

# OpenMRS Radiology Module Installation Guide



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The Radiology module for OpenMRS is software that supports the radiology department workflow with the power of informatics technologies; it has been designed with third party free or open source software components adapted to accomplish all DICOM operations it performs. Its development is based on Java Programming Language and tools that allow an agile and incremental development such as Eclipse IDE and Subversion.

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# RADIOLOGY MODULE INSTALLATION GUIDE

## INTRODUCTION

The Radiology module for OpenMRS supports the clinical part of the radiology department workflow by integrating the functionalities of EHR, RIS and PACS. These functionalities conform to the DICOM standard and follow recommendations from the radiology community (IHE, RSNA and ACR). It has been developed by integrating third party free and open source software components adapted to accomplish those standard functionalities..

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### 1. SYSTEM REQUIREMENTS

The hardware required depends on the size of your implementation. For small implementations, OpenMRS can be run on just about any desktop or laptop.

#### **Minimum Requirements - 100s of patients**

1 GHz processor or better, 256 MB of memory or more, 40 GB hard drive or larger. You can set up the server on a laptop for demonstration or testing purposes.

#### **Minimum Requirements - 10,000 patients**

1.5+ GHz, 2 GB of memory, and 150+ GB of disk space with RAID and appropriate backup facilities.

#### **Minimum Requirements - 250,000 patients**

AMPATH is supporting an OpenMRS instance with over 250,000 patients with two 2.26 GHz quad processors, 16 GB of memory, 500 GB of disk space with RAID and appropriate backup facilities.

### 2. MODULE INSTALLATION

Installation of the radiology module step by step:

1. Install OpenMRS<sup>1</sup>. The module was developed and tested in version 1.9 (to date, a development version). You can install OpenMRS either by automatic or manual procedure:

#### AUTO INSTALLATION (the easier way)

1. Download the standalone version of OpenMRS<sup>2</sup>. It is packed in a multiplatform way.
2. Deploy OpenMRS, just running the standalone version of OpenMRS (remember that it requires a Java Virtual Machine to run the Tomcat server it has bundled).

#### MANUAL INSTALLATION

1. Install MySQL server.
2. Install Apache Tomcat server (recommended) or another servlet container. Remember that Tomcat requires a Java Virtual Machine to run.
3. Download OpenMRS web application archive. It is a file that by convention has the war extension (openmrs.war)<sup>3</sup>.
4. Deploy OpenMRS, either:
  1. Copying the web application archive under webapps folder of Tomcat directory or
  2. From the Tomcat manager application.

Remember that you need a web browser to access the application.

2. Download the source code of the radiology module at <http://svn.openmrs.org/openmrs-modules/radiology/>. You can use Subclipse<sup>4</sup> or another subversion client of your preference to do this. The project is ready to use with Eclipse. Figures 1, 2 and 3 show how to check out the module source code from the OpenMRS repository in Internet.

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<sup>1</sup> <https://wiki.openmrs.org/display/docs/Installing+OpenMRS>.

<sup>2</sup> <http://openmrs.org/download/>

<sup>3</sup> <http://openmrs.org/download/>

<sup>4</sup> Subclipse installation instructions: <http://subclipse.tigris.org/servlets/ProjectProcess?pageID=p4wYuA>.

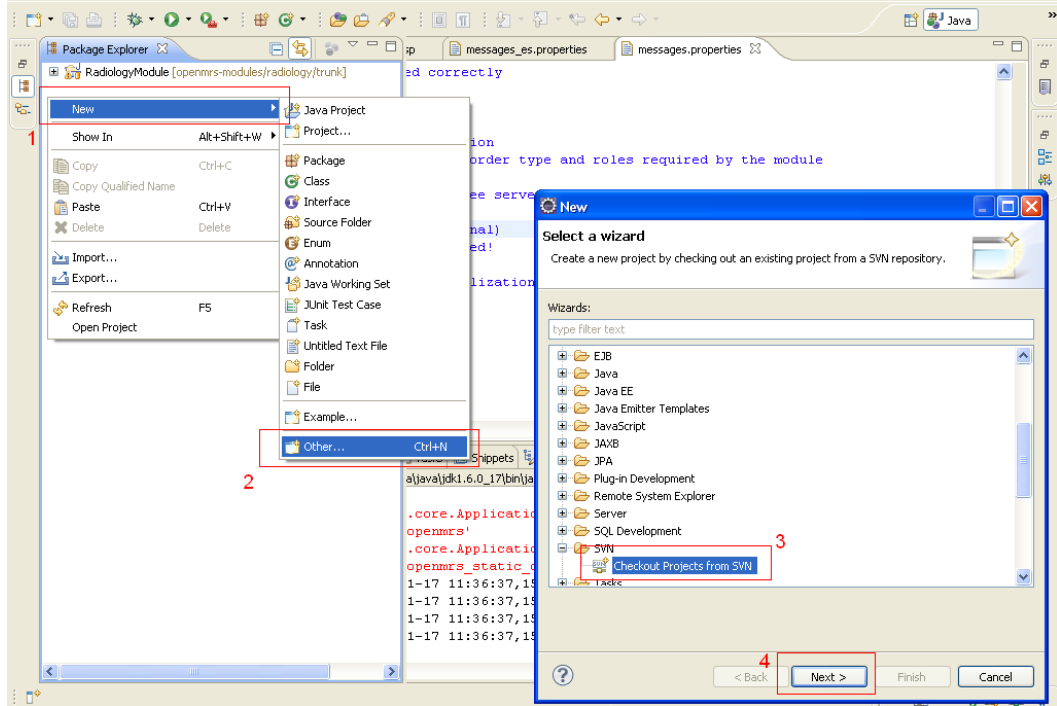


Figure 1. Check out module source code – 1.

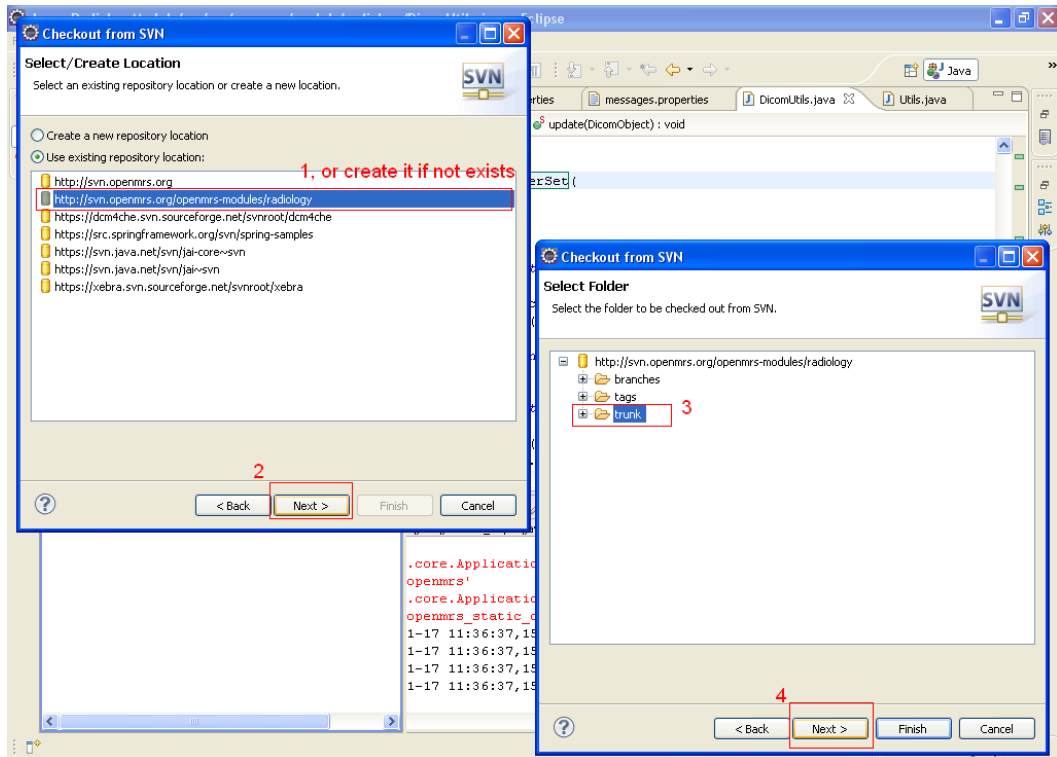


Figure 2. Check out module source code – 2.

Remember that the repository location is <http://svn.openmrs.org/openmrs-modules/radiology/>.

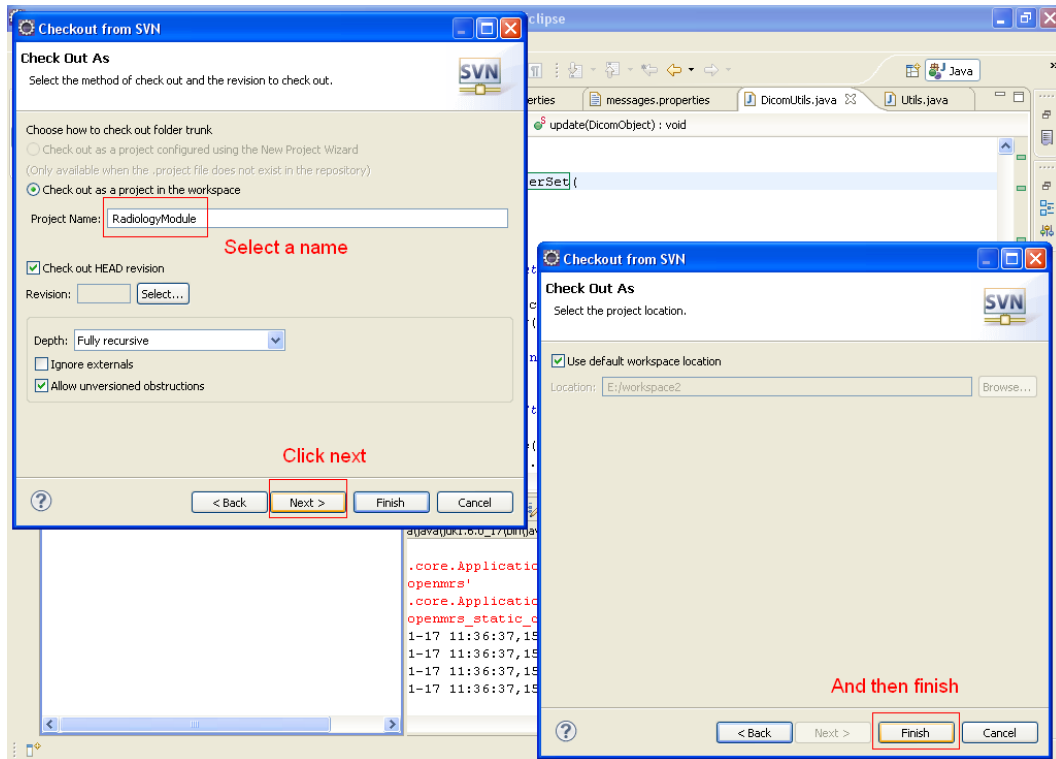


Figure 3. Check out module source code – 3.

When the process is finished you should have the project in your workspace.

3. Build on Eclipse (Figure 4): open the file build.xml, then open outline (1), and after that right-click on package-module task, hover over “Run As” and click “Ant Build” (2).

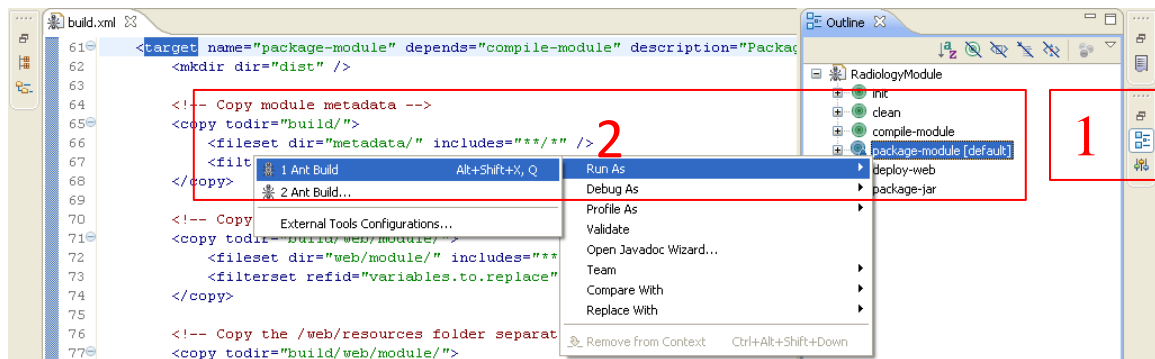


Figure 4. Build module source code.

4. Install the file with the .omod extension on OpenMRS –this file contains the module– which is generated under dist directory. You can either:
  1. Copy the file on the modules folder (on windows: C:\Documents and Settings\user\Application Data\OpenMRS\modules) (you will need to restart the server) or,

2. Install the file from the OpenMRS web console (Figure 5), under the Administration tab (1), Manage Modules link (2).

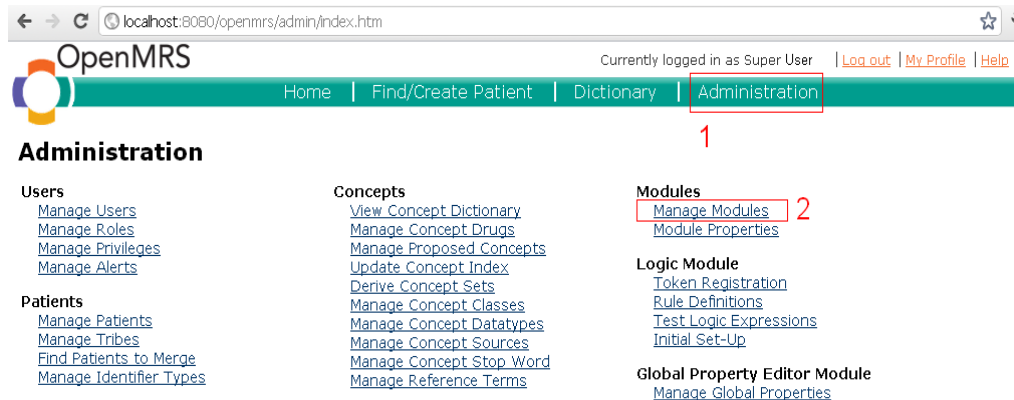


Figure 5. Manage Modules from web console.

You can start and stop the module in the Manage Modules link under the Modules section of the admin page at <http://localhost:8080/openmrs/admin/index.htm> (If you have the server in your machine).

5. The admin page should contain a Radiology Module section if the module has been successfully started (Figure 6).

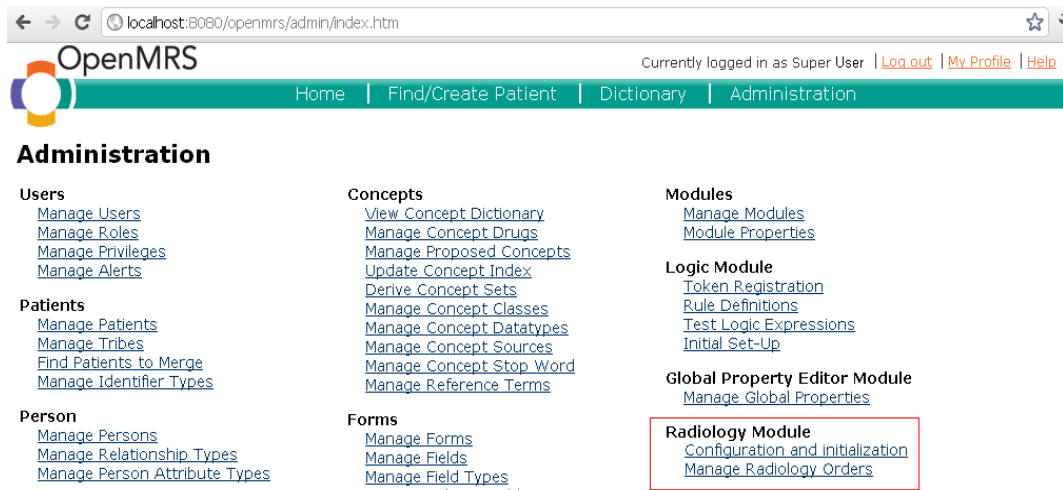


Figure 6. Radiology Module section.

### 3. INITIAL CONFIGURATION

Global properties are values used to customize the module behavior.

Use the global property editor module<sup>5</sup> to modify the default module configuration (in version 1.9 of OpenMRS you can use the Settings link under the Maintenance section). You should configure the variables displayed on Figure 7.

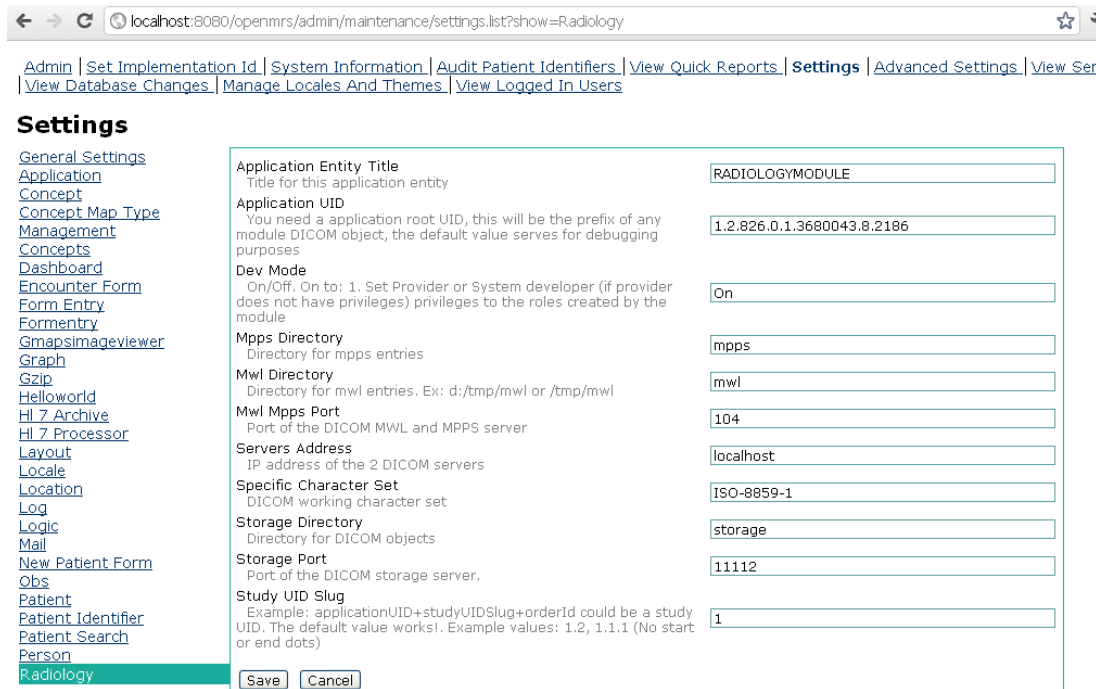


Figure 7. Settings page.

Available character set values for “Specific Character Set” property:

US-ASCII, ISO-8859-1, ISO-8859-2, ISO-8859-3, ISO-8859-4, ISO-8859-5, ISO-8859-6, ISO-8859-7, ISO-8859-8, ISO-8859-9, JIS\_X0201, TIS-620, US-ASCII, ISO-8859-1, ISO-8859-2, ISO-8859-3, ISO-8859-4, ISO-8859-5, ISO-8859-6, ISO-8859-7, ISO-8859-8, ISO-8859-9, JIS\_X0201, TIS-620, JIS0208, JIS0212, cp949, UTF-8, GB18030.

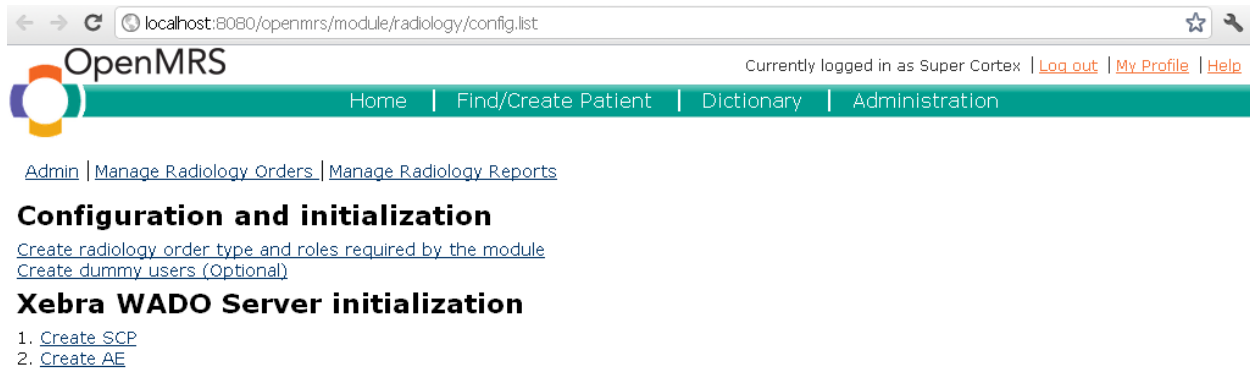
This character set will be used for encoding entries in the worklist.

The directories specified are prefixed with the actual working directory. It depends from where you are running the Tomcat server., By default it would be something like e:\apache-tomcat\bin. You can check out the server console to confirm where the files are being saved.

Changes in these properties require restarting the module in order to take effect.

Additionally, there is a page where you can initialize the module (starting from the Configuration and initialization link in Figure 6). This is in case the OpenMRS start process doesn't have enough privileges to set some required values (Figure 8):

<sup>5</sup> Download from <https://dev.openmrs.org/modules/view.jsp?module=globalpropertyeditor>



*Figure 8. Configuration and initialization page.*

The first link (Create radiology order type and roles required by the module) creates a radiology order type and four new roles (Referring physician, Scheduler, Performing physician, Reading physician) required by the module.

The second link (Create dummy users (Optional)) creates dummy users with the four roles above mentioned; this is optional.

The third link (Create SCP) and the fourth one (Create AE) need to be performed in the order listed; they create two entries that Xebra WADO server needs in the database.