KenyaEMR Setup Instructions on Linux (Ubuntu)

IDE: IntelliJ IDEA

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(A) Prerequisite Software

Software	Check	Installation Command(s)

Oracle JDK	`java -version`	`sudo add-apt-repository ppa:webupd8team/java`
		`sudo apt-get update`
		`sudo apt-get install oracle-java7-installer`

MySQL	`mysql --version`	`sudo apt-get install mysql-server`
Maven	`mvn --version`	`sudo apt-get install maven`
Git	`git --version`	`sudo apt-get install git`
IntelliJ IDEA Ultimate		Ensure that you have a JDK installation on your machine by running `java -version` Go to www.jetbrains.com and download the latest version of IntelliJ IDEA Ultimate. It is available as a tarball with a ".tar.gz" extension. Extract the tarball in a folder of your choice. Navigate to the bin folder within the folder where you have extracted the tarball. Locate the idea.sh file and run `bash idea.sh`. This will install and launch IntelliJ.

Notes

1. While you may use OpenJDK for your KenyaEMR development, IntelliJ cautions that doing so may cause graphics and performance problems and therefore recommends Oracle JDK instead.
2. Oracle JDK is not available in the standard Ubuntu software package repositories. That is the reason you have to add the "`ppa:webupd8team/java`" third-party repository before installing it.
3. When installing MySQL, you will be required to specify a password for the root account. Be careful to remember it.
4. You need to install IntelliJ IDEA Ultimate as opposed to Community edition. This ensures that you get support for enterprise development frameworks such as Spring in the IDE. You may get a free

license for IntelliJ IDEA Ultimate if you are a contributor to an open source software project such as OpenMRS.

5. In order to be able to launch IntelliJ from the dash, open the IDE via `bash idea.sh` and then from within the IDE, go to *Tools → Create Desktop Entry*.

(B) Downloading and Importing KenyaEMR Source Code

This section assumes that you have forked KenyaEMR from the main I-TECH account to your own Github account.

Steps

1. In IntelliJ, go to *File → New Project.* Alternatively, you may select *Create Project* on the initial *Quick Start* Window.
2. Select *Empty Project*, give it a name e.g. *"kenya-emr"* and select the folder where you want to save it e.g. *"/home/gitahi/IdeaProjects/kenya-emr"*.
3. Using git, navigate to the *kenya-emr* folder and clone the OpenMRS, KenyaEMR and KenyaUI repositories into the *kenya-emr* folder. Unless you plan to contribute code to the main OpenMRS repository, it is not necessary to fork it to your github account. You do need to fork the KenyaEMR and the KenyaUI repositories though since you want to contribute code for those.

IMPORTANT: You must remember to check out the appropriate version (tag) of OpenMRS required by KenyaEMR (e.g. *git checkout 1.9.3*). As at the time of writing this document, the required version is as 1.9.3.

Repository	Source on Github
openmrs-core	Main repo on the openmrs account
openmrs-module-kenyaemr	Your own fork on your account

You may also wish to clone the source code for other modules required by KenyaEMR in case you would like to examine it. Otherwise it is not necessary. Maven will download them for you as *.omod* files since they are configured as dependencies for the KenyaEMR module. The table below shows a (not necessarily complete) list of such modules and where on github you may obtain them. Feel free to fork them into your account and clone them from there especially if you want to contribute code for them.

Repository	Source on Github
openmrs-module-kenyaui	Main repo on the I-TECH account
openmrs-module-kenyacore	Main repo on the I-TECH account
openmrs-module-kenyadq	Main repo on the I-TECH account
openmrs-module-calculation	Main repo on the openmrs account
openmrs-module-htmlformentry	Main repo on the openmrs account

openmrs-module-reporting	Main repo on the openmrs account
openmrs-module-uiframework	Main repo on the openmrs account

4. Next, you will import the contents of the cloned repos as modules into your *kenya-emr* project in IntelliJ. Before you do that, you may consider renaming the OpenMRS modules by removing the *openmrs-module* prefix – just to make the names easier to read and write.
5. In IntelliJ, go to *File → Import Module → Import Module from External Model → Maven*
6. Follow the Wizard, generally accepting the defaults. If prompted to select a JDK, point to the Oracle JDK installed earlier. Click on *Finish* when done. The module will show up within the *kenya-emr* project.
7. Repeat steps 5 and 6 for all the modules you want on your IDE.

(C) Setting Up Jetty Server

In order to run the OpenMRS web application from within IntelliJ, you will need to set up the Jetty web server and servlet container. Jetty is installed as a plugin within the IDE when you install IntelliJ.

Steps

1. In IntelliJ, go to *Run → Edit Configuration*. Then press the + button to create a new configuration based on default settings.
2. Under *Add New Configuration*, select *Maven* and type *OpenMRS Jetty* as the name of your configuration. You may choose *Single instance only* so that you always have a single instance of OpenMRS running every time.
3. Next, enter the following parameters in the *Parameters* tab.

Name	Value
Working directoty	The webapp directory in openmrs-core e.g. */home/gitahi/IdeaProjects/kenya-emr/openmrs-core/webapp*
Command line	jetty:run

4. In the *Runner* Tab, uncheck *Use Project Settings* and enter *-Xmx1024m -XX:MaxPermSize=256m* in the *VM Options* text box. This sets the maximum memory that can be allocated to the JVM when running OpenMRS. You may allocate more depending on how much RAM you have on your system.
5. Select the JRE installed along with the Oracle JDK installed earlier.
6. You may chose *Skip Tests* so that running the project takes much less time and then enter the following properties. These properties tell Jetty where to find GSPs when running from within IntelliJ. Of course you need to edit the folder paths to reflect your directory structure.

Key	Value
webapp.name	openmrs

uiFramework.development.kenyaemr	/home/gitahi/IdeaProjects/kenya-emr/kenyaemr
uiFramework.development.kenyaui	/home/gitahi/IdeaProjects/kenya-emr/kenyaui

(D) Compiling and Running OpenMRS

1. In order to run KenyaEMR, you must first compile and run OpenMRS itself. KenyaEMR runs on top of OpenMRS. This section explains how to setup OpenMRS.
2. In your home folder, create a folder called *.OpenMRS* and in it another one called *modules*.
3. Download the logic module (*.omod*) from the OpenMRS Module Repository and paste in in the *modules* folder created previously. The logic module is a core OpenMRS module. OpenMRS cannot run without it.
4. Navigate to the *openmrs-core* folder and compile OpenMRS by running `mvn -DskipTests clean install`.
5. In IntelliJ, go to *Run → Run 'OpenMRS Jetty'* and then using your browser*,* Navigate to *localhost:8080* and launch OpenMRS. The OpenMRS installation wizard will start and guide you through the process of creating the OpenMRS database and setting up the OpenMRS superuser. It will also create a file called *openmrs-runtime.properties* and save it in your *.OpenMRS* folder.
6. Once the installation wizard is finished the OpenMRS web application login page will be displayed and you may login using the username and password specified during the installation.
7. Some OpenMRS modules require a super user account to authenticate. This account's username and password are set in the global properties *scheduler.username* and *scheduler.password*. Usually the default username set is *admin* and the password is *test*. If your super user username happens to be *admin* and your password is not *test*, these modules will keep attempting to authenticate unsuccessfully causing the system to lock that *admin* account. To prevent this from happening, see step 8.
8. In OpenMRS, go to *Admin → Maintenance → Settings → Scheduler* and set the correct user username and password for the scheduler. Typically you want to set super user credentials here.
9. In case you miss the step above and end up locked out of your account, manually delete all records in the *user_property* table to unlock your account. Also, locate the scheduler username and password properties in the *global_property* table and set them as explained in step 8.
10. At this point, you have completed OpenMRS setup. Next, you will set up KenyaEMR on top of OpenMRS.

(D) Compiling and Running KenyaEMR

1. KenyaEMR is designed to alter and also add to OpenMRS functionality. This is achieved by adding KenyaEMR along with other modules to the standard OpenMRS installation you already have. It also involves updating the standard OpenMRS concept dictionary with the MV/CIEL concept dictionary. Both these things are explained in the next steps.
2. To build the KenyaEMR module and download the OpenMRS modules that it depends on, run `mvn -DbuildDistro -DskipTests clean package`. This will create a zip file containing the

KenyaEMR modules and the modules it depends on and place it in the *distro/target* folder. Extract the contents of this folder and copy them into the *.OpenMRS/modules* folder.

3. To update the standard OpenMRS concept dictionary with the MV/CIEL concept dictionary, obtain an SQL dump of the MV/CIEL concept dictionary from I-TECH Kenya. Apply the MV/CIEL SQL script by running it against the standard OpenMRS database.
4. Finally, restart the Jetty server and open your browser to access KenyaEMR. The system will launch a first time setup wizard and then let you log in with your username and password thereafter.

Using KenyaEMR

In order to flawlessly access KenyaEMR functionality as a user, it is necessary to log into the system with an account that has the 'Provider' role. The easy way to do this as a developer is to simply add this role to the super user account. Attempting to access certain KenyaEMR features will fail if you do not have the 'Provider' role. You may not be able to fill in a triage form, for example.

Creating a Simple Data Entry Form

A good place to begin to experience the power of the OpenMRS/KenyaEMR system is by creating data entry forms. Anyone who understands concept mapping and can write markup can create a simple data entry form in KenyaEMR through the following steps.

1. Define a new form through the main OpenMRS admin page. *Admin → Manage Forms → Add Form*
2. Define a new *FormDescriptor* bean for the form in the *[project folder]/kenyaemr/api/src/main/resources/moduleApplicationContext.xml* configuration file.
3. Define the form content as an XML file in *[project folder]/kenyaemr/omod/src/main/webapp/resources/htmlforms/*. Knowledge of concept mapping is important during this step.
4. Re-package and re-deploy (copy generated **.omod* files over into the *.OpenMRS/modules* folder) the KenyaEMR module.

FAQ

1. What do I do if the logic module fails to start?

Update *logic.started = true* in the *global_property* table.