eTB Manager – Developer Handbook

Summary

1. Objective

The objective of this document is to describe the initial procedures to setup a development environment for eTB Manager.

2. For whom this guide is intended?

This guide is intended to be used by Java developers that will start working with eTB Manager programming.

3. About eTB Manager

eTB Manager is a web based system for tuberculosis surveillance and management. At the moment this guide was written, eTB Manager is translated in more than 10 languages and is under production or being implemented in more than 6 countries. Today the system is available for demonstration in http://www.etbmanager.org.

4. Technologies involved

Programming language

eTB Manager was totally developed in Java ™ language and up to now only open-source technologies was used in its development. Inside the Java ecosystem of technologies, the following frameworks were used:

- **JVM 1.6** – The Java Virtual Machine
- **JSF 1.1** – The Java Server Faces framework
- **Hibernate 3** – Java persistence framework for object/relational mapping. More info at www.hibernate.org;
- **SEAM 2.2.1** – Integrates several technologies inside the business layer. More into at www.seamframework.org;
- **Facelets** – Web template framework for development of user interfaces using JSF;
- **RichFaces 3** – UI component framework supporting Ajax capabilities into business applications using JSF. More info at http://www.jboss.org/richfaces;

It's also important to mention the technologies used in the user interface:

- **XHTML pages** – The page where HTML tags and JSF components are inserted;
- **CSS** – To control the look and feel of the application;
- **Javascript** – It's largely used inside the XHTML pages;
- **jQuery framework** – It's a Javascript framework that makes it easier to manipulate the DOM elements in a HTML page. More info at http://jquery.com/;

5. Downloading and installing the required software

Required hardware

In order to have the development environment properly set, you need a good computer to host all applications. If you check the requirements for the software involved, you will see that it doesn't require much in terms of processing, but remember that you will have to run in a single machine the database server, the application server and the IDE, and some operations may take a long time if you don't have a proper computer, or if you just fulfill the minimal requirements. So, below you'll find the hardware requirements to a development environment that will not let you down:

- Intel Core i5 (equivalent or higher);
- 4Gb of RAM;
- Minimum of 2Gb of HD space;
- High speed Internet connection;

Because this document is for a Windows development environment, we recommend the use of Windows 7 Professional or higher, but the same environment can be installed in different environments (like Linux or Mac OSX).

Required Software

To setup the development environment it'll be necessary to download the following programs:

- Java SDK;
- Eclipse IDE;
- JBOSS plugin;
- Resource Bundle Editor;
- MySQL Database Server;
- MySQL GUI Tools;

The integrated development environment (IDE) in use is basically the Eclipse IDE with some extra plug-ins. Read the sections bellow to learn how to setup the environment.

Installing Java

Java is not only the language used for the development, but also the Virtual Machine that runs eTB Manager, the Jboss AS and the development environment. Chances are that you already have Java installed in your computer, but if you have never downloaded Java before, it is recommended that you download the latest release of the Java JDK 1.6 at

http://www.oracle.com/technetwork/java/javase/downloads/index.html

The latest released of the JVM 1.6 version available up to now is release 6u45. Click on the Download button and install the JVM.

Installing JBOSS AS

eTB Manager runs under the JBOSS Application Server version 4.2.3.GA. The JBOSS AS is an open-source java EE-based application server, which contains a built-in version of TomCat as the web-server. JBOSS server operates cross-platform: usable on any operating system that supports Java.

The JBOSS server in use by eTB Manager is not the same available for downloading in the jboss.org site, instead, it was tuned to run eTB Manager with small modifications in its configuration files and updating of some libraries.

The same version of JBOSS AS in use for production is also used for development, since there is no specific development issue regarding the application server itself. The JBOSS AS for eTB Manager can be downloaded at http://www.etbmanager.org/download/jboss.4.2.3.ga.zip

Once you download JBOSS AS, follow the instructions bellow:

1. Extract the zip file to a folder where the JBOSS AS will be installed;
2. In the JBOSS AS folder, go to server/default/deploy/MSH and remove the files
    - etbmanager-ds.xml
    - etbmanager-service.xml

Database Server

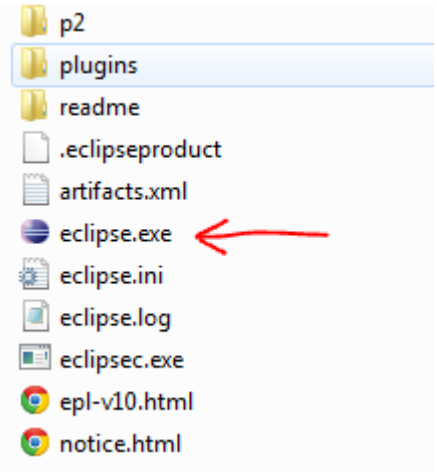
eTB Manager stores all its data in a MySQL database server, currently using version 5 or higher, with InnoDB database engine and UTF-8 character set.

Downloading and Installing Eclipse

Go to the Download area of the Eclipse site (www.eclipse.org) and download the latest version of the Eclipse for Java EE Developers for your operating system.

Although this document is teaching how to setup the environment for a Windows operating system, almost similar procedures may be done to setup the environment to other operating systems like Linux, Unix, OS-X, etc.

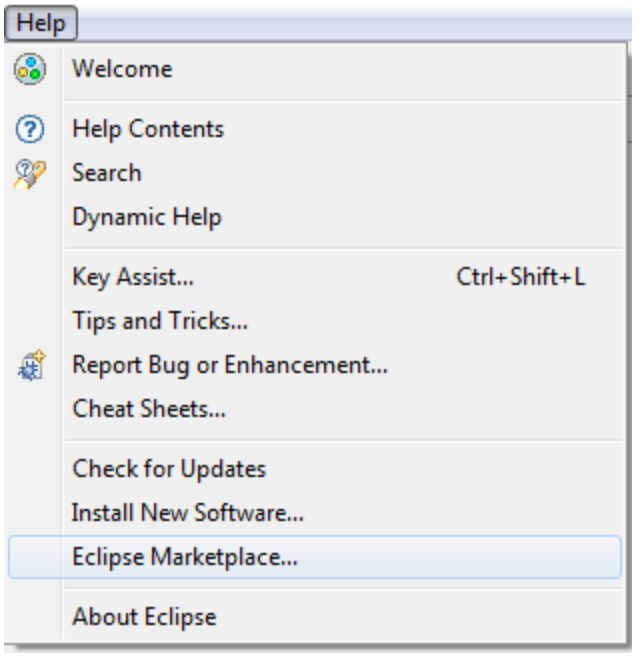
After download, choose a folder in your computer and unzip the whole package there. When it's done, go to the eclipse folder and runs the eclipse.exe



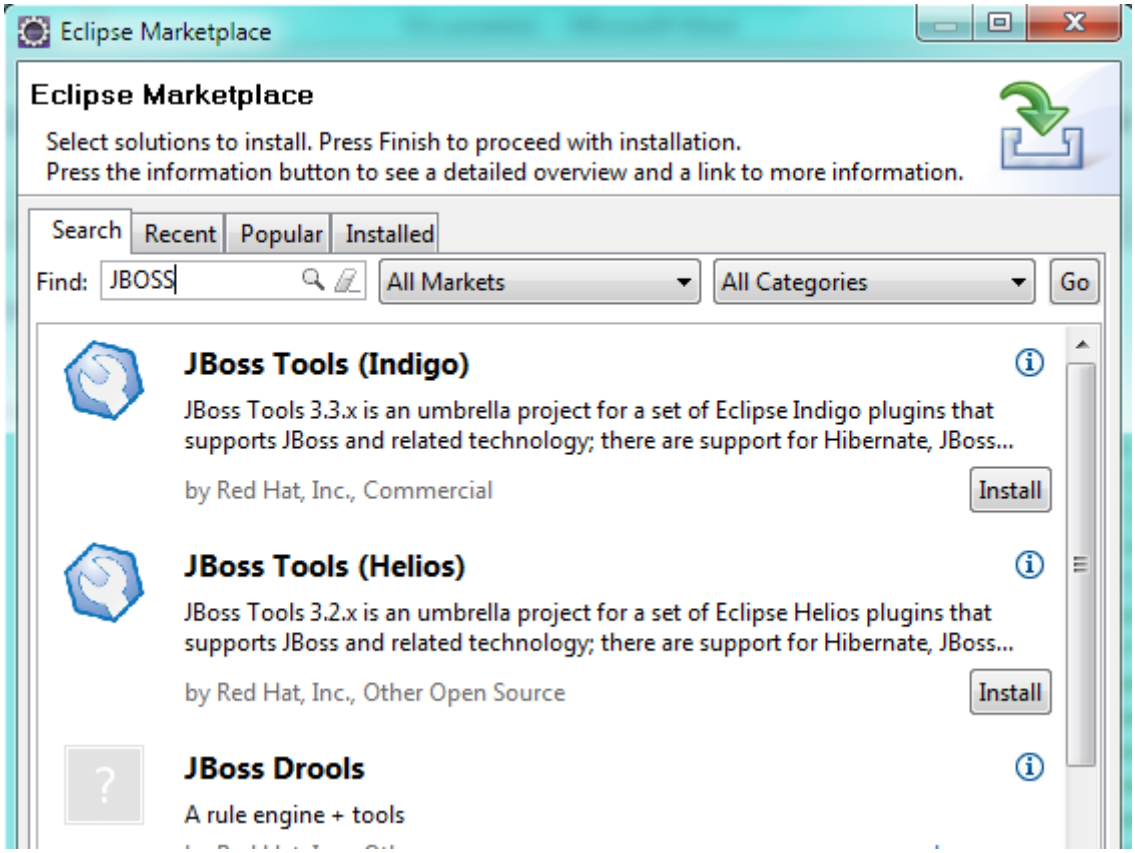
PS.: Once you'll run Eclipse several times, it's recommended to create a link in your desktop pointing to the Eclipse executable file.

Installing JBOSS Tools plugin

Now it's time to install the JBOSS tools plugin. To do that, go to the new Marketplace available in this new version of Eclipse clicking on the help menu.



And in the find box, type JBOSS and install the JBOSS Tool according to the version of Eclipse you've just downloaded.

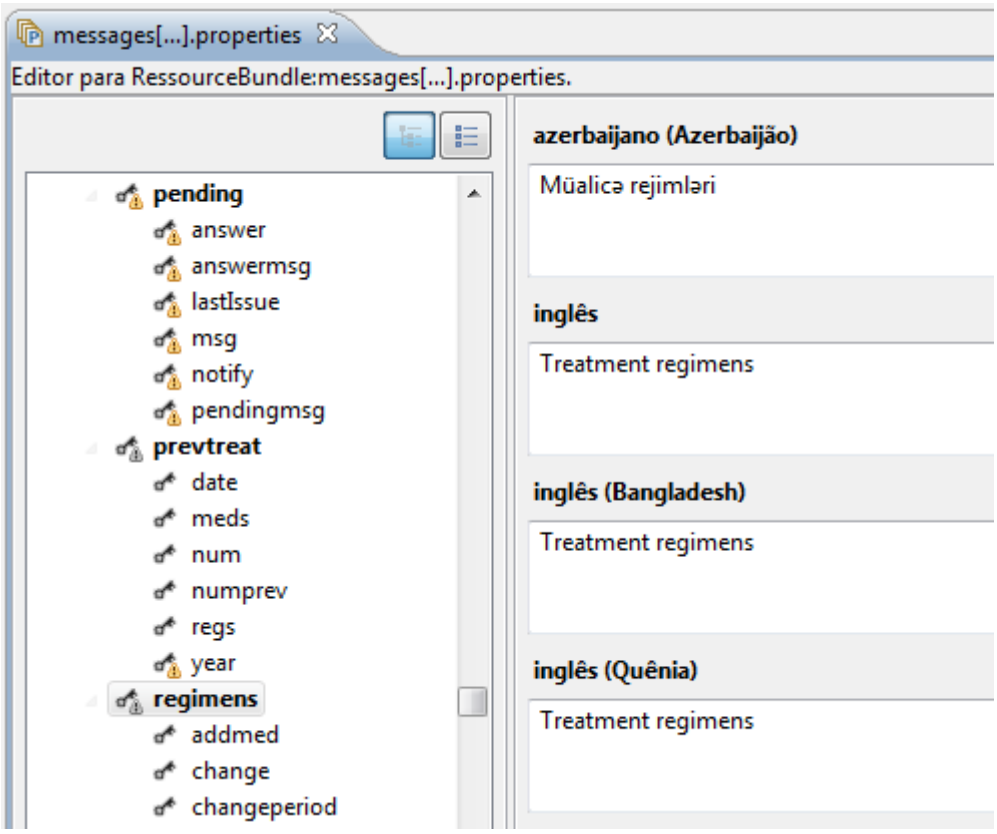


Installing the Resource Bundle Editor

The Resource Bundle Editor allows you to manage and edit localized property files from different languages in just one screen. It's installation is done in the "old way" – You must download the plugin and manually install it inside the plugin folder of the Eclipse package.

1. Go to http://sourceforge.net/projects/eclipse-rbe/
2. Download the latest version of the Resource Bundle Editor;
3. Close the Eclipse (if it's running)
4. Unzip the file into the Eclipse folder;
5. Run Eclipse again;

Now, when opening a property file, you may see something similar to the image bellow:

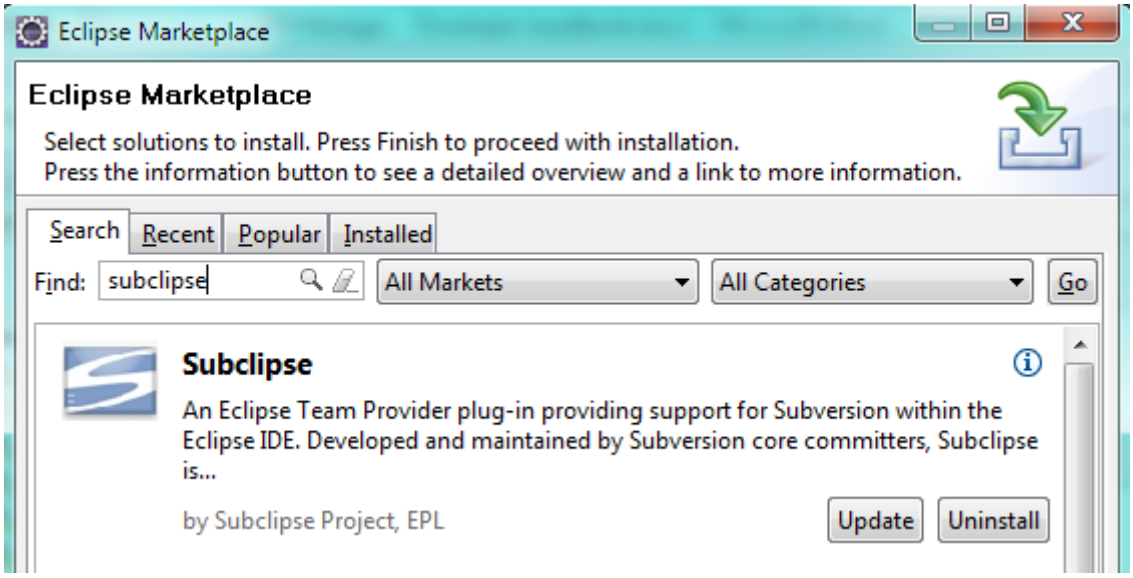


Installing SVN Plugin

With the SVN plugin, you'll be able to connect to the eTB Manager SVN server and check out the latest source code in use by the eTB Manager IT team.

To install the SVN plugin, go to the menu help | Eclipse marketplace and in the search box, type

```
Subclipse
```

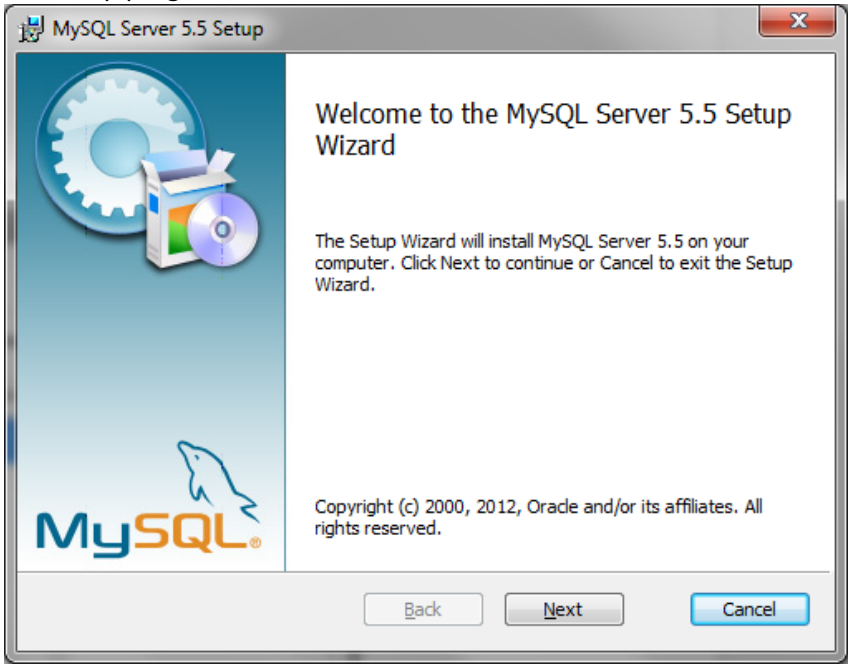


Most probably, the first option is the Subclipse plugin to be installed. Click on the "Install" button to perform with the installation.

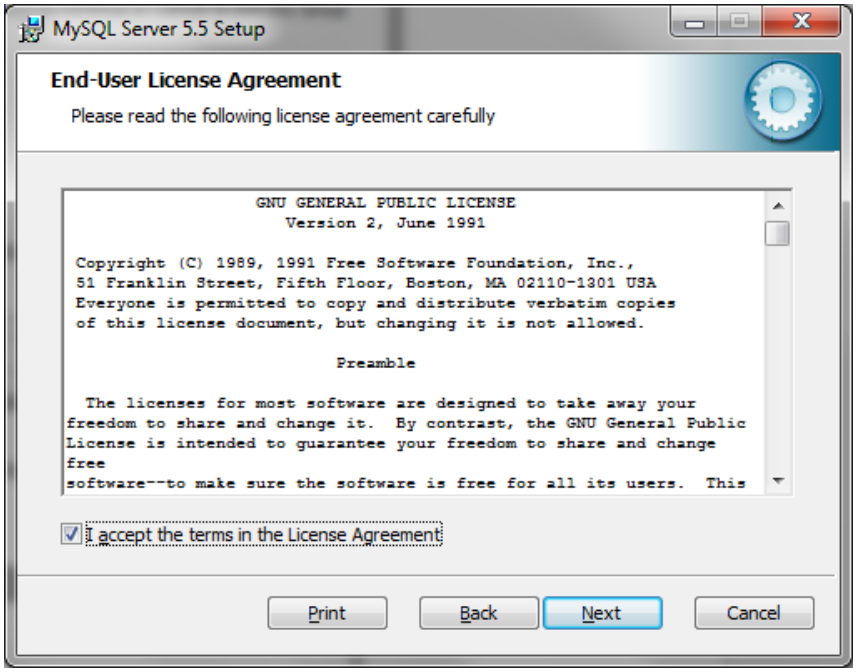
Installing MySQL

The installation instructions bellow consider that you downloaded the installation package for MySQL version 5.5:

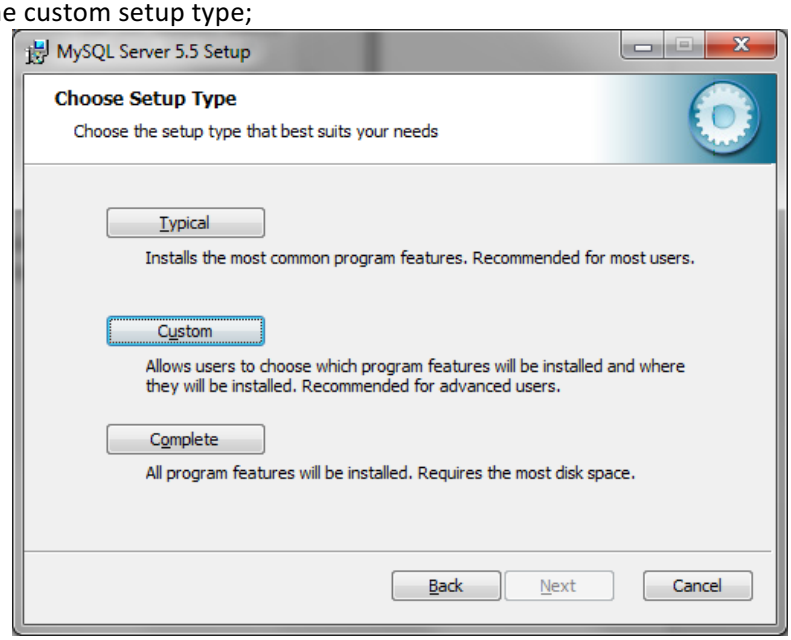
1. Run the setup program you downloaded from the MySQL site. For Windows version, this file is called mysql-5.5.<version>-winx62.msi. You'll see the image bellow when you run the setup program;



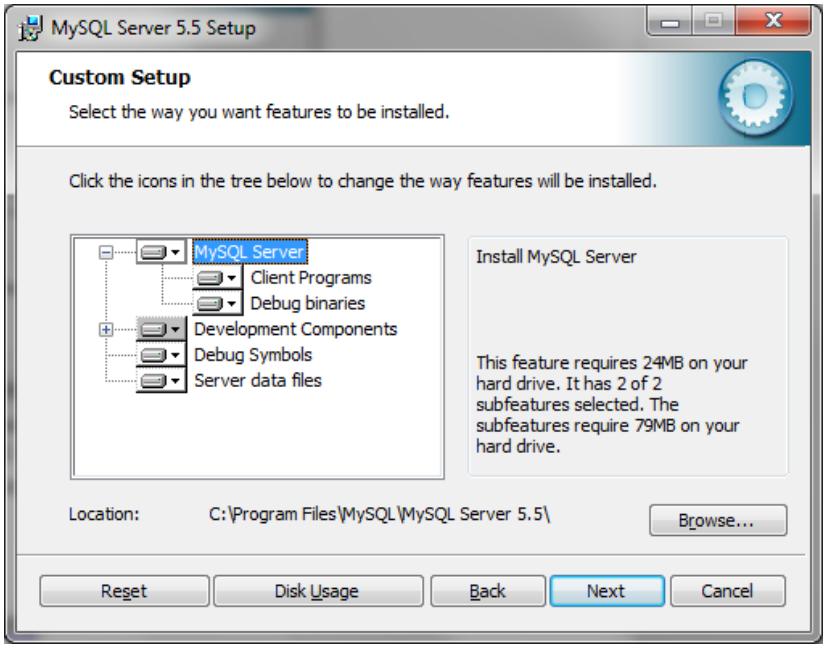
2. Click on the Next button and accept the End-User License Agreement;



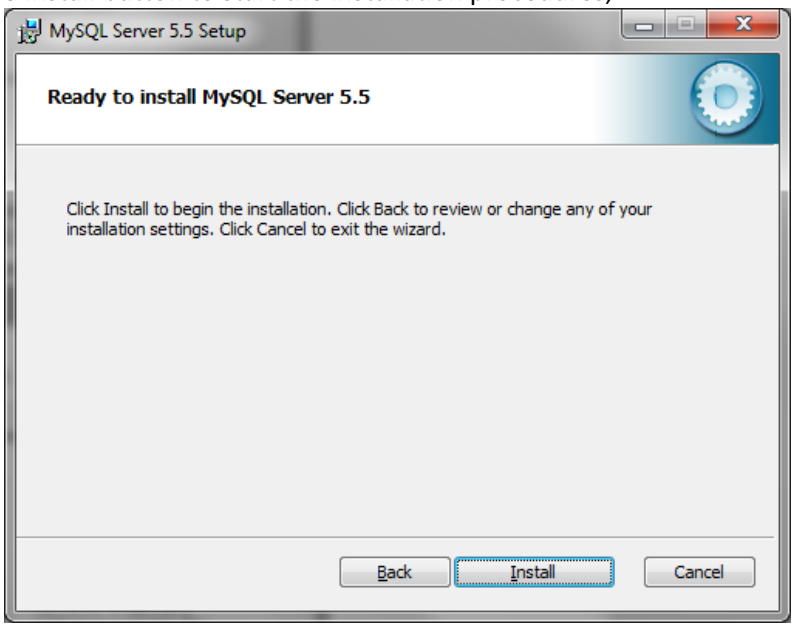
3. Because we want to make sure some features will be properly configured in MySQL, click on the custom setup type;



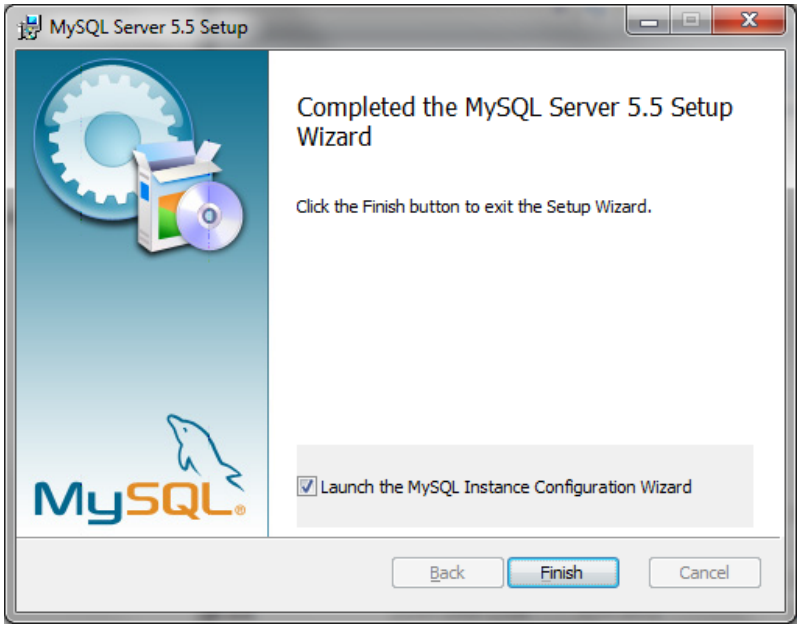
4. Select the location where you want MySQL to be installed, or, if the suggested location is fine, just click on the next button;



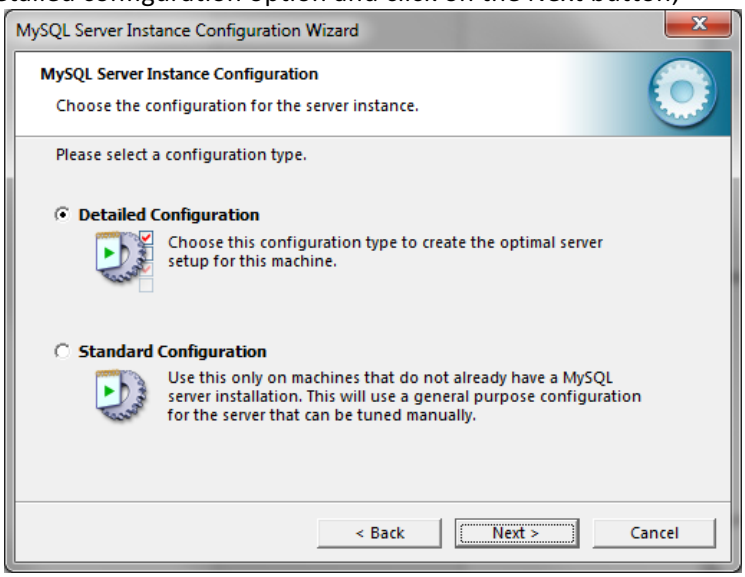
5. Click on the Install button to start the installation procedures;



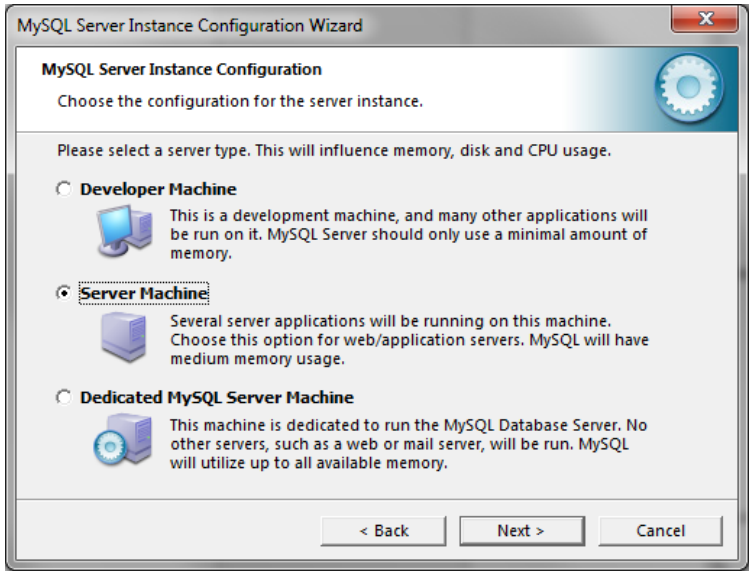
6. When the installation is done, you will see the screen below to launch the MySQL configuration wizard. Click on the finish button;



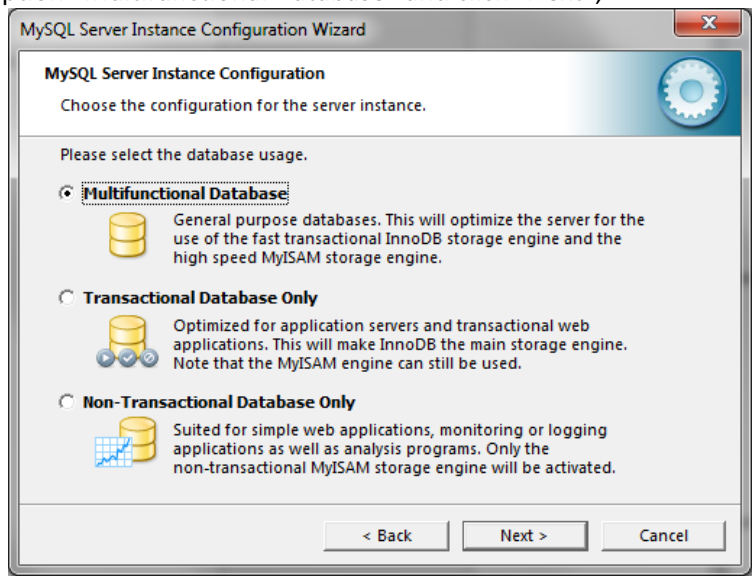
7. Select the instance of the MySQL server and click on the Next button;
8. Select the detailed configuration option and click on the Next button;



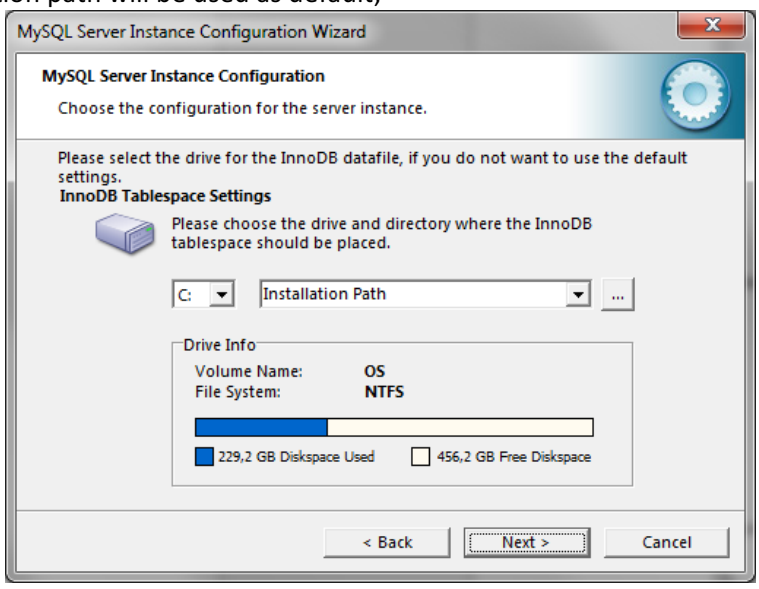
9. On the configuration of the server instance, select “Server Machine” and click “Next”;



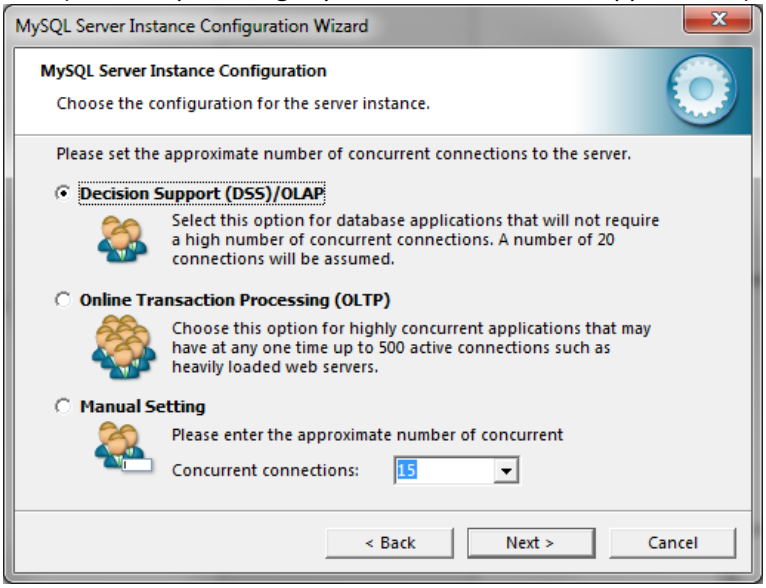
10. Select the option “Multifunctional Database” and click “Next”;



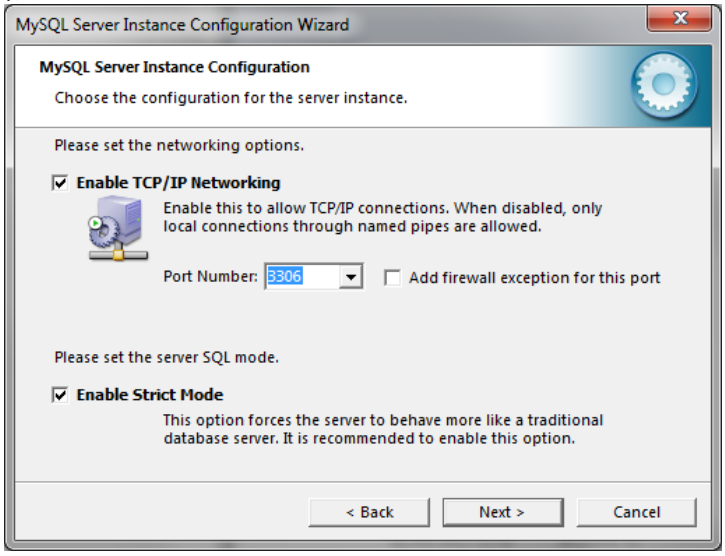
11. Select the folder where you want the MySQL data to be stored. If no folder is selected, the installation path will be used as default;



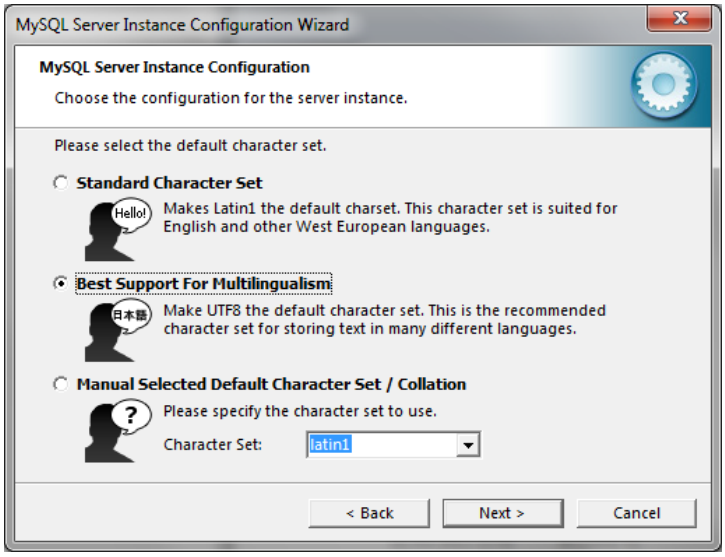
12. The next session you will inform the approximate number of concurrent connections for your instance of MySQL. For eTB Manager the default configuration of 20 connections is more than enough, but change it if you think it'll be necessary for your database server (for example, using MySQL server with other applications);



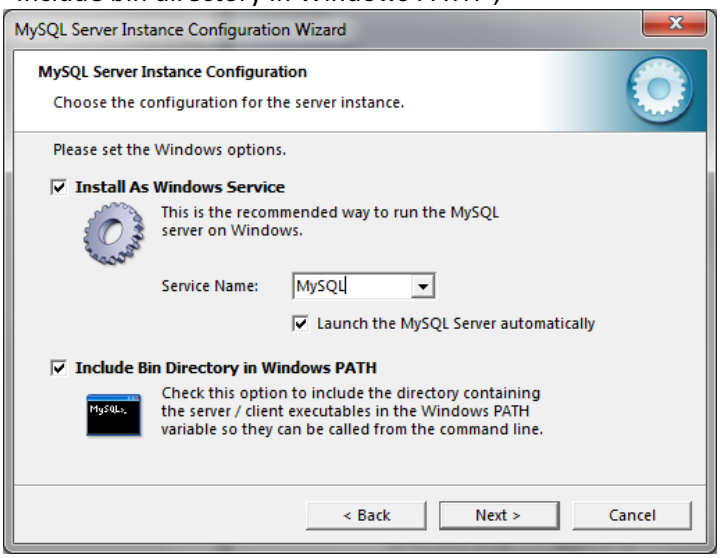
13. Use the default port for TCP/IP networking (unless you have an specific reason to use a different port);



14. In the character settings, select "Best support for Multilingualism";



15. Select the option to install it as a Windows Service and, for easier maintenance, select the option to “Include bin directory in Windows PATH”;



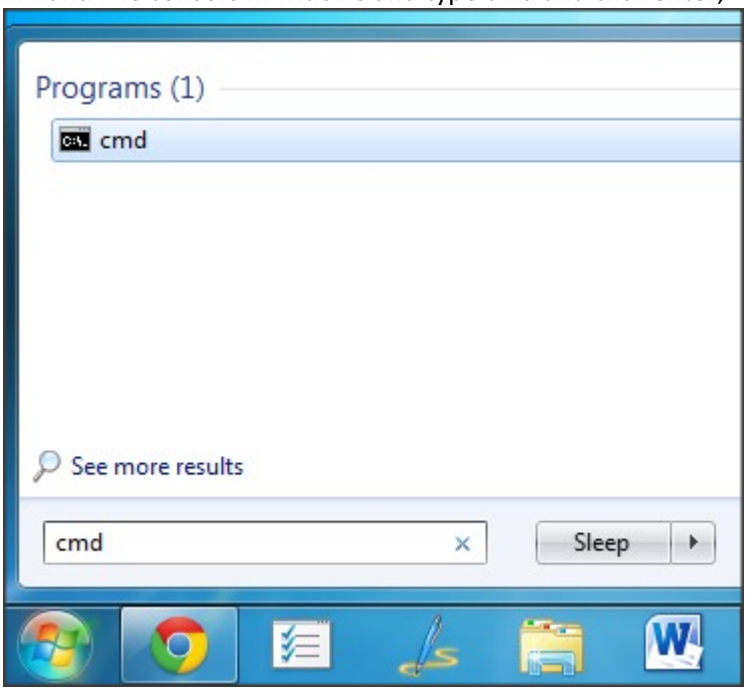
16. Specify a proper password for the root user. Remember this password because it will be necessary to finish installation of eTB Manager;

17. Click on the Execute button and wait for the end of the installation;

Initializing/Restoring eTB Manager Database

In order to initialize eTB Manager database or restoring it from a backup file you'll need a database backup script of eTB Manager. This file usually has the extension .sql.

1. Open the command line console in widows and type cmd and click enter;



2. In the command line window, type the following command

```
mysql –u [username] -p[password] etbmanager <
[etbmanager.bkp.sql]
```

Where:

- *[username]* is the MySQL username. If no username was created in the MySQL server, the root username is the default;
- *[password]* is the password of the given user name;
- *[etbmanager.bkp.sql]* is the full qualified eTB Manager backup file name;

Wait for the creation and restoring of the database. It may take a while depending on the size of the backup file. The program mysql works in silent mode. If no error happens, no message will be displayed and a new database called etbmanager will be created in the MySQL.

Installing Other MySQL Tools

Although it is not a requirement, it is very useful to install the MySQL tools. Searching in the Internet you will find a long list of tools to manage your MySQL instance. You will find both free and commercial tools. Just pick the one that you feel more comfortable with.

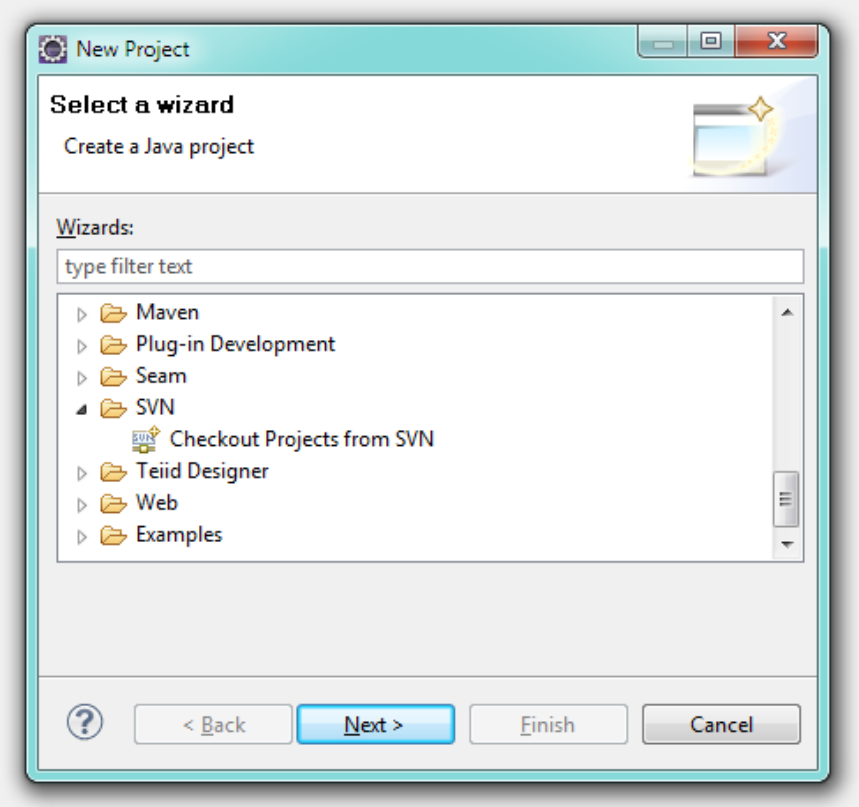
One good tool is the **MySQL Workbench**, which is available in the MySQL site. It contains everything necessary for any developer to manage its local instance of MySQL. The MySQL Workbench is available at http://www.mysql.com/downloads/workbench/

6. Configuring the Eclipse IDE

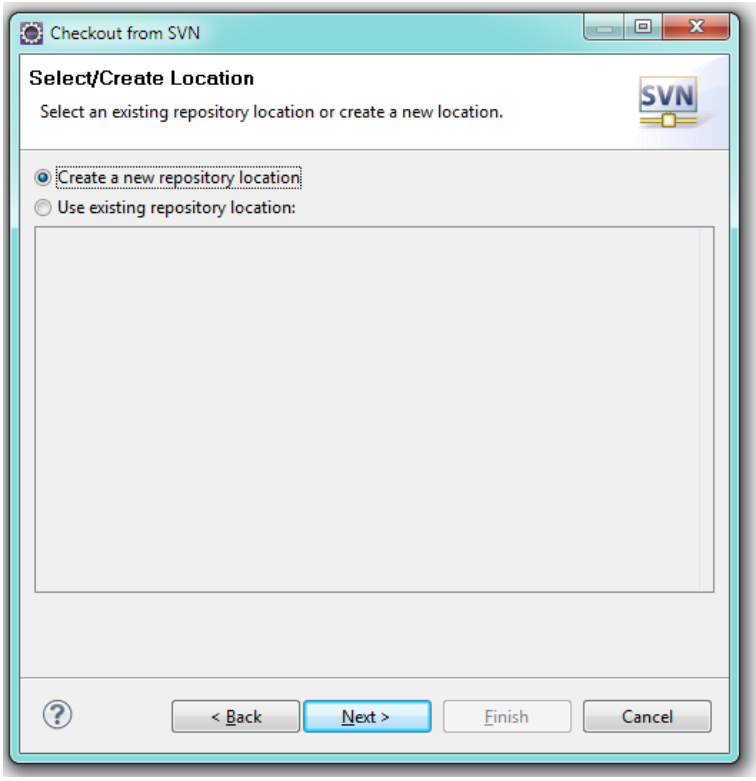
Downloading the Source Code

In order to download the source code, you'll have to use the SVN plugin available in the Eclipse IDE (described above). Follow the instructions bellow to get the source code from the eTB Manager SVN server:

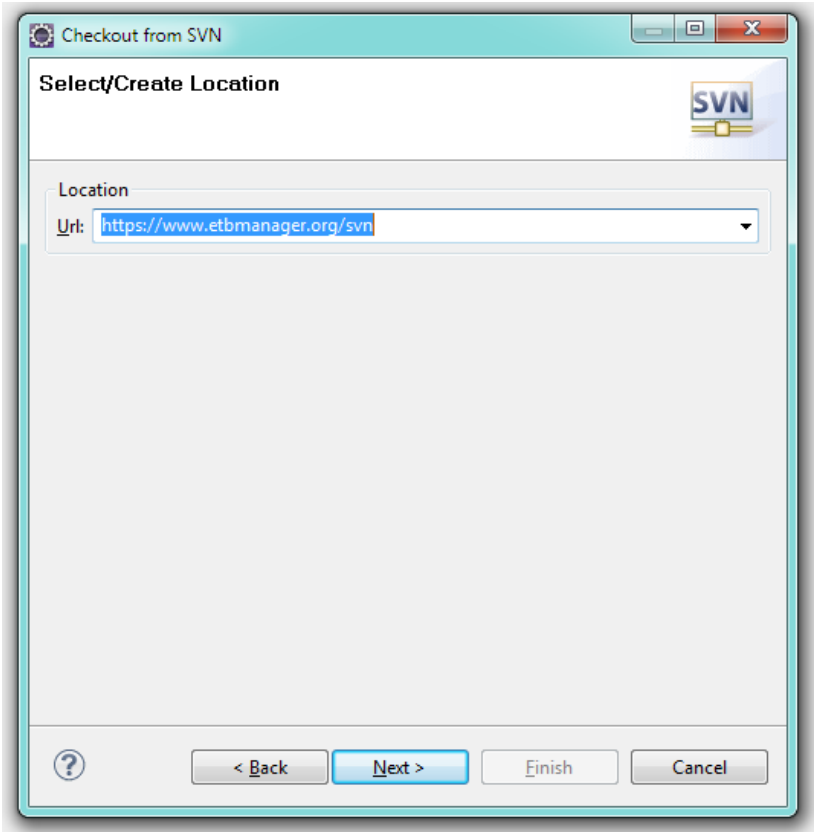
1. In Eclipse, go to the menu File | New | Project …
2. Select the option SVN | Checkout project from SVN



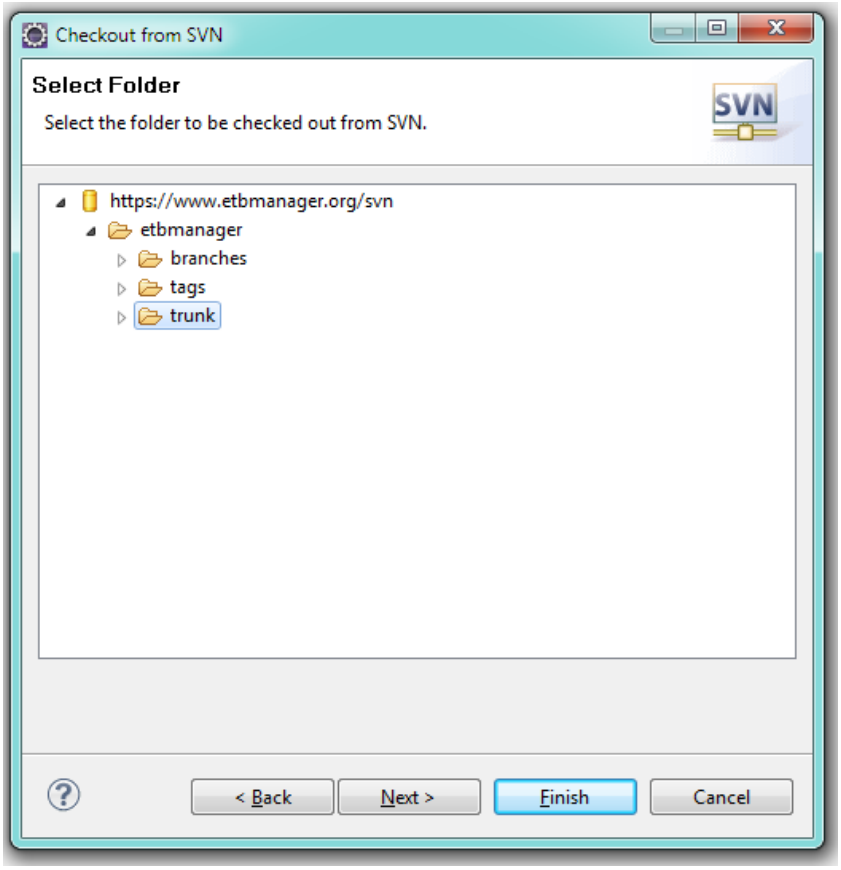
3. If repository was not configured, click on the option "Create a new repository location";



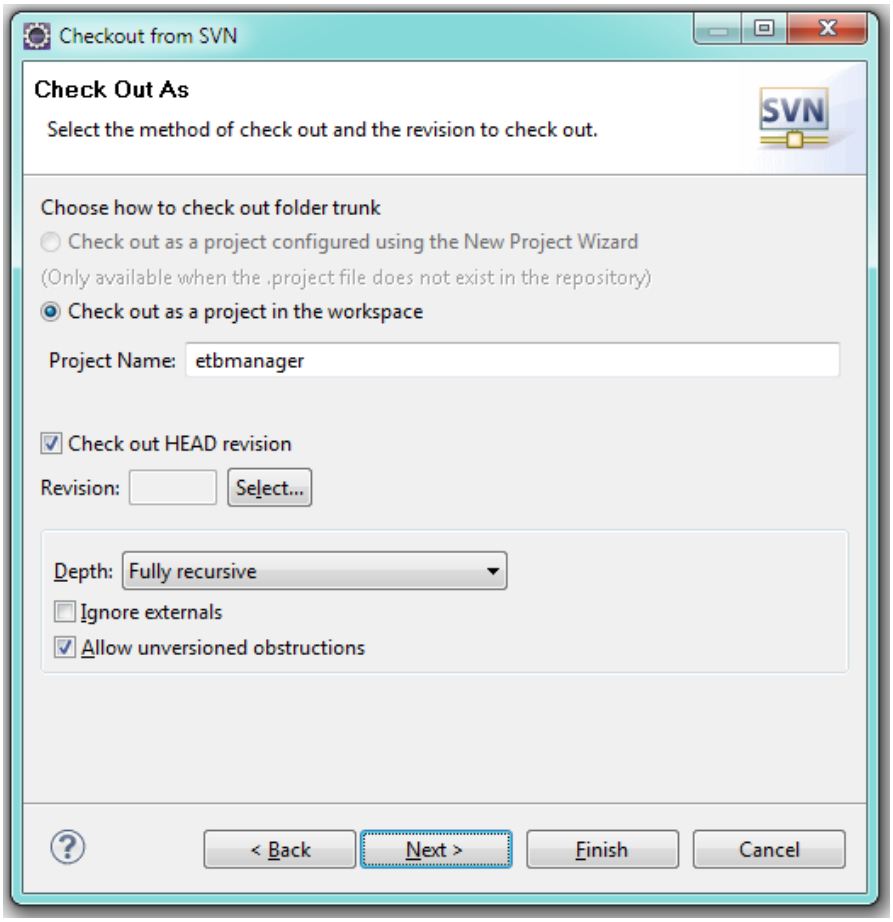
4. In the URL, type the URL of the SVN server https://www.etbmanager.org/svn;



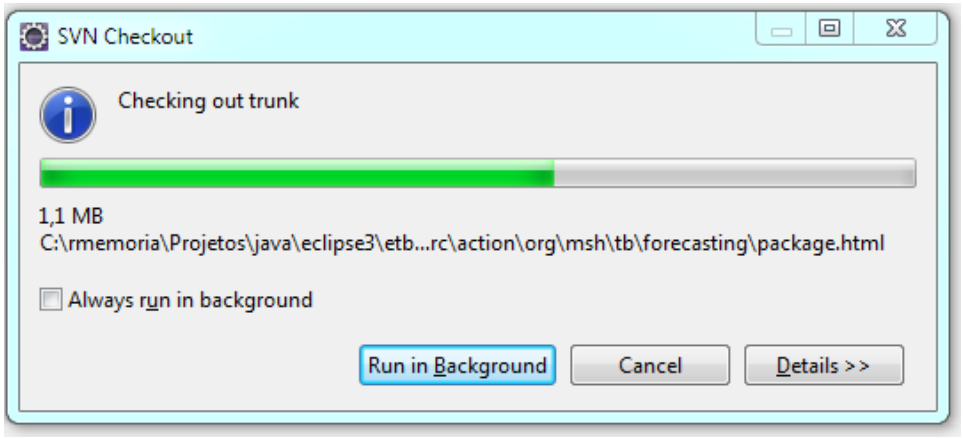
5. Enter your user name and password to be authenticated by the SVN server (If you don't have one, request one to MSH);
6. Eclipse will ask you about the location of the root source code in the SVN Repository. Select the path etbmanager/trunk;



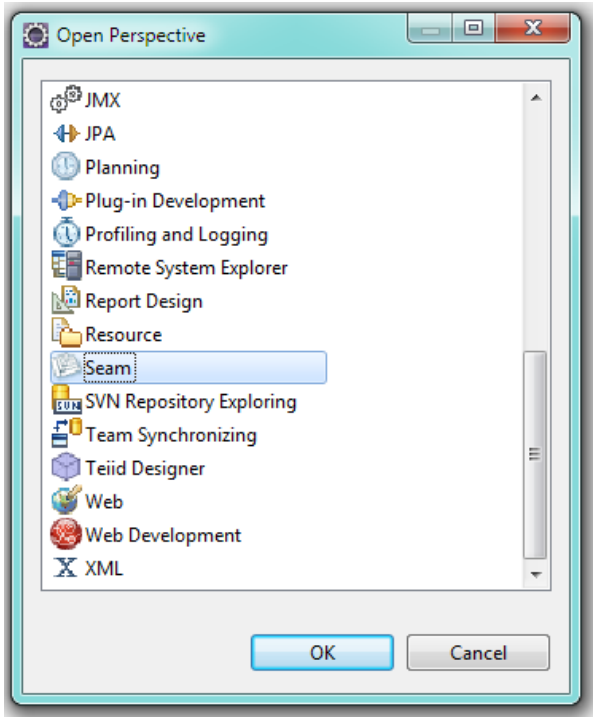
7. Check if all information is correct and click on the finish button;



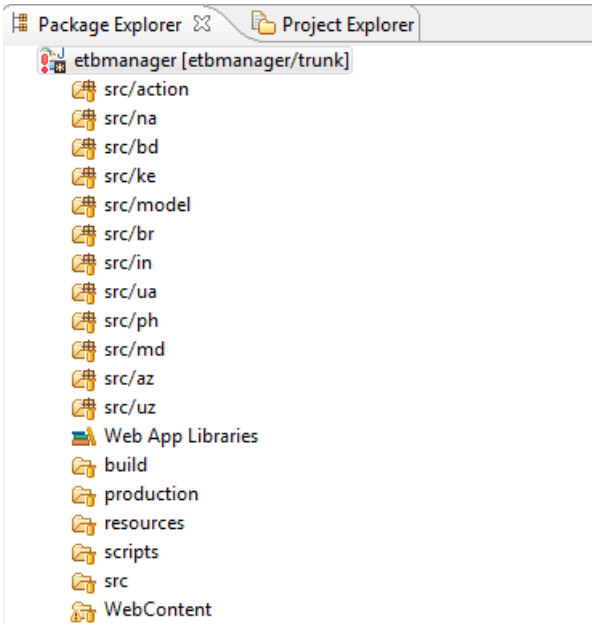
8. Eclipse will create a new project called etbmanager and will start downloading the project source code (this operation may take a while);



9. When the check out procedure is finished, the latest etbmanager source code will be available as an Eclipse Project;
10. For a better view of the files in the project structure, select the SEAM perspective. To do that, go to the menu Window | Open perspective | Other, and select Seam;



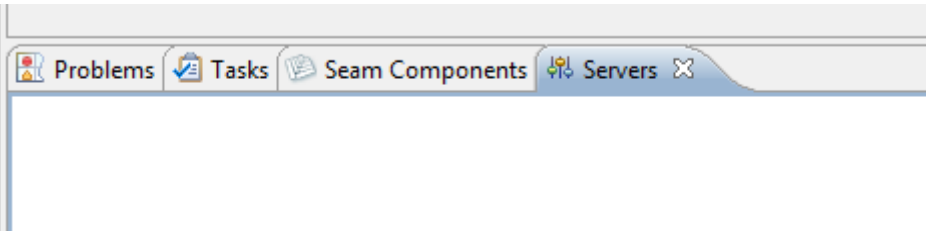
11. So after that you'll be able to see the source code tree in the Seam perspective;



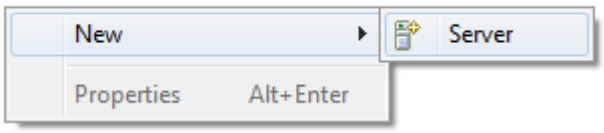
Configuring the JBOSS Server

In order to run and test the system, you must configure the JBOSS server in the Eclipse IDE. To do that, follow the steps bellow:

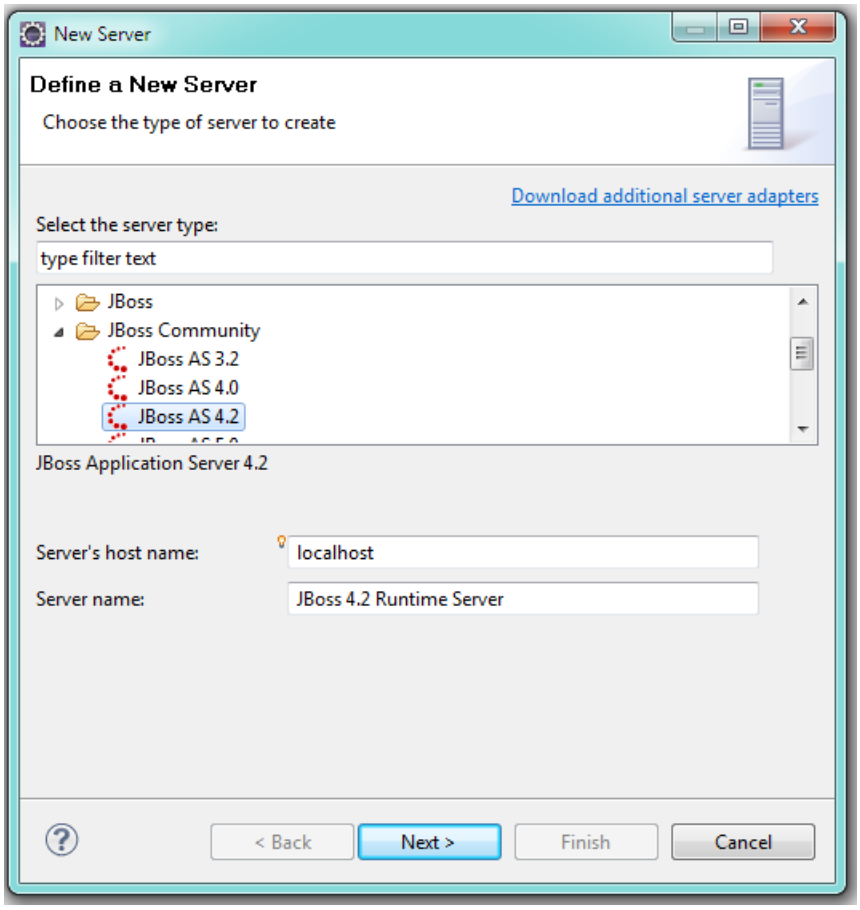
1. Go to the servers tab at the bottom of the screen (if it's not available, go to the menu Windows | Show View | Others and select Server > Servers);



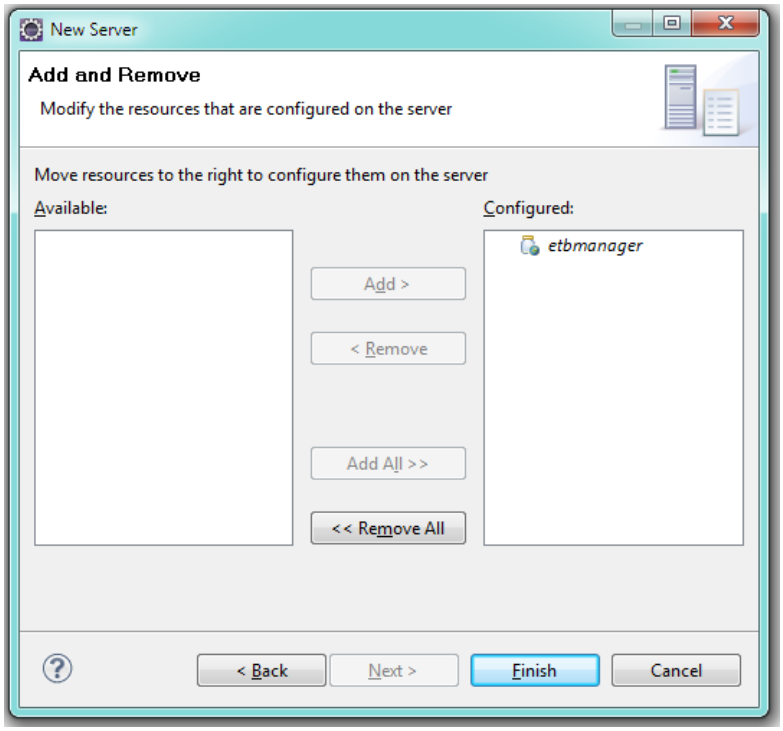
2. Right click on the Servers panel and select the option New -> Server



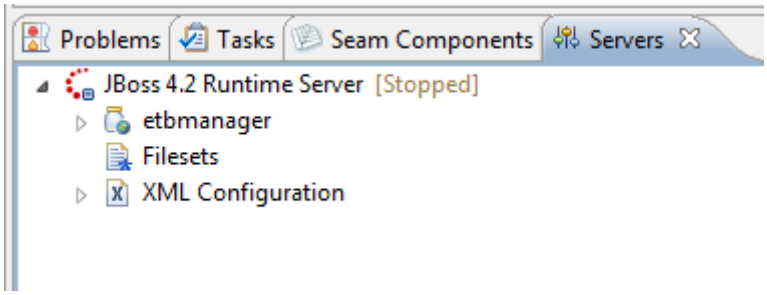
3. From the list of servers, select the JBoss Community -> JBOSS AS 4.2 server



4. Click the Next button until the last page;
5. Include the etbmanager project in the list of Configured projects;



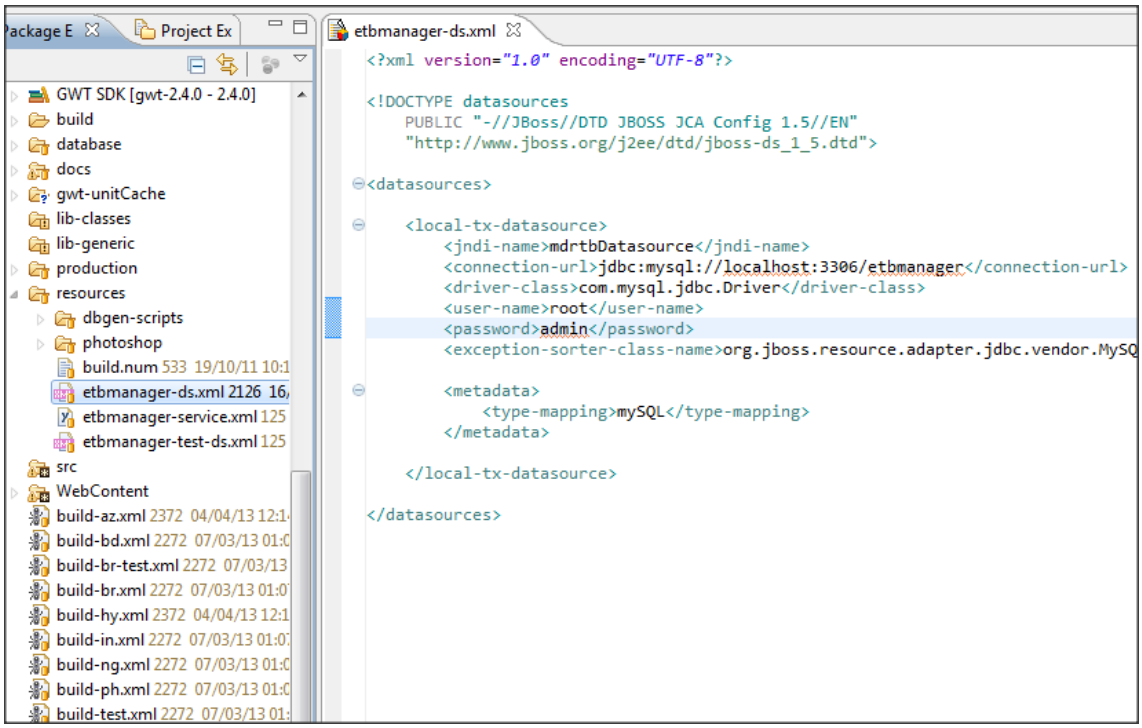
6. Click on the finish button and notice that JBOSS AS server is configured with the project etbmanager;



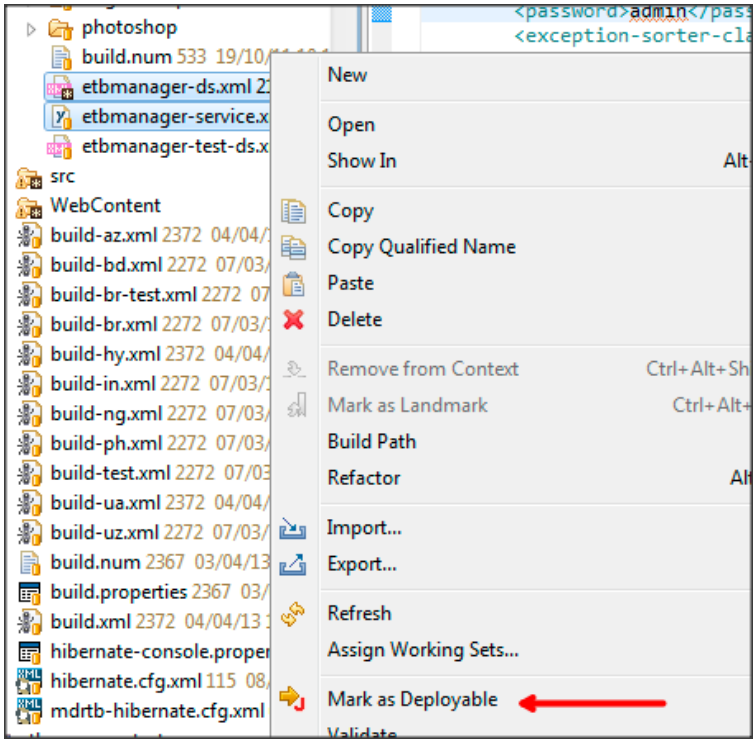
Running eTB Manager

In order to run eTB Manager you will have to configure the database connection and the mail server connection. This last one is optional and you will have to configure just if you want eTB Manager to send mail messages in the development environment.

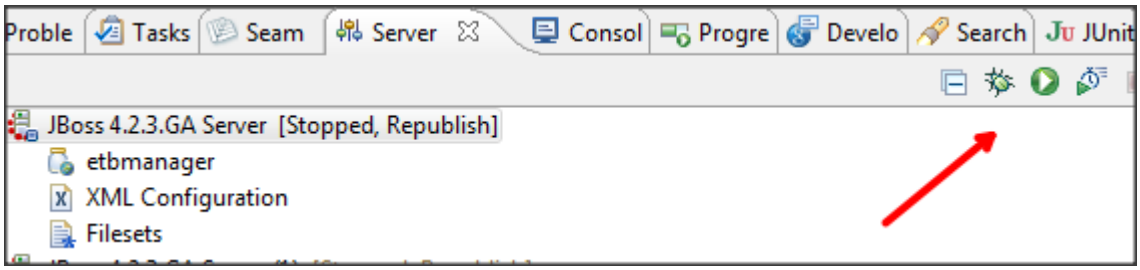
1. In etbmanager project inside the Eclipse IDE, open to the file resources/etbmanager-ds.xml;



2. This is the file used by eTB Manager to get a connection to the database server. Update the information about database connection and save it;
3. Now you have to configure the mail server connection. Open the file resources/etbmanager-service.xml;
4. Update the information about the mail server. When it is done, save it;
5. Now you have to tell Eclipse to deploy these two files when the application runs. To do that, select both files etbmanager-ds.xml and etbmanager-service.xml and right click with the mouse;



6. Select the JBOSS instance you registered in Eclipse and confirm the operation by clicking on the OK button;
7. Now go to the Server tab, select your JBOSS server and click the Run button (or the Debug button, if you want to start it in debugging mode);



8. Wait for the completion of the JBOSS execution and completion (it may take a while, depending on your computer processor and memory available);
9. If JBOSS start-up finished with no error (check the console window), them go to your browser and type:

   http://localhost:8080/etbmanager

10. You may see the login page of eTB Manager. So it's done;