#)
- [Manage Identifier Types](#)

Person

- [Manage Persons](#)
- [Manage Relationship Types](#)
- [Manage Person Attribute Types](#)

Visits

- [Manage Visit Types](#)
- [Manage Visit Attribute Types](#)
- [Configure Visits](#)

Encounters

- [Manage Encounters](#)
- [Manage Encounter Types](#)
- [Manage Encounter Roles](#)

Providers

- [Manage Providers](#)
- [Manage Provider Attribute Types](#)

Locations

- [Manage Locations](#)
- [Manage Location Tags](#)
- [View Location Hierarchy](#)
- [Manage Location Attribute Types](#)
- [Manage Layout](#)

Observations

- [Manage Observations](#)

Orders

- [Manage Orders](#)

Concepts

- [View Concept Dictionary](#)
- [Manage Concept Drugs](#)
- [Manage Proposed Concepts](#)
- [Update Concept Index](#)
- [Manage Concept Classes](#)
- [Manage Concept Datatypes](#)
- [Manage Concept Sources](#)
- [Manage Concept Stop Word](#)
- [Manage Reference Terms](#)

Forms

- [Manage Forms](#)
- [Manage Fields](#)
- [Manage Field Types](#)
- [Merge Duplicate Fields](#)

HL7 Messages

- [Manage HL7 Sources](#)
- [Manage Queued Messages](#)
- [Manage Held Messages](#)
- [Manage HL7 Errors](#)
- [Manage HL7 Archives](#)
- [Migrate HL7 Archives](#)

Maintenance

- [Set Implementation Id](#)
- [System Information](#)
- [Audit Patient Identifiers](#)
- [View Quick Reports](#)
- [Settings](#)
- [Advanced Settings](#)
- [View Server Log](#)
- [View Database Changes](#)
- [Manage Locales And Themes](#)
- [View Logged In Users](#)

Modules

- [Manage Modules](#)
- [Module Properties](#)

Logic Module

- [Token Registration](#)
- [Rule Definitions](#)
- [Test Logic Expressions](#)
- [Initial Set-Up](#)

HTML Form Entry

- [Manage HTML Forms](#)
- [Preview HTML Form from File](#)

REST Web Services


- [Settings](#)
- [Test](#)
- [Help](#)

Basic Module

- [basicmodule.replace.this.link.name](#)

Radiology Module

- [Configuration and initialization](#)
- [Manage Radiology Orders](#)



OpenMRS

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Home

You have gone full screen. [Exit full screen \(F11\)](#)

Administration

[Admin](#) | [Manage Radiology Orders](#)

Configuration and initialization

Create radiology order type and roles required by the module (Optional)

Create dummy users (Optional)

Saving :

MWL entries in: C:\OpenMRS1.9.x\openmrs-core\webapp\mw\

MPPS entries in: C:\OpenMRS1.9.x\openmrs-core\webapp\mpp\

OpenMRS Radiology Module

The screenshot shows the OpenMRS Admin interface. The browser address bar displays `localhost:8080/openmrs/admin/orders/orderType.list`. The top navigation bar includes links for Home, Find/Create Patient, Dictionary, and Administration. The user is logged in as Super User. The breadcrumb trail is Admin > Manage Orders > Manage Drug Orders > **Manage Order Types**. The main heading is Order Type Management, with a link to Add Order Type. Below this is a section titled Current Order Types, which contains a table with columns Name and Description. The table lists three order types: Drug_order (Order of medications for the patient), Lab_test (An order by a clinician for a laboratory test), and Radiology (Order for radiology procedures). The Radiology row is highlighted with a red box. A button labeled Delete Selected Order Types is located below the table. At the bottom of the page, there is a footer with language options (English (United States), English (United Kingdom)), build information (Last Build: Nov 26 2013 03:56 PM, Version: 1.9.1 Build 28992), and a note that the system is Powered by OpenMRS.

OpenMRS

Home | Find/Create Patient | Dictionary | Administration

Admin | Manage Orders | Manage Drug Orders | **Manage Order Types**

Order Type Management

[Add Order Type](#)

Current Order Types

Name	Description
Drug_order	Order of medications for the patient
Lab_test	An order by a clinician for a laboratory test
Lunch_order so hungry	
Radiology	Order for radiology procedures

[Delete Selected Order Types](#)

English (United States) | English (United Kingdom) | Last Build: Nov 26 2013 03:56 PM | Version: 1.9.1 Build 28992 | Powered by OpenMRS

The screenshot shows the OpenMRS Admin interface. The browser address bar displays `localhost:8080/openmrs/admin/users/role.list`. The top navigation bar includes links for Home, Find/Create Patient, Dictionary, and Administration. The user is logged in as Super User. The breadcrumb trail is Admin > Manage Users > **Manage Roles** > Manage Privileges > Manage Alerts. The main heading is Role Management, with a link to Add Role. Below this is a section titled Current Roles, which contains a table with columns Role, Description, Inherited Roles, and Privileges. The table lists several roles: Anonymous (Privileges for non-authenticated users), Authenticated (Privileges gained once authentication has been established), Provider (All users with the 'Provider' role will appear as options in the default Infopath), Radiology: Performing Technician (Radiology: Performing Technician), Radiology: Reading physician (Radiology: Reading physician), Radiology: Referring physician (Radiology: Referring physician), Radiology: Scheduler (Radiology: Scheduler), Scheduler (Scheduler), and System Developer (Developers of the OpenMRS .. have additional access to change fundamental structure of the database model). The Radiology: Performing Technician, Radiology: Reading physician, Radiology: Referring physician, and Radiology: Scheduler rows are highlighted with a red box. A button labeled Delete Selected Roles is located below the table. At the bottom of the page, there is a footer with language options (English (United States), English (United Kingdom)), build information (Last Build: Nov 26 2013 03:56 PM, Version: 1.9.1 Build 28992), and a note that the system is Powered by OpenMRS.

OpenMRS - Role Manager

Home | Find/Create Patient | Dictionary | Administration

Admin | Manage Users | **Manage Roles** | Manage Privileges | Manage Alerts

Role Management

[Add Role](#)

Current Roles

Role	Description	Inherited Roles	Privileges
Anonymous	Privileges for non-authenticated users.		View Navigation Menu
Authenticated	Privileges gained once authentication has been established.		View Relationships , View Privileges ...
Provider	All users with the 'Provider' role will appear as options in the default Infopath		Patient Dashboard - View Encounters Section , View Users ...
Radiology: Performing Technician	Radiology: Performing Technician	Provider	
Radiology: Reading physician	Radiology: Reading physician	Provider	
Radiology: Referring physician	Radiology: Referring physician	Provider	
Radiology: Scheduler	Radiology: Scheduler	Provider	
Scheduler	Scheduler	System Developer	
System Developer	Developers of the OpenMRS .. have additional access to change fundamental structure of the database model.	[Has all roles and privileges]	

[Delete Selected Roles](#)

English (United States) | English (United Kingdom) | Last Build: Nov 26 2013 03:56 PM | Version: 1.9.1 Build 28992 | Powered by OpenMRS

Module Properties/Settings

- Goto Administration→Maintenance→Settings→Radiology
 - **Application Entity Title** is the application entity title of the radiology module which is used by dcm4chee to forward status updates of various studies (radiology orders). This has to be identical to the Application Entities mentioned in the Application Entities Console of the dcm4chee Web Application. It should also be the Application Entity mentioned in the forwarding rules of the MPPSScu service in the JMX-Console.
 - **Called Application Entity Title** is the application entity title of dcm4chee which is used for communication which is DCM4CHEE by default.
 - **Mwl MPPS Port** is the port the Radiology Module is listening to for status updates from dcm4chee.
 - **Oviyam Local Server Name** is the 'Server Description' of the dcm4chee server in Oviyam's settings. This has to be identical to the entry in the oviyam settings as its used to build the URL to view the image.
 - **Servers Address** is the ip address of the dcm4chee server. 'localhost' is the default value.
 - **Servers Port** is the port in which the web application of dcm4chee is accessed. This is the port through which images is accessed.
 - **Viewer URL Path** is the designated path for DICOM image viewer. Default set for Oviyam 2.0 but can be configured to Weasis as well.
- **If any of the settings are changed in Radiology Settings, the module needs to be restarted for the new settings to take effect.**

Users

- [Manage Users](#)
- [Manage Roles](#)
- [Manage Privileges](#)
- [Manage Alerts](#)

Patients

- [Manage Patients](#)
- [Manage Tribes](#)
- [Find Patients to Merge](#)
- [Manage Identifier Types](#)

Person

- [Manage Persons](#)
- [Manage Relationship Types](#)
- [Manage Person Attribute Types](#)

Visits

- [Manage Visit Types](#)
- [Manage Visit Attribute Types](#)
- [Configure Visits](#)

Encounters

- [Manage Encounters](#)
- [Manage Encounter Types](#)
- [Manage Encounter Roles](#)

Providers

- [Manage Providers](#)
- [Manage Provider Attribute Types](#)

Locations

- [Manage Locations](#)
- [Manage Location Tags](#)
- [View Location Hierarchy](#)
- [Manage Location Attribute Types](#)
- [Manage Layout](#)

Observations

- [Manage Observations](#)

Orders

- [Manage Orders](#)
- [Manage Drug Orders](#)
- [Manage Order Types](#)

Scheduler

- [Manage Scheduler](#)

Programs

Concepts

- [View Concepts](#)
- [Manage Concepts](#)
- [Manage Proposed Concepts](#)
- [Update Concept Index](#)
- [Manage Concept Classes](#)
- [Manage Concept Datatypes](#)
- [Manage Concept Sources](#)
- [Manage Concept Stop Word](#)
- [Manage Reference Terms](#)

Forms

- [Manage Forms](#)
- [Manage Fields](#)
- [Manage Field Types](#)
- [Merge Duplicate Fields](#)

HL7 Messages

- [Manage HL7 Sources](#)
- [Manage Queued Messages](#)
- [Manage Held Messages](#)
- [Manage HL7 Errors](#)
- [Manage HL7 Archives](#)
- [Migrate HL7 Archives](#)

Maintenance

- [Set Implementation Id](#)
- [System Information](#)
- [Audit Patient Identifiers](#)
- [View Quick Reports](#)
- [Settings](#)
- [Advanced Settings](#)
- [View Server Log](#)
- [View Database Changes](#)
- [Manage Locales And Themes](#)
- [View Logged In Users](#)

Modules

- [Manage Modules](#)
- [Module Properties](#)

Logic Module

- [Token Registration](#)
- [Rule Definitions](#)
- [Test Logic Expressions](#)
- [Initial Set-Up](#)

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- [Manage HTML Forms](#)
- [Preview HTML Form from File](#)

REST Web Services

- [Settings](#)
- [Test](#)
- [Help](#)

Basic Module

- [basicmodule.replace.this.link.name](#)

Radiology Module

- [Configuration and initialization](#)
- [Manage Radiology Orders](#)

[Admin](#) | [Set Implementation Id](#) | [System Information](#) | [Audit Patient Identifiers](#) | [View Quick Reports](#) | [Settings](#) | [Advanced Settings](#) | [View Server Log](#) | [View Database Changes](#) | [Manage Locales And Themes](#) | [View Logged In Users](#)

Settings

[General Settings](#)
[Application](#)
[Auto Close Visits](#)
[Basicmodule](#)
[Concept](#)
[Concept Drug](#)
[Concept Map Type Management](#)
[Concepts](#)
[Dashboard](#)
[Encounter Form](#)
[Form Entry](#)
[Formentry](#)
[Graph](#)
[Gzip](#)
[HL 7 Archive](#)
[HL 7 Processor](#)
[Htmlformentry](#)
[Layout](#)
[Locale](#)
[Location](#)
[Log](#)
[Logic](#)
[Mail](#)
[New Patient Form](#)
[Obs](#)
[Patient](#)
[Patient Identifier](#)
[Patient Search](#)
[Person](#)
[Radiology](#)
[Report](#)
[Report Problem](#)
[Reporting](#)
[Reportingcompatibility](#)
[Scheduler](#)
[Search Widget](#)
[Security](#)
[Serialization](#)
[Use Patient Attribute](#)
[User](#)
[Visits](#)
[Webservices](#)
[Xforms](#)

Application Entity Title Title for this application entity	<input type="text" value="RADIOLOGY_MODULE"/>
Application UID You need a application root UID, this will be the prefix of any module DICOM object, the default value serves for debugging purposes	<input type="text" value="1.2.826.0.1.3680043.8.2186"/>
Called Application Entity Title Default application entity for DCM4CHEE. Called Application Entity with respect to OpenMRS	<input type="text" value="DCM4CHEE"/>
Dev Mode On/Off. On to: 1. Set Provider or System developer (if provider does not have privileges) privileges to the roles created by the module	<input type="text" value="On"/>
Mpps Directory Directory for mpps entries	<input type="text" value="mpps"/>
Mwl Directory Directory for mwl entries. Ex: d:/tmp/mwl or /tmp/mwl	<input type="text" value="mwl"/>
Mwl Mpps Port Port of the DICOM MWL and MPPS server	<input type="text" value="11114"/>
Oviyam Local Server Name Local Server name needed for deploying Oviyam. Must match the local server name created in the Oviyam UI.	<input type="text" value="oviyamlocal"/>
Servers Address IP address of the 2 DICOM servers	<input type="text" value="localhost"/>
Servers Port Port of the dcm4chee Web	<input type="text" value="8081"/>
Specific Character Set DICOM working character set	<input type="text" value="ISO-8859-1"/>
Storage Commitment Port Storage Commitment port that modality uses to confirm a storage of an image	<input type="text" value="11115"/>
Storage Directory Directory for DICOM objects	<input type="text" value="storage"/>
Storage Port Port of the DICOM storage server.	<input type="text" value="11116"/>
Study UID Slug Example: applicationUID+studyUIDSlug+orderId could be a study UID. The default value works!. Example values: 1.2, 1.1.1 (No start or end dots)	<input type="text" value="1"/>
Viewer URL Path URL for Oviyam/Weasis. Default for value Oviyam. For Weasis(needs Java Web Start) : */weasis-pacs-connector/viewer.jsp?*	<input type="text" value="/oviyam2/viewer.html?"/>
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

User Privileges

- The new roles added to the system inherit properties from the default role 'Provider' as well as their privileges.
- The privileges needed by users/roles using the module are :
 - Add,Edit,Delete,View Orders.
 - Add,Edit,Delete,View Observations.
 - Patient Dashboard – View Radiology Section.
 - View Users.
 - View Encounters.
 - View Concepts.
 - View Patients.
 - View Administration Functions.

The screenshot displays the OpenMRS web application interface. At the top, the OpenMRS logo is on the left, and the user is logged in as 'Super User' with links for 'Log out', 'My Profile', and 'Help'. A navigation bar contains links for 'Home', 'Find/Create Patient', 'Dictionary', and 'Administration'. Below this, a breadcrumb trail shows 'Admin' > 'Manage Users' > 'Manage Roles' > 'Manage Privileges' > 'Manage Alerts'.

The main section is titled 'Role Management'. It shows the 'Provider' role with a description: 'All users with the 'Provider' role will appear as options in the default Infopath'. Below this, it lists roles that inherit privileges from 'Provider': 'Radiology: Performing Technician', 'Radiology: Reading physician', 'Radiology: Scheduler', and 'Radiology: Referring physician'.

The 'Inherited Roles' section shows a list of roles that the 'Provider' role inherits privileges from: 'Radiology: Performing Technician', 'Radiology: Reading physician', 'Radiology: Referring physician', 'Radiology: Scheduler', 'Scheduler', and 'System Developer'.

The 'Privileges' section contains a list of checkboxes for various system functions. A note states: 'Greyed out checkboxes represent privileges inherited from other roles, these cannot be removed individually.' The checkboxes are arranged in two columns:

<input type="checkbox"/> Add Allergies	<input type="checkbox"/> Add Cohorts
<input type="checkbox"/> Add Concept Proposals	<input type="checkbox"/> Add Encounters
<input type="checkbox"/> Add FormEntry Archive	<input type="checkbox"/> Add FormEntry Error
<input type="checkbox"/> Add FormEntry Queue	<input type="checkbox"/> Add HL7 Inbound Archive
<input type="checkbox"/> Add HL7 Inbound Exception	<input type="checkbox"/> Add HL7 Inbound Queue
<input type="checkbox"/> Add HL7 Source	<input checked="" type="checkbox"/> Add Observations
<input checked="" type="checkbox"/> Add Orders	<input type="checkbox"/> Add Patient Identifiers
<input type="checkbox"/> Add Patient Programs	<input type="checkbox"/> Add Patients
<input type="checkbox"/> Add People	<input type="checkbox"/> Add Problems
<input type="checkbox"/> Add Relationships	<input type="checkbox"/> Add Report Objects
<input type="checkbox"/> Add Reports	<input type="checkbox"/> Add Users
<input type="checkbox"/> Add Visits	<input type="checkbox"/> Configure Visits
<input type="checkbox"/> Delete Cohorts	<input type="checkbox"/> Delete Concept Proposals
<input type="checkbox"/> Delete Encounters	<input type="checkbox"/> Delete FormEntry Archive

OpenMRS Radiology Module

<input type="checkbox"/> Delete Concepts	<input type="checkbox"/> Delete Concept Proposals
<input type="checkbox"/> Delete Encounters	<input type="checkbox"/> Delete FormEntry Archive
<input type="checkbox"/> Delete FormEntry Error	<input type="checkbox"/> Delete FormEntry Queue
<input type="checkbox"/> Delete HL7 Inbound Archive	<input type="checkbox"/> Delete HL7 Inbound Exception
<input type="checkbox"/> Delete HL7 Inbound Queue	<input type="checkbox"/> Delete Observations
<input checked="" type="checkbox"/> Delete Orders	<input type="checkbox"/> Delete Patient Identifiers
<input type="checkbox"/> Delete Patient Programs	<input type="checkbox"/> Delete Patients
<input type="checkbox"/> Delete People	<input type="checkbox"/> Delete Relationships
<input type="checkbox"/> Delete Report Objects	<input type="checkbox"/> Delete Reports
<input type="checkbox"/> Delete Users	<input type="checkbox"/> Delete Visits
<input type="checkbox"/> Edit Allergies	<input type="checkbox"/> Edit Cohorts
<input type="checkbox"/> Edit Concept Proposals	<input type="checkbox"/> Edit Encounters
<input type="checkbox"/> Edit FormEntry Archive	<input type="checkbox"/> Edit FormEntry Error
<input type="checkbox"/> Edit FormEntry Queue	<input checked="" type="checkbox"/> Edit Observations
<input checked="" type="checkbox"/> Edit Orders	<input type="checkbox"/> Edit Patient Identifiers
<input type="checkbox"/> Edit Patient Programs	<input type="checkbox"/> Edit Patients
<input type="checkbox"/> Edit People	<input type="checkbox"/> Edit Problems
<input type="checkbox"/> Edit Relationships	<input type="checkbox"/> Edit Report Objects
<input type="checkbox"/> Edit Reports	<input type="checkbox"/> Edit User Passwords
<input type="checkbox"/> Edit Users	<input type="checkbox"/> Edit Visits
<input type="checkbox"/> Form Entry	<input type="checkbox"/> Manage Address Templates
<input type="checkbox"/> Manage Alerts	<input type="checkbox"/> Manage Cohort Definitions
<input type="checkbox"/> Manage Concept Classes	<input type="checkbox"/> Manage Concept Datatypes
<input type="checkbox"/> Manage Concept Map Types	<input type="checkbox"/> Manage Concept Name tags
<input type="checkbox"/> Manage Concept Reference Terms	<input type="checkbox"/> Manage Concept Sources
	<input type="checkbox"/> Manage Concept Stop Words
<input type="checkbox"/> Manage Concepts	<input type="checkbox"/> Manage Data Set Definitions
<input type="checkbox"/> Manage Dimension Definitions	<input type="checkbox"/> Manage Encounter Roles
<input type="checkbox"/> Manage Field Types	<input type="checkbox"/> Manage Encounter Types
<input type="checkbox"/> Manage Forms	<input type="checkbox"/> Manage FormEntry XSN
<input type="checkbox"/> Manage HL7 Messages	<input type="checkbox"/> Manage Global Properties
<input type="checkbox"/> Manage Implementation Id	<input type="checkbox"/> Manage Identifier Types
	<input type="checkbox"/> Manage Indicator

<input type="checkbox"/> Manage Concept Map Types	<input type="checkbox"/> Manage Concept Name tags
<input type="checkbox"/> Manage Concept Reference Terms	<input type="checkbox"/> Manage Concept Sources
	<input type="checkbox"/> Manage Concept Stop Words
<input type="checkbox"/> Manage Concepts	<input type="checkbox"/> Manage Data Set Definitions
<input type="checkbox"/> Manage Dimension Definitions	<input type="checkbox"/> Manage Encounter Roles
<input type="checkbox"/> Manage Field Types	<input type="checkbox"/> Manage Encounter Types
<input type="checkbox"/> Manage Forms	<input type="checkbox"/> Manage FormEntry XSN
<input type="checkbox"/> Manage HL7 Messages	<input type="checkbox"/> Manage Global Properties
<input type="checkbox"/> Manage Implementation Id	<input type="checkbox"/> Manage Identifier Types
	<input type="checkbox"/> Manage Indicator Definitions
<input type="checkbox"/> Manage Location Attribute Types	<input type="checkbox"/> Manage Location Tags
<input type="checkbox"/> Manage Modules	<input type="checkbox"/> Manage Locations
<input type="checkbox"/> Manage Person Attribute Types	<input type="checkbox"/> Manage Order Types
	<input type="checkbox"/> Manage Privileges
<input type="checkbox"/> Manage Providers	<input type="checkbox"/> Manage Programs
<input type="checkbox"/> Manage Relationships	<input type="checkbox"/> Manage Relationship Types
<input type="checkbox"/> Manage Report Designs	<input type="checkbox"/> Manage Report Definitions
<input type="checkbox"/> Manage Roles	<input type="checkbox"/> Manage Reports
<input type="checkbox"/> Manage Scheduler	<input type="checkbox"/> Manage Rule Definitions
<input type="checkbox"/> Manage Visit Attribute Types	<input type="checkbox"/> Manage Tokens
	<input type="checkbox"/> Manage Visit Types
<input checked="" type="checkbox"/> Patient Dashboard - View Encounters Section	<input checked="" type="checkbox"/> Patient Dashboard - View Demographics Section
<input checked="" type="checkbox"/> Patient Dashboard - View Graphs Section	<input checked="" type="checkbox"/> Patient Dashboard - View Forms Section
<input checked="" type="checkbox"/> Patient Dashboard - View Patient Summary	<input checked="" type="checkbox"/> Patient Dashboard - View Overview Section
<input checked="" type="checkbox"/> Patient Dashboard - View Regimen Section	<input checked="" type="checkbox"/> Patient Dashboard - View Radiology Section
<input checked="" type="checkbox"/> Patient Dashboard - View Visits Section	<input checked="" type="checkbox"/> Patient Dashboard - View Visits Section
<input type="checkbox"/> Pharm add prescription	<input type="checkbox"/> Pharm return prescription
<input type="checkbox"/> Pharm view prescription	<input type="checkbox"/> Purge Field Types
<input type="checkbox"/> Remove Allergies	<input type="checkbox"/> Remove Problems



IMPORTANT : Make sure the server has *Ownership and Write Permissions* to write files and folders. The module creates XML entries of each order in DICOM standard and MPPS DICOM files are written to disk when it receives MPPS status messages from DCM4CHEE.

On Linux

#Change ownership and permission for CATALINA_HOME and CATALINA_BASE

```
sudo chgrp -R tomcat6 /etc/tomcat6
```

```
sudo chmod -R g+w /etc/tomcat6
```

```
sudo chgrp -R tomcat6 /var/lib/tomcat6 # CATALINA_BASE
```

```
sudo chmod -R g+w /var/lib/tomcat6
```

On Windows

#User access control may restrict reading and writing of new files by the server

#To get around this, run the server as an administrator by Right Click on Tomcat-->Run as Administrator

#Or Run-->MSCONFIG-->Tools-->Disable UAP-->Launch

OpenMRS Installation Notes/Tips

- OpenMRS Standalone package comes with tomcat and mysql prepackaged.
- If installing Tomcat and MySql manually, these are some notes useful to help setup the environment quickly.

Tomcat Notes

On Linux

#Install via Debian package on Ubuntu

```
sudo apt-get install tomcat6
```

```
sudo apt-get install tomcat6-admin
```

```
#Add users and their roles to tomcat-users.xml
```

```
sudo vi /etc/tomcat/tomcat-users.xml
```

```
<user name="admin" password="admin" roles="tomcat,admin,manager,manager-gui"/>
```

```
#Turn off the Tomcat security flag
```

```
sudo vi /etc/init.d/tomcat6
```

```
TOMCAT6_SECURITY=no ##from yes to no
```

IMPORTANT

```
#Change ownership and permission for CATALINA_HOME and CATALINA_BASE
```

```
sudo chgrp -R tomcat6 /etc/tomcat6
```

```
sudo chmod -R g+w /etc/tomcat6
```

```
sudo chgrp -R tomcat6 /var/lib/tomcat6 # CATALINA_BASE
```

```
sudo chmod -R g+w /var/lib/tomcat6
```

```
#Create and provide appropriate permissions for OpenMRS properties folder in  
CATALINA_HOME
```

```
sudo mkdir /usr/share/tomcat6/.OpenMRS
```

```
sudo chown -R tomcat6:root /usr/share/tomcat6/.OpenMRS
```

```
#Restart the server
```

```
sudo /etc/init.d/tomcat6 restart
```

#Install manually from package

```
#Download the zip archive of Tomcat 6.0.29
```

```
#Unpack the zip file to a suitable location such as /opt on Linux or /Library on Mac OSX
```

```
# Add ownership and provide permissions for appropriate folders
```

```
sudo useradd tomcat6
```

```
cd /opt
```

```
sudo tar zxvf apache-tomcat-6.0.29.tar.gz
```

```
sudo ln -s apache-tomcat-6.0.29 tomcat6
sudo chown tomcat6.tomcat6 apache-tomcat-6.0.29

#Add users and their roles to tomcat-users.xml
sudo vi /etc/tomcat/tomcat-users.xml
<user name="admin" password="admin" roles="tomcat,admin,manager,manager-gui"/>

### Useful Linux commands ###
sudo find / -name . "openmrs-runtime.properties"
netstat -tap
netstat -tln
```

On Windows

#Use the Windows installer to install tomcat
#User access control may restrict reading and writing of new files by the server
#To get around this, run the server as an administrator by Right Click on Tomcat-->Run as Administrator
#Or Run-->MSCONFIG-->Tools-->Disable UAP-->Launch

Deploy OpenMRS

#Add OpenMRS in tomcat manager
<http://localhost:8080/manager/html>
Upload OpenrMRS.war

#Run OpenMRS and upload module
<http://localhost:8080/openmrs/index.htm>

Mysql Notes

On Linux

#Install using debian package
sudo apt-get install mysql-server
#Configure root password

Stop/Start/Restart Mysql
sudo /etc/init.d/mysql start/stop/restart

On Windows

#Use default windows installer and configure root password

DCM4CHEE

Installation

- **Requirements :** A supported database must be installed for dcm4chee. The list of supported databases are,
 - PostgreSQL 8.1+
 - MySQL 4.1+
 - Oracle 9i+
 - SQL Server 2000+
 - DB2 8.1+
 - Firebird 2.1+

Note: This guide is based on MySql 5.5

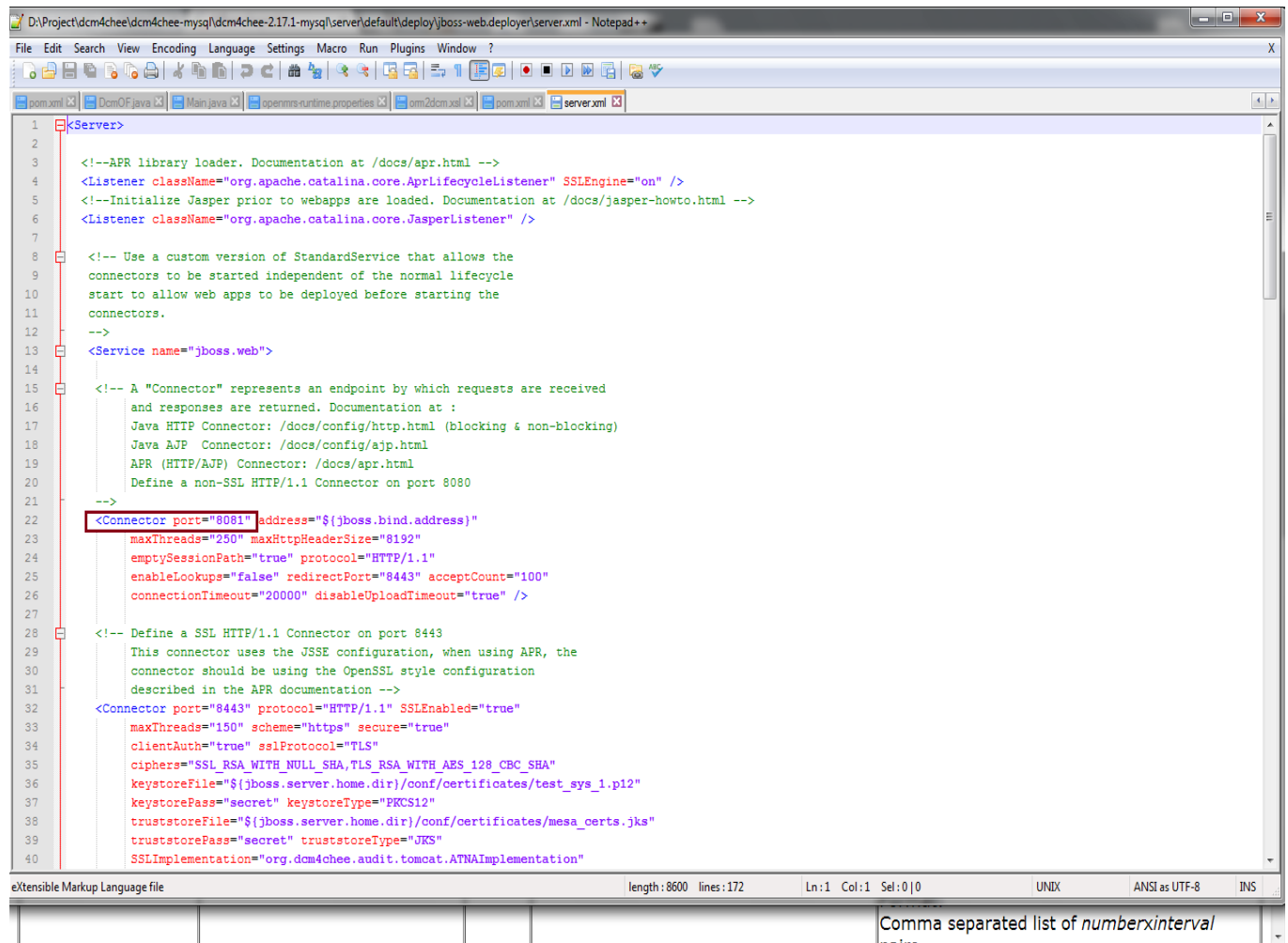
<http://dev.mysql.com/downloads/mysql/>

- For detailed instructions on installing dcm4chee :
<http://www.dcm4che.org/confluence/display/ee2/Installation>
- Download the binary distribution for dcm4chee from sourceforge and extract it : The below link is the binary for MySQL
<http://sourceforge.net/projects/dcm4che/files/dcm4chee/2.17.1/dcm4chee-2.17.1-mysql.zip/download>
- Download the binary distribution package of JBoss Application Server 4.2.3.GA:
<http://www.jboss.org/jbossas/downloads>
- Copy files from JBoss to dcm4chee:
 - Dcm4chee consists of components that run within the JBoss application server platform. This step will copy the JBoss runtime files to the dcm4chee directory.
 - Go to the dcm4chee-2.17.1-xxx/bin directory and execute the install_jboss.bat or install_jboss.sh script, as appropriate for your operating system, with the path of your JBoss as installation directory as a parameter.
 - For example:
 - `C:\apps\dcm4chee-2.17.1-psql\bin>install_jboss.bat`
`c:\apps\jboss-4.2.3.GA`
- **Create the dcm4chee database**
- Create and initialize the dcm4chee database.
- The file `create.mysql` can be found at `<installation folder>/dcm4chee-<x.xx.x>-mysql/sql/create.mysql`, where `<x.xx.x>` is the dcm4chee version number.
- The file `create.mysql` contains SQL instructions that populate the database with empty tables.

```
> mysql -uroot -p<root password>
```

```
mysql> create database pacsdbs;  
mysql> grant all on pacsdbs.* to 'pacs'@'localhost' identified by  
'pacs';  
mysql> \q  
> mysql -upacs -ppacs pacsdbs < create.mysql
```

- Change Port for dcm4chee WebApp (optional)
 - Default port on which dcm4chee webapp is deployed is 8080.
 - To avoid clashes with the OpenMRS server, it is recommended to change the port.
 - Go to {install folder}\dcm4chee-2.17.1-mysql\server\default\deploy\jboss-web.deployer\server.xml
 - Change the connector port tag from port=8080 to a custom port.
 - **Note:** OpenMRS Standalone uses port 8081 by default.
 - **IMPORTANT: The module depends on the port that is set here for viewing images. The value used by the module is 8081 by default. If you choose to use any other free port, remember to change the port in**
OpenMRS→Administration→Settings→Radiology→Servers Port
After saving the change in port value, you will need to restart the module.
(See figures below)



```

1 <Server>
2
3 <!--APR library loader. Documentation at /docs/apr.html -->
4 <Listener className="org.apache.catalina.core.AprLifecycleListener" SSLEngine="on" />
5 <!--Initialize Jasper prior to webapps are loaded. Documentation at /docs/jasper-howto.html -->
6 <Listener className="org.apache.catalina.core.JasperListener" />
7
8 <!-- Use a custom version of StandardService that allows the
9 connectors to be started independent of the normal lifecycle
10 start to allow web apps to be deployed before starting the
11 connectors.
12 -->
13 <Service name="jboss.web">
14
15 <!-- A "Connector" represents an endpoint by which requests are received
16 and responses are returned. Documentation at :
17 Java HTTP Connector: /docs/config/http.html (blocking & non-blocking)
18 Java AJP Connector: /docs/config/ajp.html
19 APR (HTTP/AJP) Connector: /docs/apr.html
20 Define a non-SSL HTTP/1.1 Connector on port 8080
21 -->
22 <Connector port="8081" address="{jboss.bind.address}"
23     maxThreads="250" maxHttpHeaderSize="8192"
24     emptySessionPath="true" protocol="HTTP/1.1"
25     enableLookups="false" redirectPort="8443" acceptCount="100"
26     connectionTimeout="20000" disableUploadTimeout="true" />
27
28 <!-- Define a SSL HTTP/1.1 Connector on port 8443
29 This connector uses the JSSE configuration, when using APR, the
30 connector should be using the OpenSSL style configuration
31 described in the APR documentation -->
32 <Connector port="8443" protocol="HTTP/1.1" SSLEnabled="true"
33     maxThreads="150" scheme="https" secure="true"
34     clientAuth="true" sslProtocol="TLS"
35     ciphers="SSL_RSA_WITH_NULL_SHA,TLS_RSA_WITH_AES_128_CBC_SHA"
36     keystoreFile="{jboss.server.home.dir}/conf/certificates/test_sys_1.p12"
37     keystorePass="secret" keystoreType="PKCS12"
38     truststoreFile="{jboss.server.home.dir}/conf/certificates/mesa_certs.jks"
39     truststorePass="secret" truststoreType="JKS"
40     SSLImplementation="org.dcm4chee.audit.tomcat.ATNImplementation"

```

length: 8600 lines: 172 Ln: 1 Col: 1 Sel: 0 | 0 UNDX ANSI as UTF-8 INS

Comma separated list of *numberinterval* pairs

localhost:8080/openmrs/admin/maintenance/settings.list?show=Radiology

Basicmodule
Concept
Concept Drug
Concept Map Type Management
Concepts
Dashboard
Encounter Form
Form Entry
Formentry
Graph
Gzip
HL 7 Archive
HL 7 Processor
Htmlformentry
Layout
Locale
Location
Log
Logic
Mail
New Patient Form
Obs
Patient
Patient Identifier
Patient Search
Person
Radiology
Report
Report Problem
Reporting
Reportingcompatibility
Scheduler
Search Widget
Security
Serialization
Use Patient Attribute
User
Visits
Webservices
Xforms

Application UID
You need a application root UID, this will be the prefix of any module DICOM object, the default value serves for debugging purposes
1.2.826.0.1.3680043.8.2186

Called Application Entity Title
Default application entity for DCM4CHEE. Called Application Entity with respect to OpenMRS
DCM4CHEE

Dev Mode
On/Off. On to: 1. Set Provider or System developer (if provider does not have privileges) privileges to the roles created by the module
On

Mpps Directory
Directory for mpps entries
mpps

Mwl Directory
Directory for mwl entries. Ex: d:/tmp/mwl or /tmp/mwl
mwl

Mwl Mpps Port
Port of the DICOM MWL and MPPS server
11114

Oviyam Local Server Name
Local Server name needed for deploying Oviyam. Must match the local server name created in the Oviyam UI
oviyamlocal

Servers Address
IP address of the 2 DICOM servers
localhost

Servers Port
Port of the dcm4chee Web
8081

Specific Character Set
DICOM working character set
ISO-8859-1

Storage Commitment Port
Storage Commitment port that modality uses to confirm a storage of an image
11115

Storage Directory
Directory for DICOM objects
storage

Storage Port
Port of the DICOM storage server.
11116

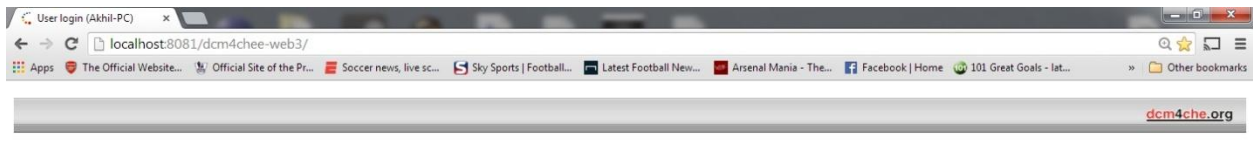
Study UID Slug
Example: applicationUID+studyUIDSlug+orderid could be a study UID. The default value works!.
Example values: 1.2, 1.1.1 (No start or end dots)
1

Viewer URL Path
URL for Oviyam/Weasis. Default for value Oviyam. For Weasis(needs Java Web Start) : "/weasis-pacs-connector/viewer.jsp"
/oviyam2/viewer.html?

Save Cancel

English (United States) | English (United Kingdom) Last Build: Nov 26 2013 03:56 PM Version: 1.9.1 Build 28992 Powered by OpenMRS

- Note : For MAC Users,
 - Because there are no native codecs (compression/decompression) for these platforms, it is necessary to edit configuration to disable the loading of the native codecs. These platforms are not able to take advantage of compression/decompression. The only default loading of the codecs is in the WADO service. You can either edit the property within the JMX Console web user interface, or edit the configuration files directly.
- In {install folder}\dcm4chee-2.17.1-mysql\bin
Execute 'run.bat' to start the server ('run.sh' in Linux)
 (Ctrl-c to shut the server)
- Login to dcm4chee from a browser at <http://localhost:8081/dcm4chee-web3>
- Login credentials User:admin Password:admin



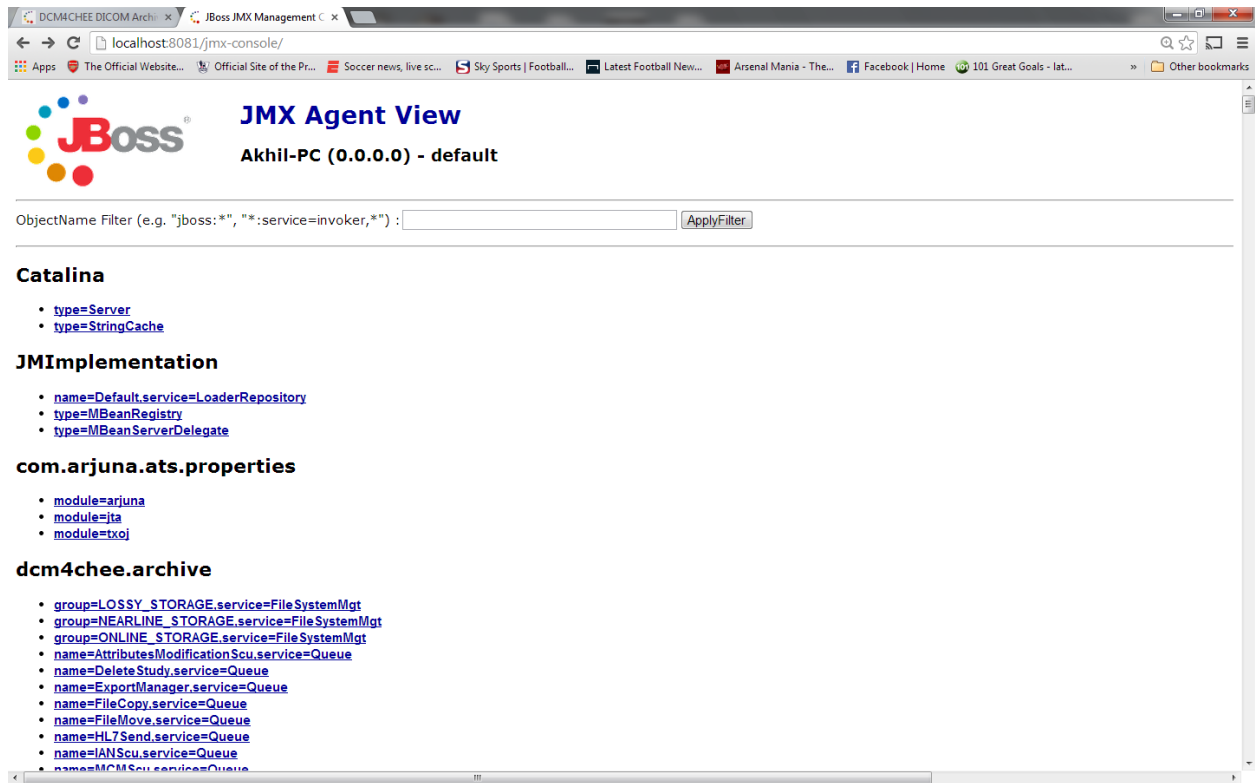
User login at Akhil-PC

Username:

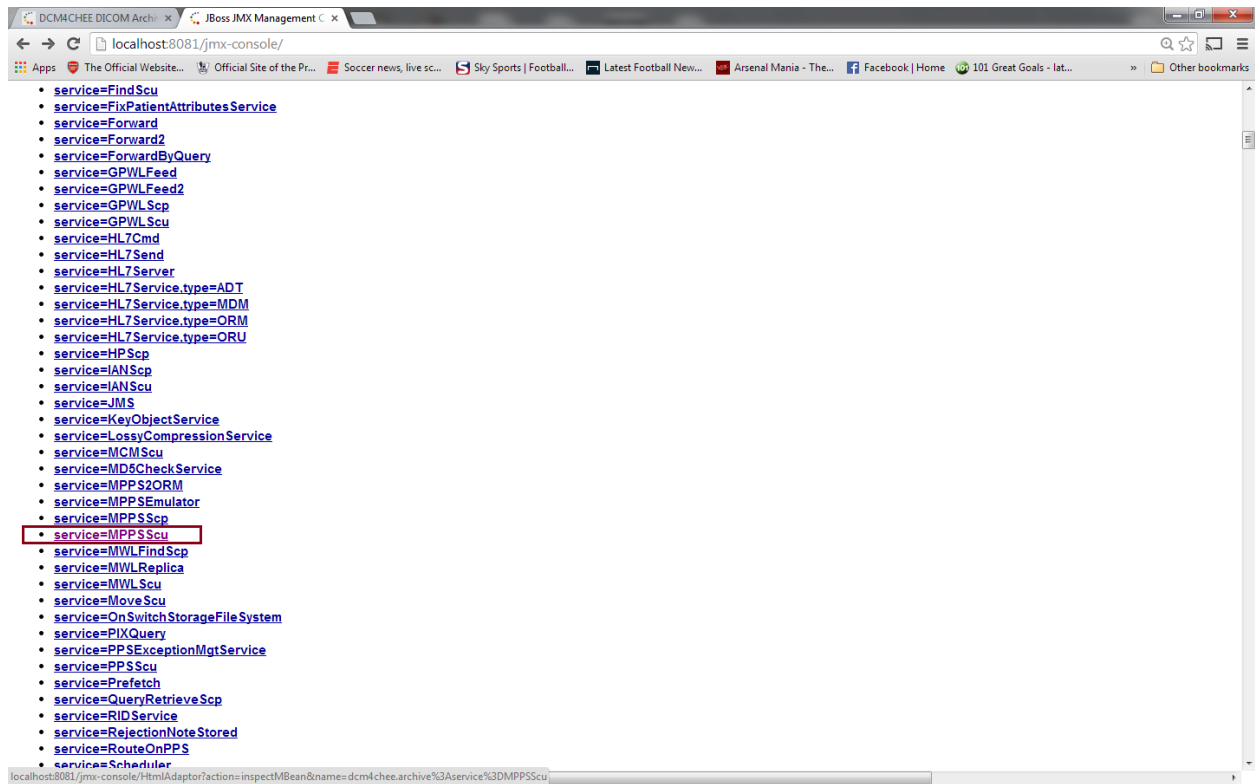
Password:

Setting Up Mpps Forwarding

- In a new tab , open <http://localhost:8081/jmx-console/>



- Search or navigate to 'service=MppsScu' and click on it



- Goto the ForwardingRules section and enter the entry.
[calling!=RADIOLOGY_MODULE]RADIOLOGY_MODULE
And click 'Apply Changes' at the bottom of the table.
- **IMPORTANT** : The 'RADIOLOGY_MODULE' Application Entity title corresponds to the Application Entity title in the module's settings.
- **IMPORTANT**: The 'MWL MPPS Port' corresponds to the port of the 'RADIOLOGY_MODULE' Application Entity in dcm4chee.

OpenMRS Radiology Module

MaximumPDULength	int	RW	16382	length for receiving PDUs.
TcpNoDelay	boolean	RW	<input checked="" type="radio"/> True <input type="radio"/> False	Send packets as quickly as possible (Disable Nagle algorithm).
SendBufferSize	int	RW	0	Buffer size used for socket output. 0 = use platform default.
ReceiveBufferSize	int	RW	0	Buffer size used for socket input. 0 = use platform default.
TLSCfgName	javax.management.ObjectName	RW	dcm4chee.archive.service: View MBean	Used internally. Do NOT modify.
ForwardingRules	java.lang.String	RW	<input type="text" value="[calling!=RADIOLOGY_MODULE]RADIOLOGY_MODULE"/>	<p>List of forwarding rules, dependent upon which application - identified by the Calling AE title - sent the MPPS. The comma separated list of AE titles after the (optional) condition defines the forwarding destination (the other MPPS SCP) by its Called AE Title.</p> <p>Syntax:</p> <pre>rules = (rule { newline rule } 'NONE') (* 'NONE' = no forwarding *) rule = '[' 'calling' '[' ']' '=' from '[']' to from = aet { '[' ']' aet } (* calling AE titles *) to = aet { '[' ']' aet } (* destination AE titles *)</pre> <p>Example:</p> <pre>[calling!=ORDER_FILLER]ORDER_FILLER => Forwards received MPPS to ORDER_FILLER, except MPPS received from ORDER_FILLER</pre>
CallingAETitle	java.lang.String	RW	DCM4CHEE	Calling AE Title used in the Association Request.
Concurrency	int	RW	1	Maximum number of concurrent forwarded MPPS messages.
				Number and intervals of retries for failed MPPS forward requests. Format: Comma separated list of <i>numberinterval</i> pairs.

RetryIntervals	java.lang.String	RW	5x10s,5x1m,12x5m,24x1h	<p>Number and intervals of retries for failed MPPS forward requests.</p> <p>Format:</p> <p>Comma separated list of <i>numberinterval</i> pairs.</p> <p>The interval can be specified in seconds (<i>##s</i>), minutes (<i>##m</i>), hours (<i>##h</i>) or days (<i>##d</i>).</p> <p>Example:</p> <p>5x1m,10x10m means retry a total of 5 times, one minute apart for each retry; then retry a total of 10 times, 10 minutes apart for each retry.</p>
QueueName	java.lang.String	RW	MPPSScu	Used internally. Do NOT modify.
JMSServiceName	javax.management.ObjectName	RW	dcm4chee.archive.service: View MBean	Used internally. Do NOT modify.
MppsScpServiceName	javax.management.ObjectName	RW	dcm4chee.archive.service: View MBean	Used internally. Do not modify.

[Apply Changes](#)

List of MBean operations:

void create()

Standard MBean lifecycle method

[Invoke](#)

void start()

The start lifecycle operation

[Invoke](#)

void stop()

OpenMRS

Currently logged in as Super User | [Log out](#) | [My Profile](#) | [Help](#)

[Home](#) | [Find/Create Patient](#) | [Dictionary](#) | [Administration](#)

[Admin](#) | [Set Implementation Id](#) | [System Information](#) | [Audit Patient Identifiers](#) | [View Quick Reports](#) | [Settings](#) | [Advanced Settings](#) | [View Server Log](#) | [View Database Changes](#) | [Manage Locales And Themes](#) | [View Logged In Users](#)

Settings

[General Settings](#)
[Application](#)
[Auto Close Visits](#)
[Basicmodule](#)
[Concept](#)
[Concept Drug](#)
[Concept Map Type Management](#)
[Concepts](#)
[Dashboard](#)
[Encounter Form](#)
[Form Entry](#)
[Formentry](#)
[Graph](#)
[Gzip](#)
[HL 7 Archive](#)
[HL 7 Processor](#)
[Htmlformentry](#)
[Layout](#)
[Locale](#)
[Location](#)
[Log](#)
[Logic](#)
[Mail](#)
[New Patient Form](#)
[Obs](#)
[Patient](#)
[Patient Identifier](#)
[Patient Search](#)
[Person](#)
[Radiology](#)
[Report](#)

Application Entity Title Title for this application entity	RADIOLOGY_MODULE
Application UID You need a application root UID, this will be the prefix of any module DICOM object, the default value serves for debugging purposes	1.2.826.0.1.3680043.8.2186
Called Application Entity Title Default application entity for DCM4CHEE. Called Application Entity with respect to OpenMRS	DCM4CHEE
Dev Mode On/Off. On to: 1. Set Provider or System developer (if provider does not have privileges) privileges to the roles created by the module	On
Mpps Directory Directory for mpps entries	mpps
Mwl Directory Directory for mwl entries. Ex: d:/tmp/mwl or /tmp/mwl	mwl
Mwl Mpps Port Port of the DICOM MWL and MPPS server	11114
Oviyam Local Server Name Local Server name needed for deploying Oviyam. Must match the local server name created in the Oviyam UI	oviyamlocal
Servers Address IP address of the 2 DICOM servers	localhost
Servers Port Port of the dcm4chee Web	8081
Specific Character Set DICOM working character set	ISO-8859-1
Storage Commitment Port Storage Commitment port that modality uses to confirm a storage of an image	11115
Storage Directory Directory for DICOM objects	storage
Storage Port Port of the DICOM storage server	11116

Adding Radiology Module AET to dcm4chee

- Click on the “Application Entities” tab.
- Click on “New AET”
- Enter these details which are currently default in the module and click save.
 - Title : RADIOLOGY_MODULE
 - Host : localhost {or ip of where OpenMRS is deployed }
 - Port : 11114

OpenMRS Radiology Module

The screenshot shows the dcm4chee-web3 application interface. The top navigation bar includes links for Folder, Trash, Application Entities, Modality Worklist, Teaching-Files, Dashboard, Roles, Users, and Password. The main content area displays a table of Application Entities (AETs) with columns: Title, Type, Host, Port, Description, TLS, MPPS, Station name, Institution, and Department. A red box highlights the 'New AET' button in the top left corner of the AETs section.

Title	Type	Host	Port	Description	TLS	MPPS	Station name	Institution	Department
CDRECORD		localhost	10104	Media Creation Server (part of dcm4chee)	<input type="checkbox"/>	<input type="checkbox"/>			
DCM4CHEE		localhost	11112	This dcm4chee archive instance	<input type="checkbox"/>	<input type="checkbox"/>			
RADIOLOGY_MODULE	-	localhost	11114		<input type="checkbox"/>	<input type="checkbox"/>		OpenMRS	

The screenshot shows the dcm4chee-web3 application interface with the 'Edit AET' dialog box open. The dialog box contains fields for Title, Type, Hostname, Port, Ciphersuite #1, Ciphersuite #2, Ciphersuite #3, Description, Issuer of Patient ID, Issuer of Accession Number, Filesystem Group ID, Wado URL, User Id, Password, Station Name, Institution, Department, Installed, Emulate MPPS, and Delay time for MPPS emulation. A red box highlights the 'Title' field, which contains the text 'RADIOLOGY_MODULE'.

Edit AET

Title: RADIOLOGY_MODULE

Type: -

Hostname: localhost

Port: 11114

Ciphersuite #1: -

Ciphersuite #2: -

Ciphersuite #3: -

Description:

Issuer of Patient ID:

Issuer of Accession Number:

Filesystem Group ID: -

Wado URL:

User Id: admin

Password: *****

Station Name:

Institution: OpenMRS

Department:

Installed: ☐

Emulate MPPS: ☐

Delay time for MPPS emulation:

Save Cancel Echo

Notes about DCM4CHEE

- The default screens in the image archive and Worklist tabs are always empty.
- You will need to run a search to pull up relevant results.
- A search with no parameters will pull all the entries in the database.
- Resetting the search parameter and running the search will retrieve all entries.

a

DCM4CHEE DICOM Arch

localhost:8081/dcm4chee-web3/

Folder Trash Application Entities Modality Worklist Teaching-Files Dashboard Roles Users Password

Logout (admin) Choose One dcm4chee.org

Search

Patient Name Patient ID Patient Name ID Issuer Study Date from to Accession No

☐ Phonetic ☐ Exact search

Modality Source AET

Search for Study Expand To auto **Reset** **Search**

Pagesize 10 Delete Move Export

Show column titles

Patient Name	Patient ID/Issuer	Birth Date	Sex	Comments
Study Date/Time	Study ID	Accession No	Modality	Description #S/#I Availability

OpenMRS Radiology Module

DCM4CHEE DICOM Archi x localhost:8081/dcm4chee-web3/ Logout (admin) Choose One dcm4chee.org

Folder Trash Application Entities Modality Worklist Teaching-Files Dashboard Roles Users Password

Search

Patient Name Patient ID Issuer Study Date to Accession No

Phonetic Modality Source AET

Exact search

Latest studies first Search for Study Expand To auto Reset Search

Pagesize 10 Study 1 to 5 of 5 Delete Move Export

Show column titles

Patient Name	Patient ID/Issuer	Birth Date	Sex	Comments	#S/#I	Availability
Study Date/Time	Study ID	Accession No	Modality	Description		
Akhil^Ravindran	200-6	10/7/1987	M	Demonstration Patient for enhanced XA testing activities!		
9/27/2013 22:35	UNKNOWN		CR	Echocardiogram	1/1	ONLINE
9/27/2013 22:45	UNKNOWN		XA	Echocardiogram	1/1	ONLINE
enhanced XA^Test^^Siemens	SMSenhXAtest200906	11/4/1958	M	Demonstration Patient for enhanced XA testing activities!		
6/2/2009 15:59	090602enhXAAdemo1	20090602SMSenhXA	XA	derived enhXA3D from enhXA rotational Acq1/1	1/1	ONLINE
MR/BRAIN/GRASE/1024	7	1/1/1901	M			
3/30/1995 15:08	191		MR	BRAIN	1/1	ONLINE
Rubo DEMO	123-45-6789	10/16/1923	F			
3/23/1994 11:51	027893462		US	Echocardiogram	1/1	ONLINE

DCM4CHEE DICOM Archi x localhost:8081/dcm4chee-web3/ Logout (admin) Choose One dcm4chee.org

Folder Trash Application Entities **Modality Worklist** Teaching-Files Dashboard Roles Users Password

Search

Patient name Patient ID Issuer Start Date to Accession No

Phonetic ID Station AET Station Name Status

Reset Search

Pagesize 10

Patient Name Birthdate SPS Description Modality SPS Status Start date Station AET Station Name Accession number

OpenMRS Radiology Module

DCM4CHEE DICOM Archi x

localhost:8081/dcm4chee-web3/

Apps The Official Website... Official Site of the Pr... Soccer news, live sc... Sky Sports | Football... Latest Football New... Arsenal Mania - The... Facebook | Home 101 Great Goals - lat... Other bookmarks

Folder Trash Application Entities **Modality Worklist** Teaching-Files Dashboard Roles Users Password

Logout (admin) Choose One dcm4chee.org

Search

Patient Name Patient ID Issuer Start Date Accession No

Patient Name Phonetic ID from to

Modality Station AET Station Name Status

Latest items first

Reset Search

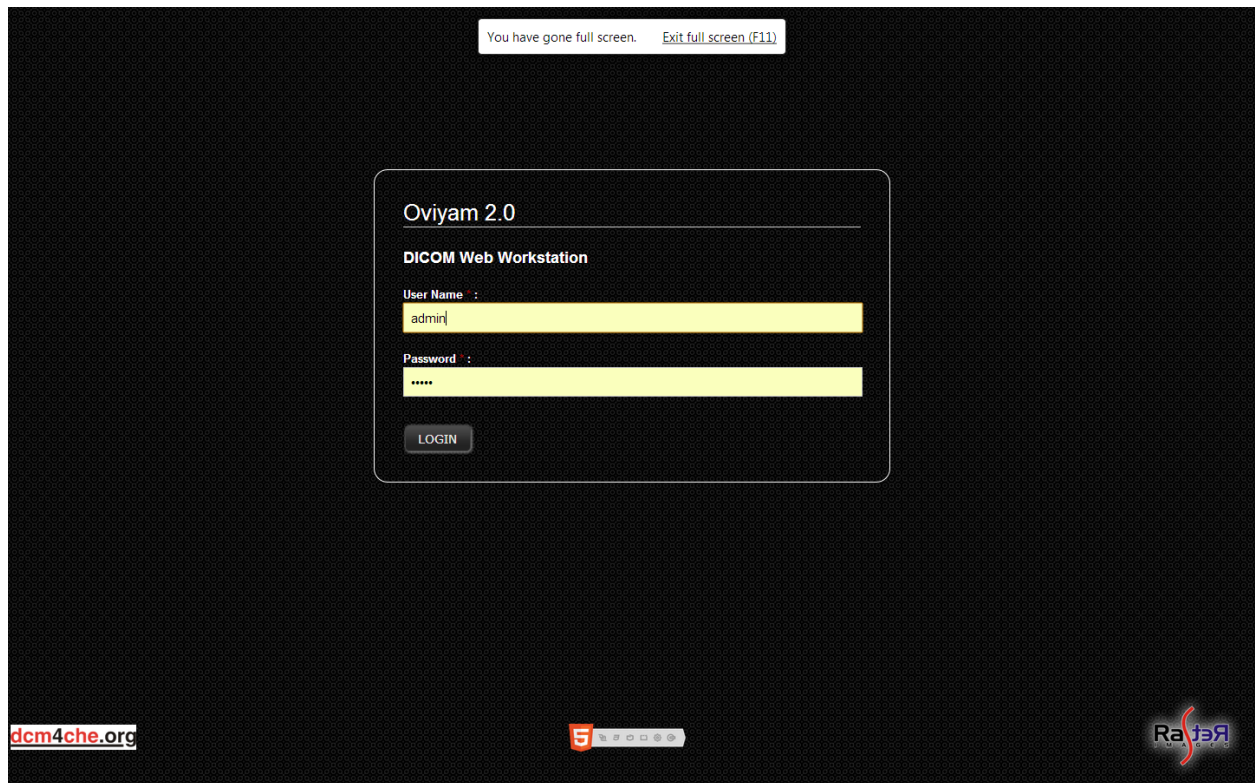
Pagesize 10 Entry 1 to 3 of 3

Patient Name	Birthdate	SPS Description	Modality	SPS Status	Start date	Station AET	Station Name	Accession number
Akhil^Ravindran	10/7/1987	test ct	CR	COMPLETED	9/27/2013 00:00	UNKOWN	UNKOWN	
Akhil^Ravindran	10/7/1987	test xa	XA	COMPLETED	9/27/2013 00:00	UNKOWN	UNKOWN	
Mr.^John^D^Patient	1/1/1975	asdfg	MR	DISCONTINUED	9/27/2013 00:00	UNKOWN	UNKOWN	

Oviyam

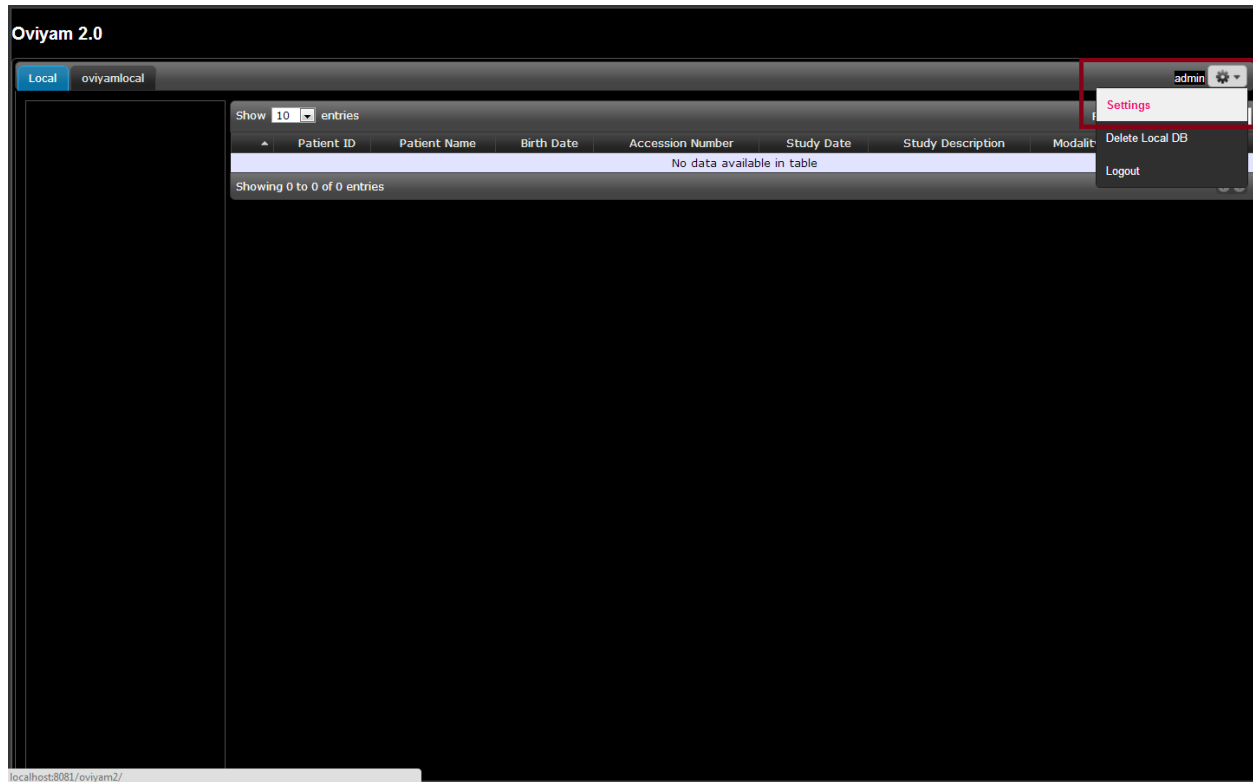
Installation

- Download the package from <http://sourceforge.net/projects/dcm4che/files/Oviyam/2.0/Oviyam-2.0-bin.zip/download>
- Extract the package and copy the war file in to `{install folder}\dcm4chee-2.17.1-mysql\server\default\deploy\`
- Restart or start the server.
- **IMPORTANT: Google Chrome is the recommended browser to use Oviyam.**
- Oviyam can be viewed directly through the link <http://localhost:8081/oviyam2/>
- The login credentials are the same as dcm4chee
User : admin Password: admin



Server Configuration

- Go to the Admin → Settings



- Add the dcm4chee server configuration.
 - Description : oviyamlocal
 - AETitle: DCM4CHEE
 - Host: localhost {It is on the same ip address as dcm4chee}
 - Port: 11112
 - Retrieve Type :WADO
 - WADO Context: wado
 - WADO Port: 8081 {same as the dcm4chee-web3 port}
- Click the save button on the right and click Verify to check if all the settings are correct, if they are correct a green popup will display showing the verification was successful.

Oviyam 2.0

Server Query Param Preferences

Verify Add Edit Delete

Servers

Description	AE Title	Host Name	Port	Retrieve Type	WADO Context	WADO Port
No data available in table						
oviyamlocal	DCM4CHEE	localhost	11112	WADO	wado	8081

Showing 0 to 0 of 0 entries

Listener

AE Title: OVIYAM2
Port: 1025
Update

iOviyam 2.0 Context

iOviyam Context: /oviyam2
Update

- The Home screen for oviyam should display the new server.

Oviyam 2.0

Local oviyamlocal admin

Show 10 entries Filter:

Patient ID	Patient Name	Birth Date	Accession Number	Study Date	Study Description	Modality	Instance Count
No data available in table							

Showing 0 to 0 of 0 entries

Oviyam Notes

- Click on the “oviyamlocal” tab and run an empty search(if there are any images).

Oviyam 2.0 Today CT

Local **oviyamlocal** admin

Search

Patient ID Patient Name Accession Number Birth Date Study Description

Study Date (From) Study Date (to) Referring Physician Modality ALL

Search Reset

Filter:

Patient ID	Patient Name	Date of Birth	Accession #	Study Date	Study Description	Modality	Instance Count
200-6	Akhil^Ravindran	19871007		27/09/2013 22:45:47	Echocardiogram	XA	1
200-6	Akhil^Ravindran	19871007		27/09/2013 22:35:27	Echocardiogram	CR	1
SMSenhXAtest200906	enhanced XA^Test^Siemens	19581104	20090602SMSenhXA	02/06/2009 15:59:48	derived enhXA3D from enhXA rotational Acq	XA	1
7	MR/BRAIN/GRASE/1024	19010101		30/03/1995 15:08:29	BRAIN	MR	1
123-45-6789	Rubo DEMO	19231016		23/03/1994 11:51:04	Echocardiogram	US	1

Showing 1 to 5 of 5 entries

Weasis

Installation

- Alternative Dicom viewer to Oviyam 2.0.
- Java Based DICOM image viewer.
<http://www.dcm4che.org/confluence/display/WEA/Home>
- Integrates within dcm4chee server.
- Requires JAVA Web Start to be installed/enabled to launch from the browser.**
- Installation instructions
<http://www.dcm4che.org/confluence/display/WEA/Installing+Weasis+in+DCM4CHEE>
- After the required WAR files have been deployed on the dcm4chee server, two of the module's settings/properties need to be altered to launch Weasis from OpenMRS.
 - Oviyam Local Server Name** : {leave empty}
 - Viewer URL Path**: /weasis-pacs-connector/viewer.jnlp?

OpenMRS

localhost:8080/openmrs/admin/maintenance/settings.list?show=Radiology

Apps The Official Website... Official Site of the Pr... Soccer news, live sc... Sky Sports | Football... Latest Football New... Arsenal Mania - The... Facebook | Home Getting Started with ... Other bookmarks

Basicmodule
Concept
Concept Drug
Concept Map Type Management
Concepts
Dashboard
Encounter Form
Form Entry
Formentry
Graph
Gzip
HL 7 Archive
HL 7 Processor
Hlmlformentry
Layout
Locale
Location
Log
Logic
Mail
New Patient Form
Obs
Patient
Patient Identifier
Patient Search
Person
Radiology
Report
Report Problem
Reporting
Reportingcompatibility
Scheduler
Search Widget
Security
Serialization
Use Patient Attribute
User
Visits
Webservices
Xforms

Application UID
You need a application root UID, this will be the prefix of any module DICOM object, the default value serves for debugging purposes
1.2.826.0.1.3680043.8.2186

Called Application Entity Title
Default application entity for DCM4CHEE. Called Application Entity with respect to OpenMRS
DCM4CHEE

Dev Mode
On/Off. On to: 1. Set Provider or System developer (if provider does not have privileges) privileges to the roles created by the module
On

Mpps Directory
Directory for mpps entries
mpps

Mwl Directory
Directory for mwl entries. Ex: d:/tmp/mwl or /tmp/mwl
mwl

Mwl Mpps Port
Port of the DICOM MWL and MPPS server
11114

Oviyam Local Server Name
Local Server name needed for deploying Oviyam. Must match the local server name created in the Oviyam UI

Servers Address
IP address of the 2 DICOM servers
localhost

Servers Port
Port of the dcm4chee Web
8081

Specific Character Set
DICOM working character set
ISO-8859-1

Storage Commitment Port
Storage Commitment port that modality uses to confirm a storage of an image
11115

Storage Directory
Directory for DICOM objects
storage

Storage Port
Port of the DICOM storage server.
11116

Study UID Slug
Example: applicationUID+studyUIDSlug+orderId could be a study UID. The default value works!
Example values: 1.2, 1.1, 1 (No start or end dots)
1

Viewer URL Path
URL for Oviyam/Weasis. Default for value Oviyam. For Weasis(needs Java Web Start) : */weasis-pacs-connector/viewer.jsp?*/weasis-pacs-connector/viewer.jsp?

Save Cancel

English (United States) | English (United Kingdom) Last Build: Nov 26 2013 03:56 PM Version: 1.9.1 Build 28992 Powered by OpenMRS

Modality Configuration

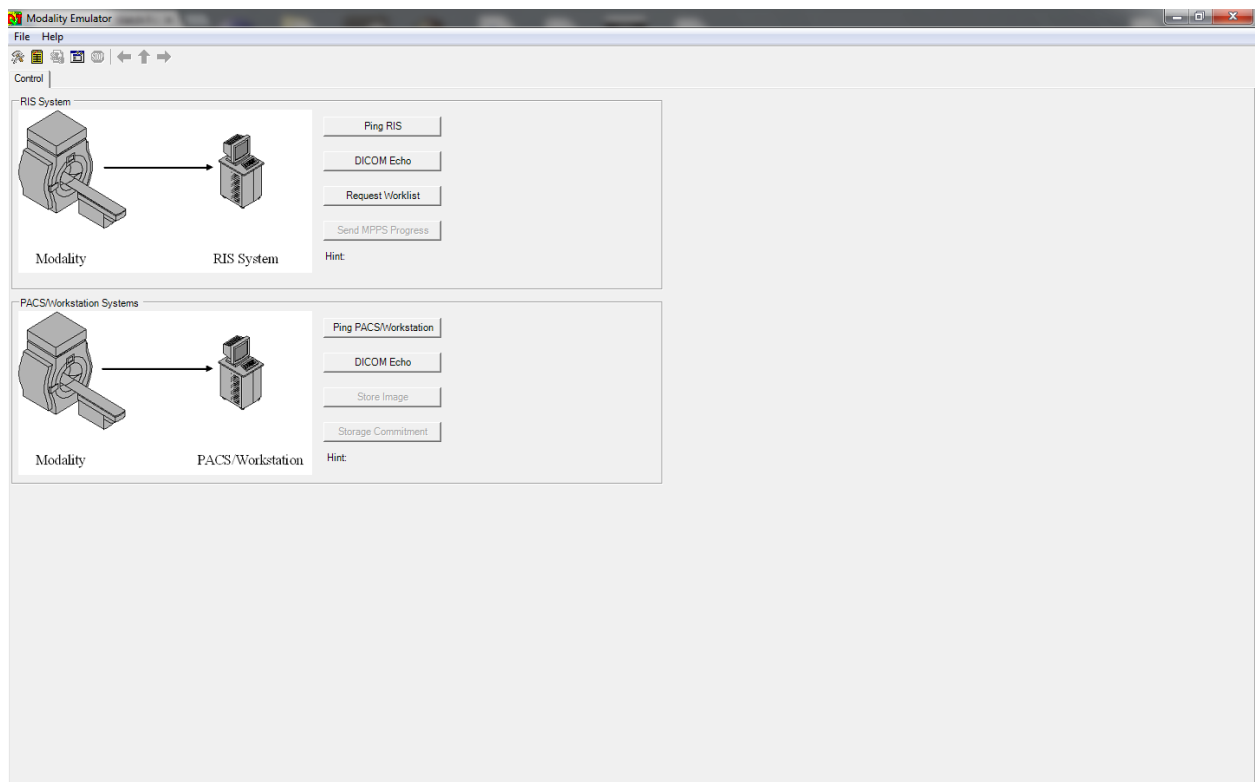
Configuration settings for Modalities

- RIS System
 - IP Address : localhost (IP address of dcm4chee server)
 - Remote Port: 11112
 - AE Title: DCM4CHEE
- MPPS Manager
 - IP Address : localhost (IP address of dcm4chee server)
 - Remote Port: 11112
 - AE Title: DCM4CHEE
- PACS/Workstation Systems
 - IP Address : localhost (IP address of dcm4chee server)
 - Remote Port: 11112
 - AE Title: DCM4CHEE
- Store Commit Config
 - IP Address : localhost (IP address of dcm4chee server)
 - Remote Port: 11112
 - AE Title: DCM4CHEE

Dvtk Modality Emulator

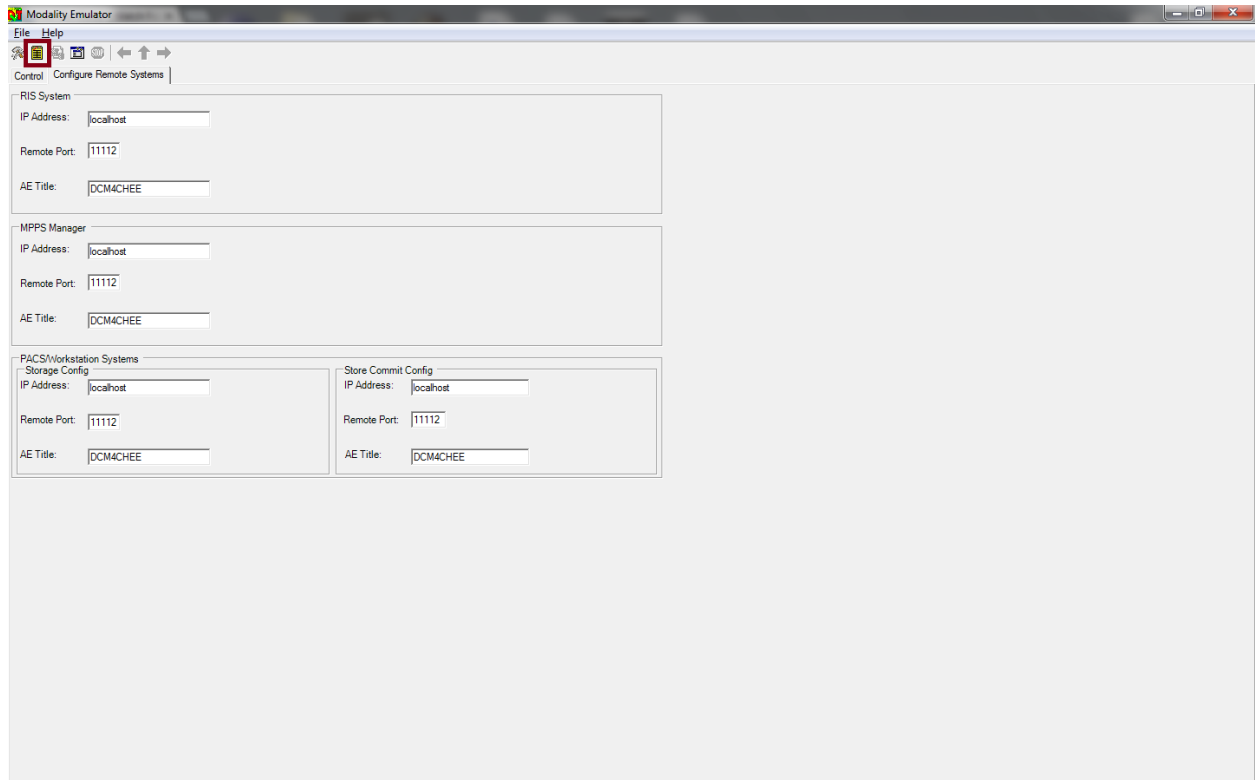
Installation

- **IMPORTANT:** This emulator is available only on Windows.
- Install the Modality Emulator from this link.
<http://dicom.dvtk.org/modules/wiwimod/index.php?page=Download+Modality+Emulator&menu=downloads>
- **IMPORTANT:** Install the DICOM definition files from this link before you run the emulator.
<http://dicom.dvtk.org/modules/wiwimod/index.php?page=Download+DICOM+Definition+Files>
- Run the emulator(there should be an icon for modality emulator in the start menu).
- **IMPORTANT :** In the emulator, a file or setting is selected if the value is highlighted.

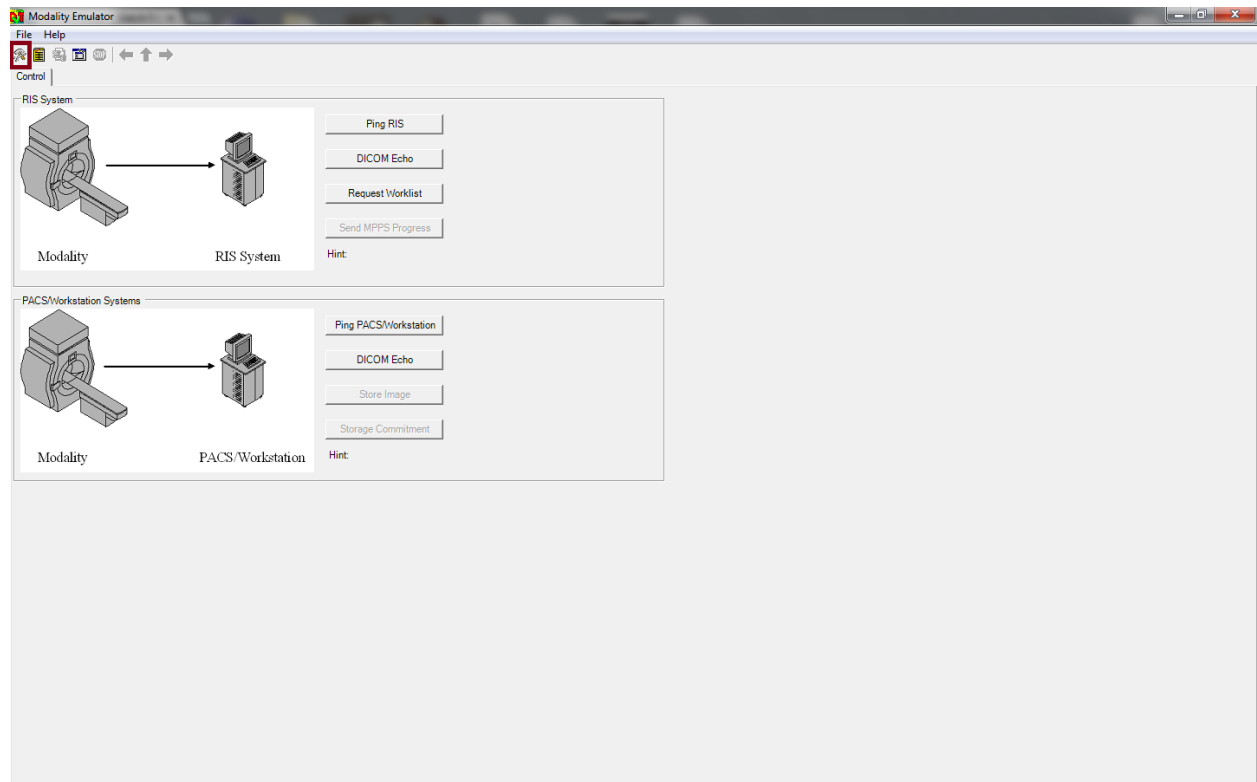


Configure the Emulator

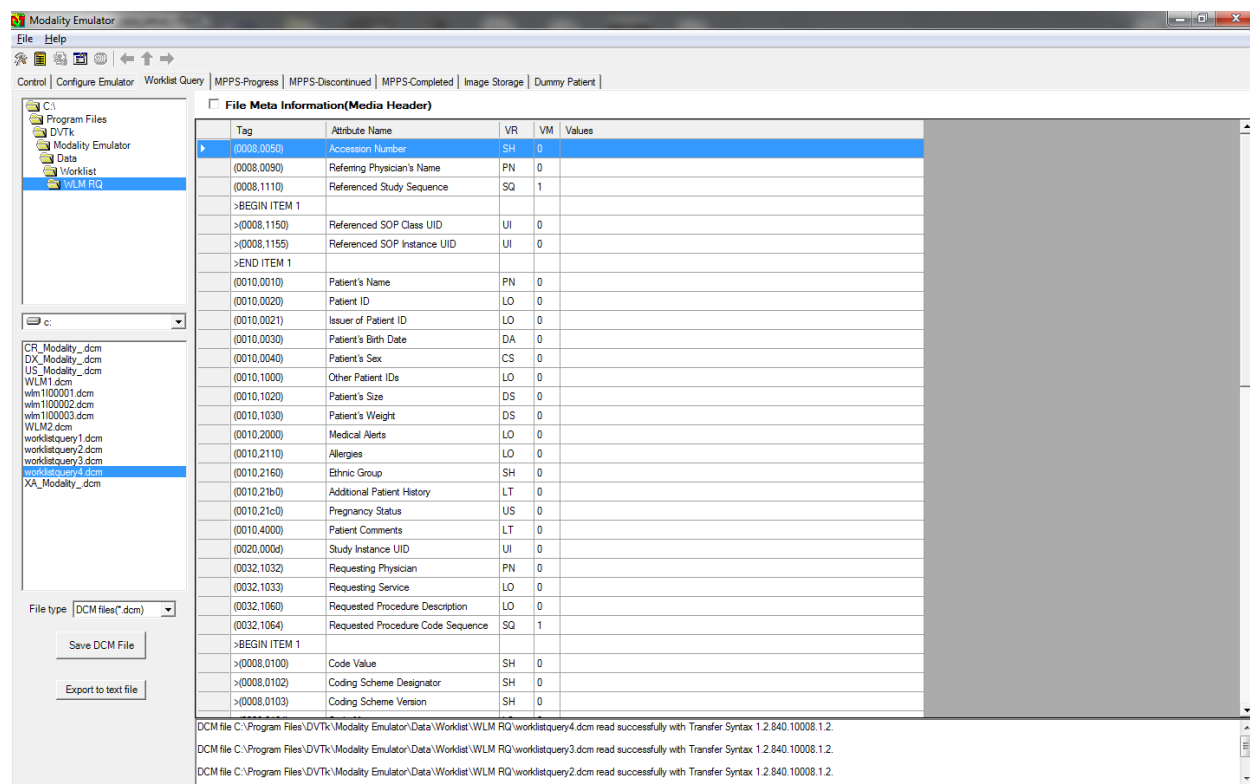
- Click on the “Configure Remote Systems Button.”
 - The IP Address, Remote Port and AE Title are the same for all the different systems.
 - IP Address : localhost (or ip of dcm4chee server)
 - Remote Port : 11112
 - AE Title : DCM4CHEE



- Click on the Configure Emulator button, a number of tabs will be visible.



- Click on the Worklist query Tab.
 - In the bottom left dialog box, choose the file **“worklistquery2.dcm”**.
 - In the right side where all the attributes are displayed, scroll down to the Code Meaning “Scheduled Procedure Step Start Date” and delete the value. (The worklistquery2.dcm is an empty query with only that field having a value).
 - Save the completely empty query to another file called **“worklistquery4.dcm”** and select it.



- In the Image Storage tab, select the images on the left panel using the directory structure for the imaged you wish to send. If a file is highlighted within a folder, it is the file that is selected by the emulator.

The screenshot shows the Modality Emulator application window. The 'File Meta Information (Media Header)' tab is active, displaying a table of DICOM metadata. The table has columns for Tag, Attribute Name, VR, VM, and Values. The first row is highlighted in blue.

Tag	Attribute Name	VR	VM	Values
(0008,0005)	Specific Character Set	CS	1	ISO_IR 100
(0008,0008)	Image Type	CS	5	ORIGINAL\PRIMARY\OTHER\VR
(0008,0012)	Instance Creation Date	DA	1	19960823
(0008,0013)	Instance Creation Time	TM	1	093801
(0008,0014)	Instance Creator UID	UI	1	1.3.46.670589.11.0.5
(0008,0016)	SOP Class UID	UI	1	1.2.840.10008.5.1.4.1.1.4
(0008,0018)	SOP Instance UID	UI	1	1.3.46.670589.11.0.4.1996082307380006
(0008,0020)	Study Date	DA	1	19960330
(0008,0021)	Series Date	DA	1	19960330
(0008,0030)	Study Time	TM	1	150829.0000
(0008,0031)	Series Time	TM	1	155614.6300
(0008,0050)	Accession Number	SH	0	
(0008,0060)	Modality	CS	1	MR
(0008,0070)	Manufacturer	LO	1	Philips
(0008,0080)	Institution Name	LO	1	OTM4 R4.5
(0008,0090)	Referring Physician's Name	PN	0	
(0008,1030)	Study Description	LO	1	BRAIN
(0008,103e)	Series Description	LO	1	Brain STIR GR 512 TRA GrSE 4415 64
(0008,1090)	Manufacturer's Model Name	LO	1	T5
(0010,0010)	Patient's Name	PN	1	MR/BRAIN/GRASE/1024
(0010,0020)	Patient ID	LO	1	7
(0010,0030)	Patient's Birth Date	DA	1	19010101
(0010,0040)	Patient's Sex	CS	1	M
(0010,1030)	Patient's Weight	DS	1	90
(0018,0020)	Undefined	CS	1	IR
(0018,0021)	Undefined	CS	1	OTHER
(0018,0022)	Undefined	CS	0	
(0018,0023)	Undefined	CS	1	2D
(0018,0050)	Undefined	DS	1	6.000000
(0018,0080)	Undefined	DS	1	4414.826172

Below the table, a status message reads: "DCM file C:\Dicom Samples\MRBRAIN.DCM read successfully with Transfer Syntax 1.2.840.10008.1.2.1."

- Make sure the MPPS In Progress, MPPS Discontinued and MPPS Complete Tabs are set correctly with the right MPPS file selected.

MPPS In Progress

The screenshot displays the 'Modality Emulator' application window. The left sidebar shows a file tree with 'C:\Program Files\OpenMRS\Modality Emulator\data\mpps' selected. Below the tree, a file list shows 'mpps-completed1.dcm', 'mpps-discontinued1.dcm', 'mpps-inprogress1.dcm', and 'mpps-inprogress2.dcm' (highlighted with a red box). The main area shows the 'File Meta Information (Media Header)' table.

Tag	Attribute Name	VR	VM	Values
(0008,0000)	Undefined	UL	1	44
(0008,0005)	Specific Character Set	CS	1	ISO_IR 100
(0008,0060)	Modality	CS	1	DX
(0008,1032)	Procedure Code Sequence	SQ	1	
(0008,1120)	Referenced Patient Sequence	SQ	1	
(0010,0000)	Undefined	UL	1	98
(0010,0010)	Patient's Name	PN	1	DICOM2 Validation^NR 1
(0010,0020)	Patient ID	LO	1	PA2
(0010,0021)	Issuer of Patient ID	LO	1	Issuer of Patient ID1
(0010,0030)	Patient's Birth Date	DA	1	19710101
(0010,0040)	Patient's Sex	CS	1	M
(0018,0000)	Undefined	UL	1	8
(0018,115e)	Image and Fluoroscopy Area Dose Pro...	DS	0	
(0020,0000)	Undefined	UL	1	22
(0020,0010)	Study ID	SH	1	Procedure ID1
(0040,0000)	Undefined	UL	1	187
(0040,0241)	Performed Station AE Title	AE	1	DVT
(0040,0242)	Performed Station Name	SH	0	
(0040,0243)	Performed Location	SH	0	
(0040,0244)	Performed Procedure Step Start Date	DA	1	20060719
(0040,0245)	Performed Procedure Step Start Time	TM	1	134937
(0040,0250)	Performed Procedure Step End Date	DA	0	
(0040,0251)	Performed Procedure Step End Time	TM	0	
(0040,0252)	Performed Procedure Step Status	CS	1	IN PROGRESS
(0040,0253)	Performed Procedure Step ID	SH	1	1605.0
(0040,0254)	Performed Procedure Step Description	LO	0	
(0040,0255)	Performed Procedure Type Description	LO	0	
(0040,0260)	Performed Protocol Code Sequence	SQ	1	
(0040,0270)	Scheduled Step Attributes Sequence	SQ	1	
>BEGIN ITEM 1				

DCM file C:\Program Files\OpenMRS\Modality Emulator\data\mpps\mpps-inprogress2.dcm read successfully with Transfer Syntax 1.2.840.10008.1.2

MPPS Completed

The screenshot displays the Modality Emulator application window. The title bar reads "Modality Emulator". The menu bar includes "File" and "Help". The toolbar contains icons for file operations and navigation. The status bar at the top shows "Control | Configure Emulator | Worklist Query | MPPS-Progress | MPPS-Discontinued | **MPPS-Completed** | Image Storage | Dummy Patient".

The left sidebar shows a file tree with the following structure:

- C:\
- Program Files
- DVTK
- Modality Emulator
 - data
 - mpps

The file explorer shows the contents of the "mpps" folder, including "mpps-completed1.dcm", "mpps-discontinued1.dcm", "mpps-inprogress1.dcm", and "mpps-inprogress2.dcm". The "File type" is set to "DCM files (*.dcm)".

The main area displays the "File Meta Information(Media Header)" table:

Tag	Attribute Name	VR	VM	Values
(0008,0000)	Undefined	UL	1	8
(0008,1032)	Procedure Code Sequence	SQ	1	
(0018,0000)	Undefined	UL	1	14
(0018,115e)	Image and Fluoroscopy Area Dose Pro...	DS	1	0.5703
(0040,0000)	Undefined	UL	1	276
(0040,0250)	Performed Procedure Step End Date	DA	1	20060719
(0040,0251)	Performed Procedure Step End Time	TM	1	135446
(0040,0252)	Performed Procedure Step Status	CS	1	COMPLETED
(0040,0254)	Performed Procedure Step Description	LO	0	
(0040,0255)	Performed Procedure Type Description	LO	0	
(0040,0260)	Performed Protocol Code Sequence	SQ	1	
(0040,0281)	Performed Procedure Step Discontin...	SQ	1	
(0040,0301)	Total Number of Exposures	US	1	2
(0040,030e)	Exposure Dose Sequence	SQ	1	
>BEGIN ITEM 1				
>(0018,0000)	Undefined	UL	1	52
>(0018,0060)	KVP	DS	1	48.0
>(0018,1150)	Exposure Time	IS	1	23
>(0018,115a)	Radiation Mode	CS	1	PULSED
>(0018,8151)	X-Ray Tube Current in uA	DS	1	259085.0
>END ITEM 1				
>BEGIN ITEM 2				
>(0018,0000)	Undefined	UL	1	52
>(0018,0060)	KVP	DS	1	46.0
>(0018,1150)	Exposure Time	IS	1	16
>(0018,115a)	Radiation Mode	CS	1	PULSED
>(0018,8151)	X-Ray Tube Current in uA	DS	1	242655.0
>END ITEM 2				
(0040,0310)	Comments on Radiation Dose	ST	1	1, Hand pa, 48kV, 5.946mAs, 22.95ms, SID 1100, EI 80, 0mmA, 0.3575dGycm2, 2, ...
(0040,0321)	Film Consumption Sequence	SQ	1	

The status bar at the bottom indicates: "DCM file C:\Program Files\DVTK\Modality Emulator\data\mpps\mpps-completed1.dcm read successfully with Transfer Syntax 1.2.840.10008.1.2."

MPPS DISCONTINUED

The screenshot displays the 'Modality Emulator' application window. The 'MPPS-Discontinued' tab is active, showing a table of DICOM file meta-information. The table includes columns for Tag, Attribute Name, VR, VM, and Values. The file is identified as 'mpps-discontinued1.dcm'.

Tag	Attribute Name	VR	VM	Values
(0008,0000)	Undefined	UL	1	8
(0008,1032)	Procedure Code Sequence	SQ	1	
(0018,0000)	Undefined	UL	1	14
(0018,115e)	Image and Fluoroscopy Area Dose Pro...	DS	1	0.5703
(0040,0000)	Undefined	UL	1	278
(0040,0250)	Performed Procedure Step End Date	DA	1	20060719
(0040,0251)	Performed Procedure Step End Time	TM	1	135446
(0040,0252)	Performed Procedure Step Status	CS	1	DISCONTINUED
(0040,0254)	Performed Procedure Step Description	LO	0	
(0040,0255)	Performed Procedure Type Description	LO	0	
(0040,0260)	Performed Protocol Code Sequence	SQ	1	
(0040,0281)	Performed Procedure Step Discontin...	SQ	1	
(0040,0301)	Total Number of Exposures	US	1	2
(0040,030e)	Exposure Dose Sequence	SQ	1	
>BEGIN ITEM 1				
>(0018,0000)	Undefined	UL	1	52
>(0018,0060)	KVP	DS	1	48.0
>(0018,1150)	Exposure Time	IS	1	23
>(0018,115a)	Radiation Mode	CS	1	PULSED
>(0018,8151)	X-Ray Tube Current in uA	DS	1	259085.0
>END ITEM 1				
>BEGIN ITEM 2				
>(0018,0000)	Undefined	UL	1	52
>(0018,0060)	KVP	DS	1	46.0
>(0018,1150)	Exposure Time	IS	1	16
>(0018,115a)	Radiation Mode	CS	1	PULSED
>(0018,8151)	X-Ray Tube Current in uA	DS	1	242655.0
>END ITEM 2				
(0040,0310)	Comments on Radiation Dose	ST	1	1, Hand pa, 48kV, 5.946mAs, 22.95ms, SID 1100, EI 80, 0mmAl, 0.3575dGycm2, 2, ...
(0040,0321)	Film Consumption Sequence	SQ	1	

DCM file C:\Program Files\DVTK\Modality Emulator\data\mpps\mpps-discontinued1.dcm read successfully with Transfer Syntax 1.2.840.10008.1.2.