



**POLITECNICO
DI MILANO**

Installation manual (with Windows Server 2012 R2 OS examples)

MeteoCal

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Manuel Grillo
Francesco Fermi
Jerry M. Jude

0. Index

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The opinions expressed in this document are those of the authors, and do not necessarily reflect the opinions of the mebers of the Politecnico di Milano university.

1. Introduction

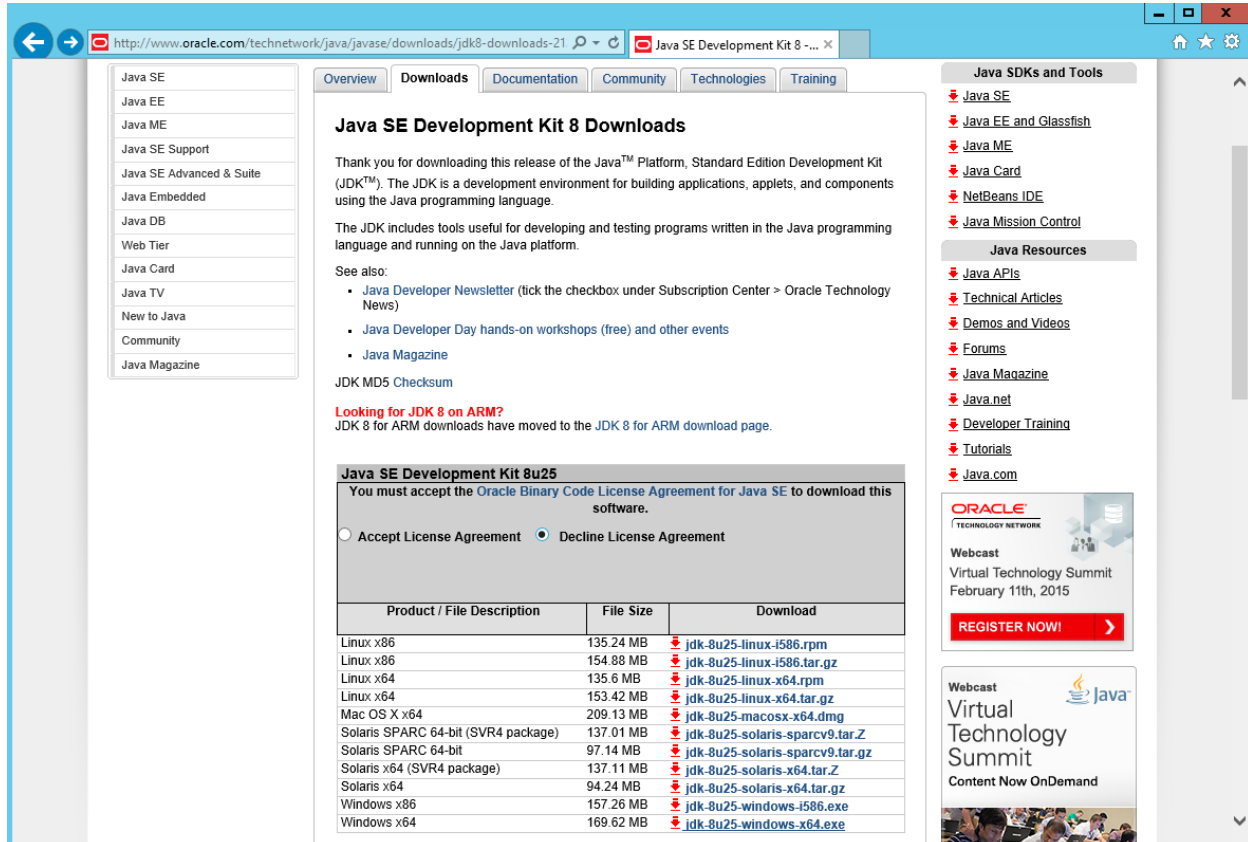
MeteoCal beta is a web application developed in Java EE 7 for the GlassFish application server and it exploits a MySQL database to store data. If you are using a server operating system, you probably want to whitelist the sites listed in *Appendix A – Secure links for sever Oss*. Please, also remember that the server must be connected to the internet.

2. Getting started

2.1. Make sure JDK 8 is installed

Java EE 7 requires JDK 7 (or above) as it make use of some of the latest SE 7 features. For GlassFish 4.1 and – thus – for MeteoCal beta, we recommend to have JDK 8 Build 20 (or above) installed (full JDK, not just JRE). The Java SE Development Kit 8 can be downloaded here:

<http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>



Java SE Development Kit 8 Downloads

Thank you for downloading this release of the Java™ Platform, Standard Edition Development Kit (JDK™). The JDK is a development environment for building applications, applets, and components using the Java programming language.

The JDK includes tools useful for developing and testing programs written in the Java programming language and running on the Java platform.

See also:

- [Java Developer Newsletter](#) (tick the checkbox under Subscription Center > Oracle Technology News)
- [Java Developer Day hands-on workshops](#) (free) and other events
- [Java Magazine](#)

JDK MD5 Checksum

Looking for JDK 8 on ARM?
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Java SE Development Kit 8u25

You must accept the [Oracle Binary Code License Agreement for Java SE](#) to download this software.

☐ Accept License Agreement ☒ Decline License Agreement

Product / File Description	File Size	Download
Linux x86	135.24 MB	jdk-8u25-linux-i586.rpm
Linux x86	154.88 MB	jdk-8u25-linux-i586.tar.gz
Linux x64	135.6 MB	jdk-8u25-linux-x64.rpm
Linux x64	153.42 MB	jdk-8u25-linux-x64.tar.gz
Mac OS X x64	209.13 MB	jdk-8u25-macosx-x64.dmg
Solaris SPARC 64-bit (SVR4 package)	137.01 MB	jdk-8u25-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	97.14 MB	jdk-8u25-solaris-sparcv9.tar.gz
Solaris x64 (SVR4 package)	137.11 MB	jdk-8u25-solaris-x64.tar.Z
Solaris x64	94.24 MB	jdk-8u25-solaris-x64.tar.gz
Windows x86	157.26 MB	jdk-8u25-windows-i586.exe
Windows x64	169.62 MB	jdk-8u25-windows-x64.exe

Figure 1 - Java SE Development Kit 8 Downloads.

Problems are likely to arise if you attempt to install on a platform that is not supported or on a system that in some other way does not meet release requirements. Install the correct version of the JDK depending on your system (x86/32-bit or x64/64-bit) and your operating system (Windows, Linux or OS X).

For Mac OS X systems, GlassFish Server uses the JDK that is part of the Macintosh operating system. If necessary, obtain the required JDK version from the Mac OS X Updates site:

<http://support.apple.com/downloads/>

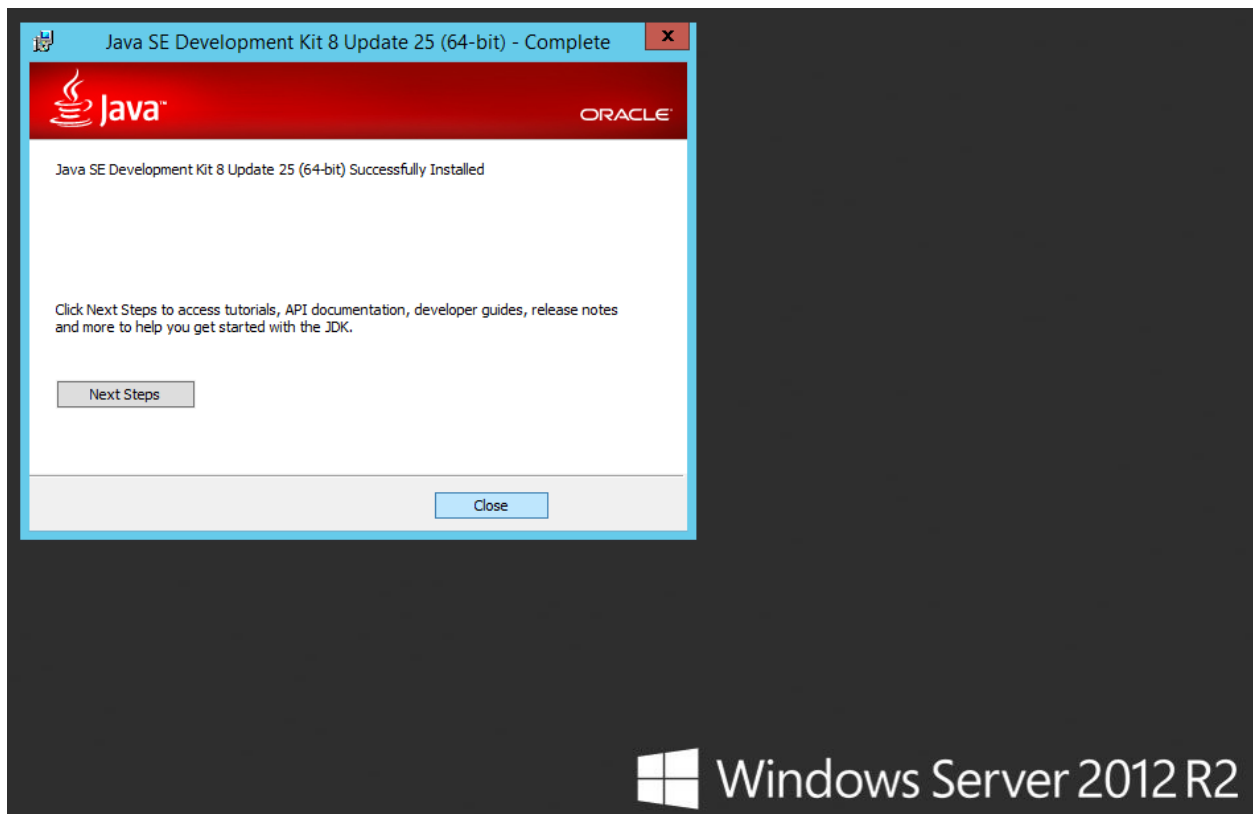


Figure 2 - JDK successfully installed.

GlassFish is also part of the Java EE SDK distributions. The SDK distributions are available from the Java EE downloads page:

<http://www.oracle.com/technetwork/java/javaee/downloads/index.html>

2.2. Download GlassFish

You can download GlassFish 4.1 Full Platform from the GlassFish Server Open Source Edition 4.1 download page:

<https://glassfish.java.net/download.html>

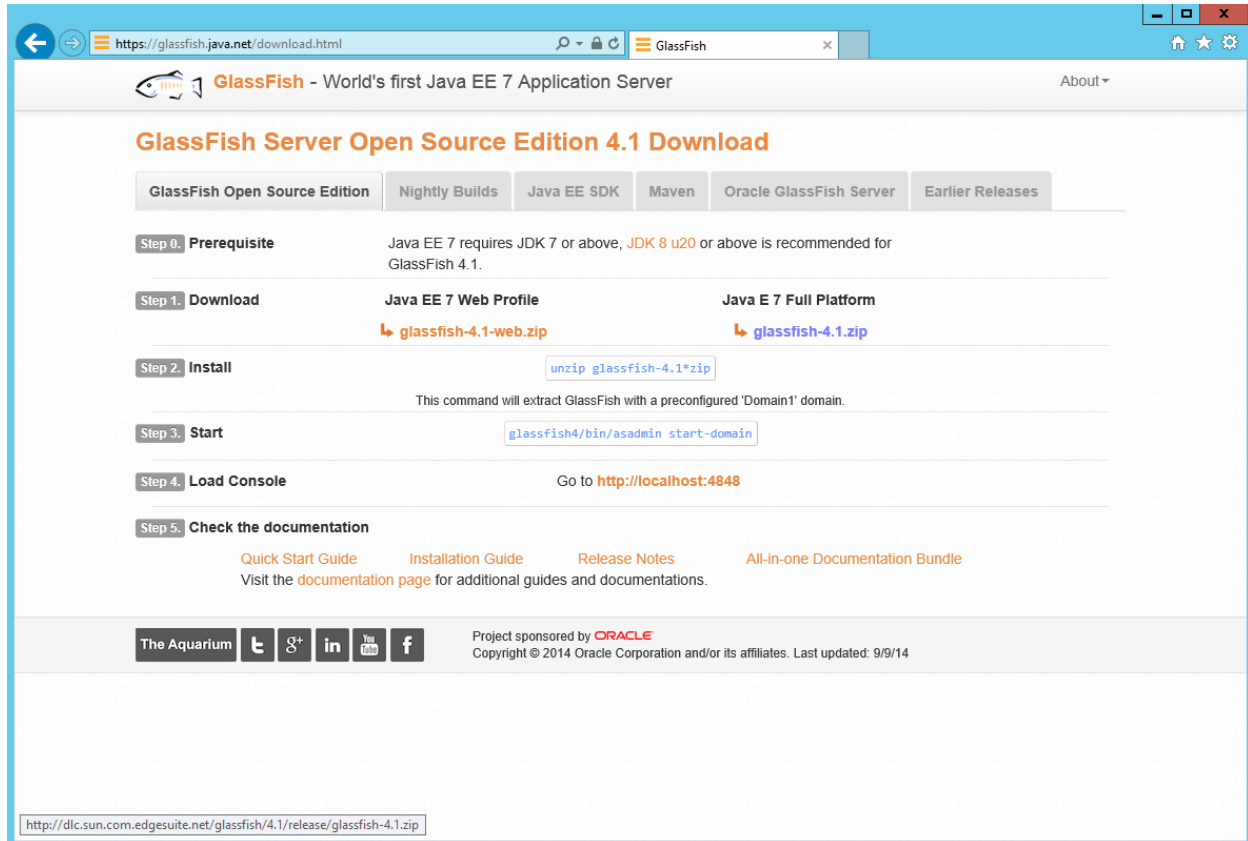


Figure 3 - GlassFish Server Open Source Edition 4.1 Download.

It is compatible with Solaris, Linux, Mac OS and Windows operating systems.

2.3. Install GlassFish

GlassFish Server is installed by unzipping the file in the installation directory of your choice: just extract the ZIP file in the directory where you want to have GlassFish installed (e.g. C:\).

Since it is not possible to specify any GlassFish Server configuration options during a ZIP file installation, by default, GlassFish is configured with one domain called domain1 which uses port 8080 for HTTP, port 8181 for HTTPS and port 4848 for administration. Any configuration changes must be made manually after installation (please see *Section 3.3 – Configure GlassFish*).

GlassFish Server is installed into a new glassfish4 directory under your current directory (e.g. C:\glassfish4).

2.4. Start GlassFish

To start GlassFish Server from the command line (e.g. Windows PowerShell), open a terminal window or command prompt and invoke, from the GlassFish directory, the following command:

```
glassfish4/bin/asadmin start-domain -verbose
```

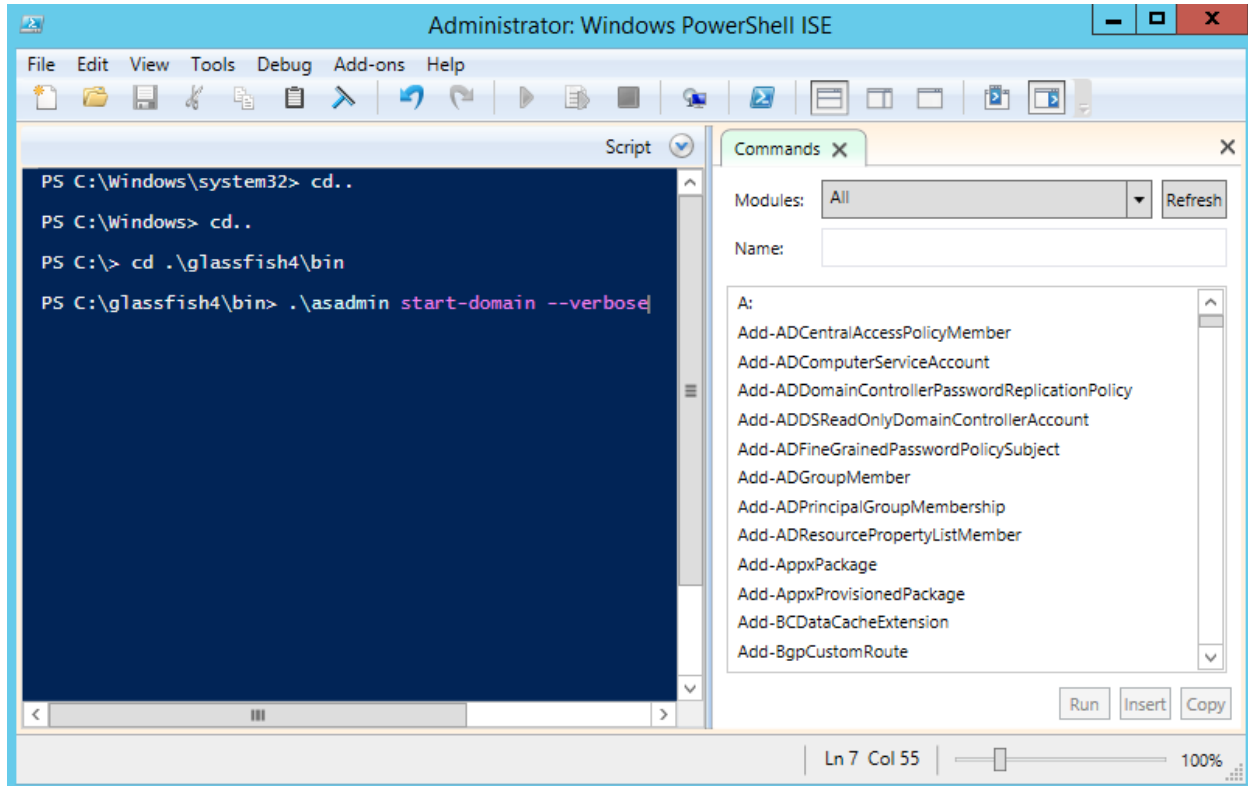


Figure 4 - Command to start the GlassFish server.

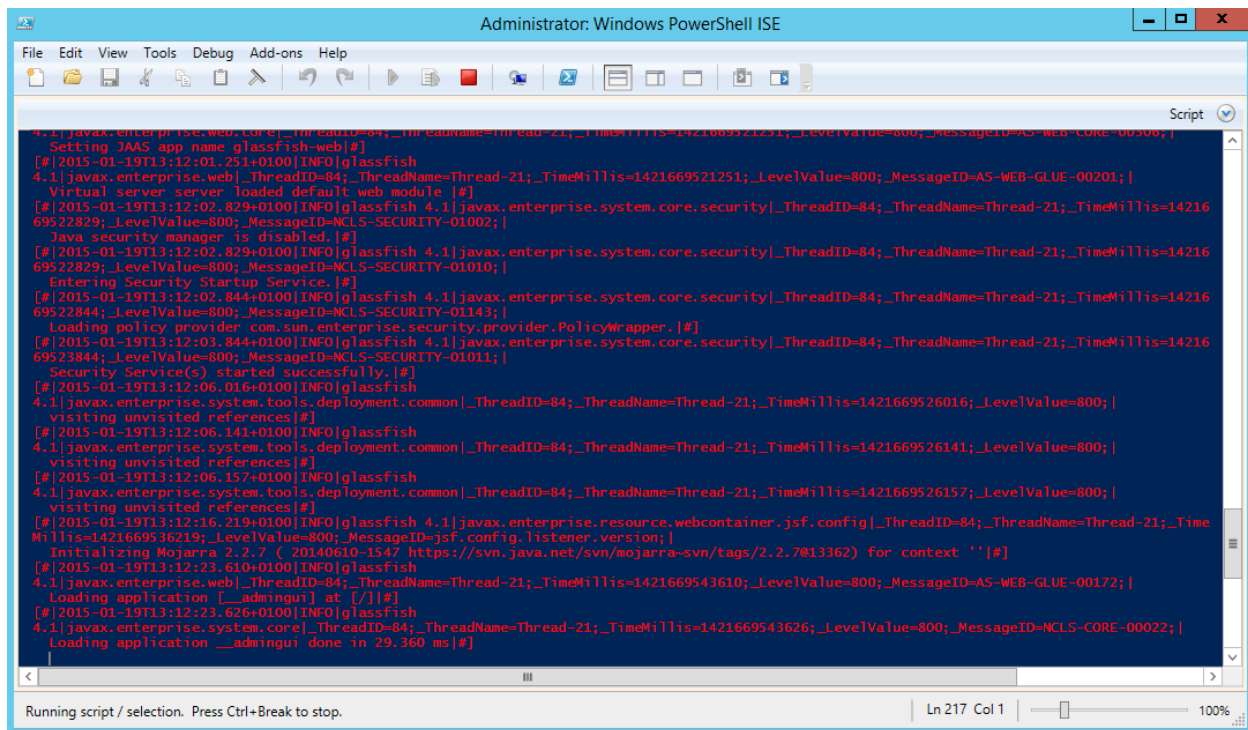
Note that, since you only have one domain (i.e. a set of one or more GlassFish Server instances managed by one administration server) configured, there is no need to mention which domain to start.

With no arguments, the start-domain command initiates the default domain, which is domain1. The --verbose flag causes all logging and debugging output to appear on the terminal window or command prompt. The output also goes into the server log, which is located in domain-dir/logs/server.log

If the message:

```
Loading application __admingui done
```

is displayed, the server has successfully been started.

The image shows a screenshot of the Windows PowerShell ISE (Integrated Scripting Environment) running as an administrator. The window title is "Administrator: Windows PowerShell ISE". The menu bar includes File, Edit, View, Tools, Debug, Add-ons, and Help. The toolbar contains various icons for file operations and execution. The main text area displays a log of GlassFish startup messages. The log starts with "Setting JAAS app name glassfish-web[#]" and continues with various INFO and DEBUG messages from different Java classes, including javax.enterprise.web, javax.enterprise.system.core.security, and org.glassfish. The log ends with "Loading application __admin__ done in 29.360 ms[#]". The status bar at the bottom indicates "Running script / selection. Press Ctrl+Break to stop." and shows the current position as "Ln 217 Col 1" with a 100% zoom level.

```
4.1|javax.enterprise.web.core|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=1421669521251;_LevelValue=800;_MessageID=AS-WEB-CORE-00200;|
Setting JAAS app name glassfish-web[#]
[#|2015-01-19T13:12:01.251+0100|INFO|glassfish
4.1|javax.enterprise.web|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=1421669521251;_LevelValue=800;_MessageID=AS-WEB-GLUE-00201;|
Virtual server server loaded default web module [#]
[#|2015-01-19T13:12:02.829+0100|INFO|glassfish 4.1|javax.enterprise.system.core.security|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=14216
69522829;_LevelValue=800;_MessageID=NCLS-SECURITY-01002;|
Java security manager is disabled.[#]
[#|2015-01-19T13:12:02.829+0100|INFO|glassfish 4.1|javax.enterprise.system.core.security|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=14216
69522829;_LevelValue=800;_MessageID=NCLS-SECURITY-01010;|
Entering Security Startup Service.[#]
[#|2015-01-19T13:12:02.844+0100|INFO|glassfish 4.1|javax.enterprise.system.core.security|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=14216
69522844;_LevelValue=800;_MessageID=NCLS-SECURITY-01143;|
Loading policy provider com.sun.enterprise.security.provider.PolicyWrapper.[#]
[#|2015-01-19T13:12:03.844+0100|INFO|glassfish 4.1|javax.enterprise.system.core.security|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=14216
69523844;_LevelValue=800;_MessageID=NCLS-SECURITY-01011;|
Security Service(s) started successfully.[#]
4.1|javax.enterprise.system.tools.deployment.common|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=1421669526016;_LevelValue=800;|
visiting unvisited references[#]
[#|2015-01-19T13:12:06.141+0100|INFO|glassfish
4.1|javax.enterprise.system.tools.deployment.common|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=1421669526141;_LevelValue=800;|
visiting unvisited references[#]
[#|2015-01-19T13:12:06.157+0100|INFO|glassfish
4.1|javax.enterprise.system.tools.deployment.common|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=1421669526157;_LevelValue=800;|
visiting unvisited references[#]
[#|2015-01-19T13:12:16.219+0100|INFO|glassfish 4.1|javax.enterprise.resource.webcontainer.jsf.config|_ThreadID=84;_ThreadName=Thread-21;_Time
Millis=1421669536219;_LevelValue=800;_MessageID=jsf.config.listener.version;|
Initializing Mojarra 2.2.7 ( 20140610-1547 https://svn.java.net/svn/mojarra~svn/tags/2.2.7@13362) for context ''[#]
[#|2015-01-19T13:12:23.610+0100|INFO|glassfish
4.1|javax.enterprise.web|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=1421669543610;_LevelValue=800;_MessageID=AS-WEB-GLUE-00172;|
Loading application [ __admin__] at [/][#]
[#|2015-01-19T13:12:23.626+0100|INFO|glassfish
4.1|javax.enterprise.system.core|_ThreadID=84;_ThreadName=Thread-21;_TimeMillis=1421669543626;_LevelValue=800;_MessageID=NCLS-CORE-00022;|
Loading application __admin__ done in 29.360 ms[#]
```

Figure 5 - GlassFish has been successfully loaded.

To stop GlassFish, open a terminal window or command prompt and execute the command:

```
glassfish4/bin/asadamin stop-domain domain1
```


2.5. Install MySQL Community Server

To complete the installation we have to install the database server that MeteoCal beta will use. We use a MySQL database. A free version of the Community Server is available here:

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

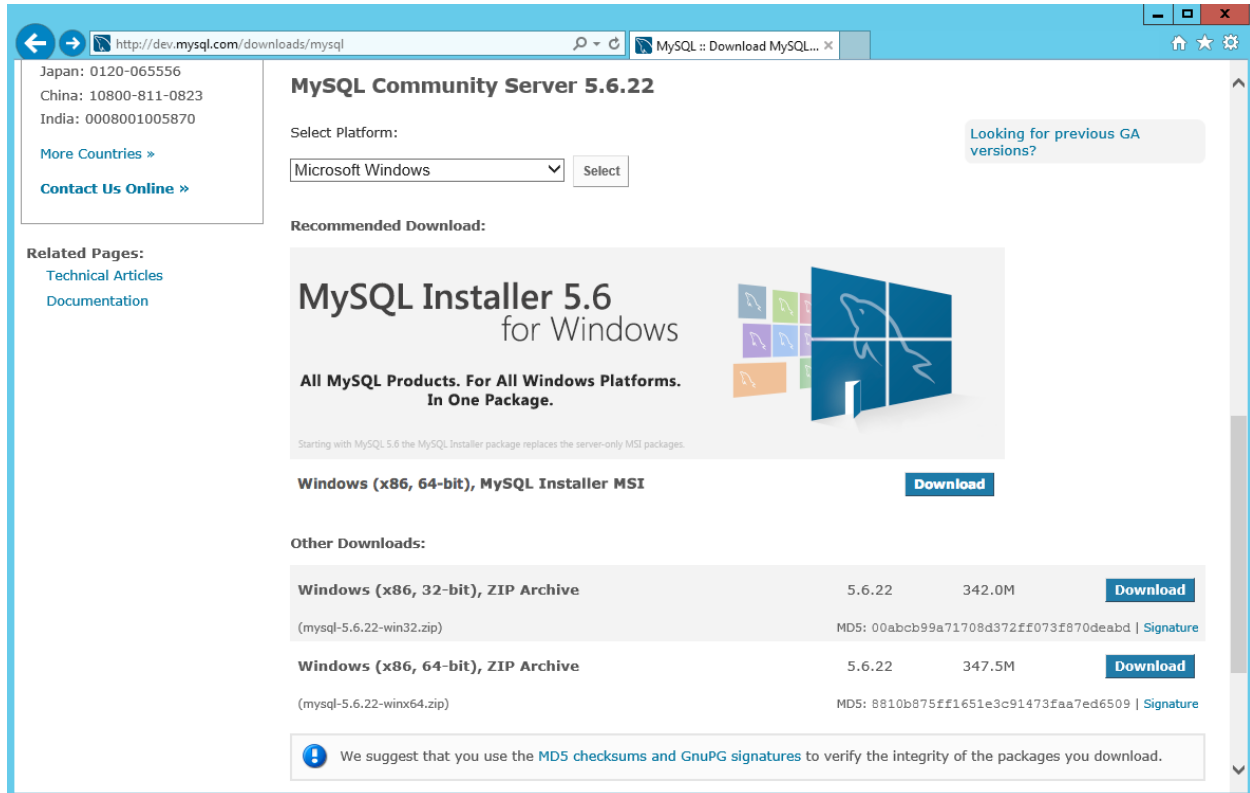


Figure 6 - MySQL Community Server download page.

Then follow the installation wizard, as in the following steps.

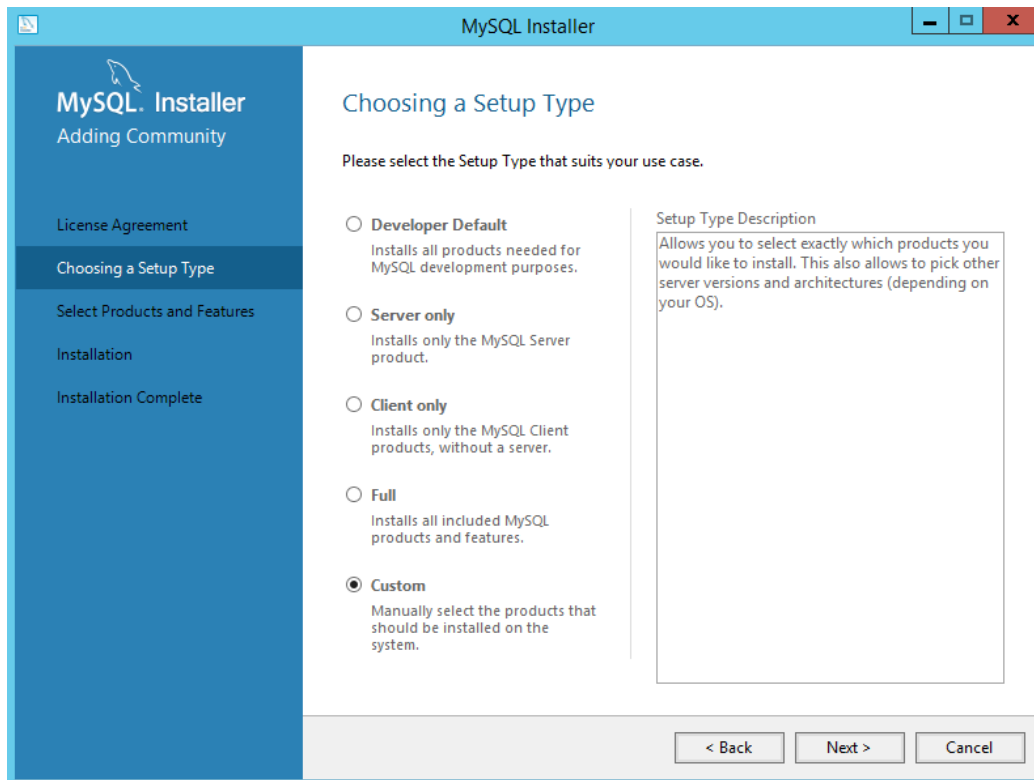


Figure 7 - Select the custom installation and, then click "Next".

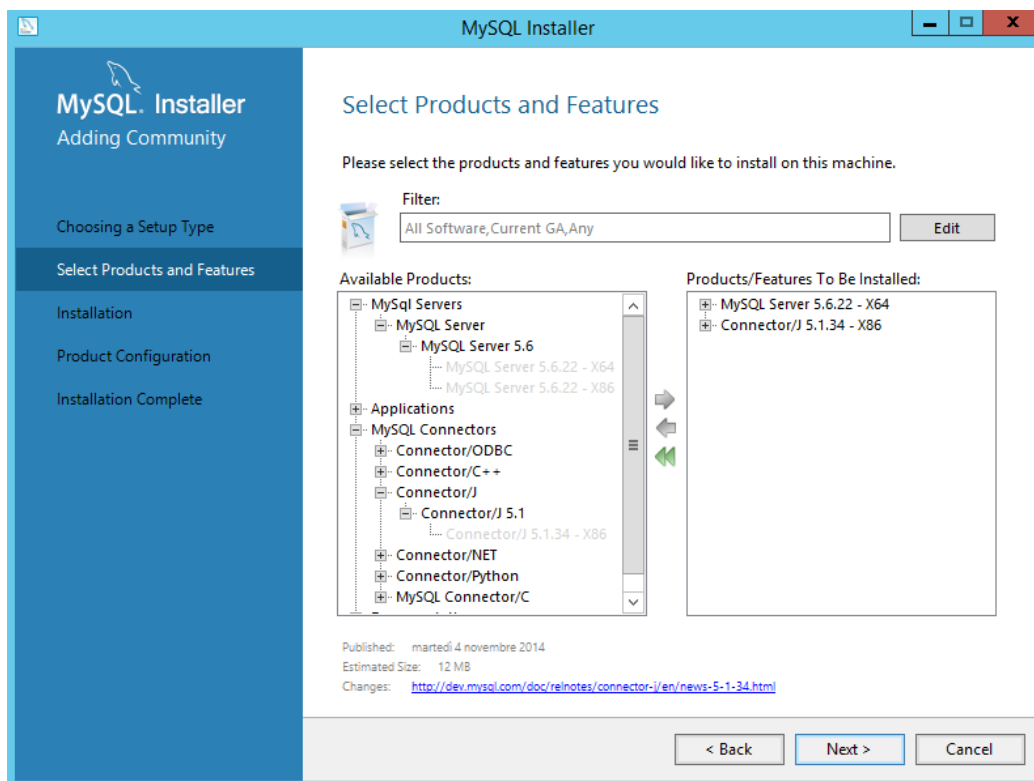


Figure 8 - Select the required MySQL Server and the Connector/J using the arrows in the middle of the window, then click "Next".

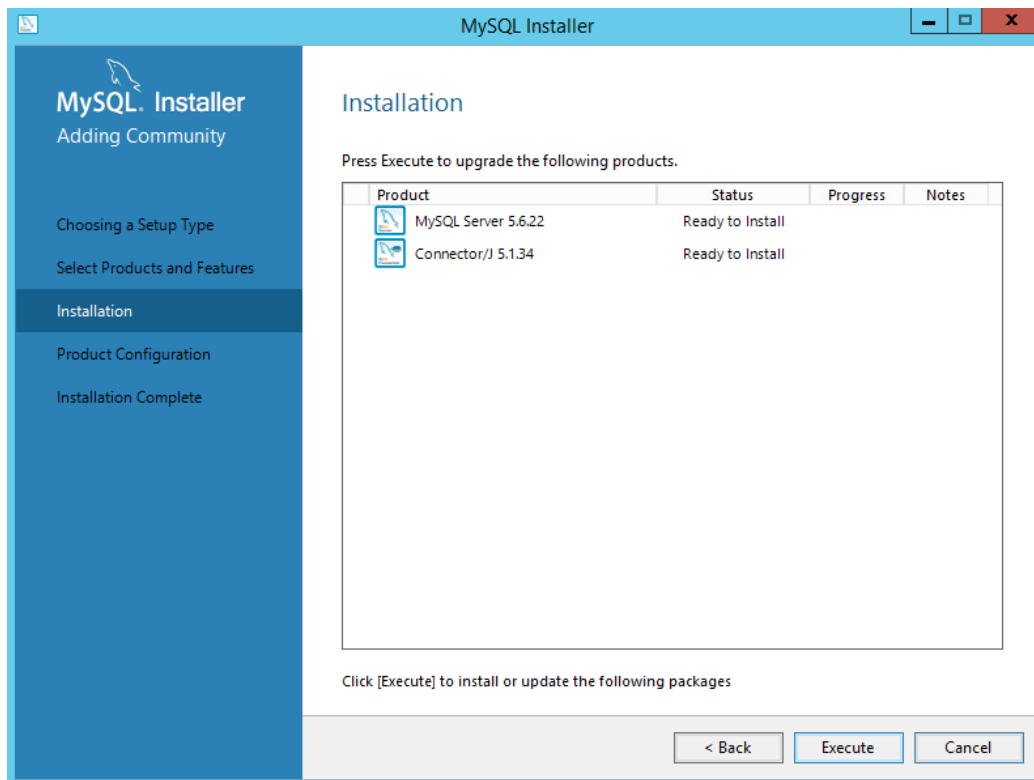


Figure 9 - Confirm clicking on "Execute".

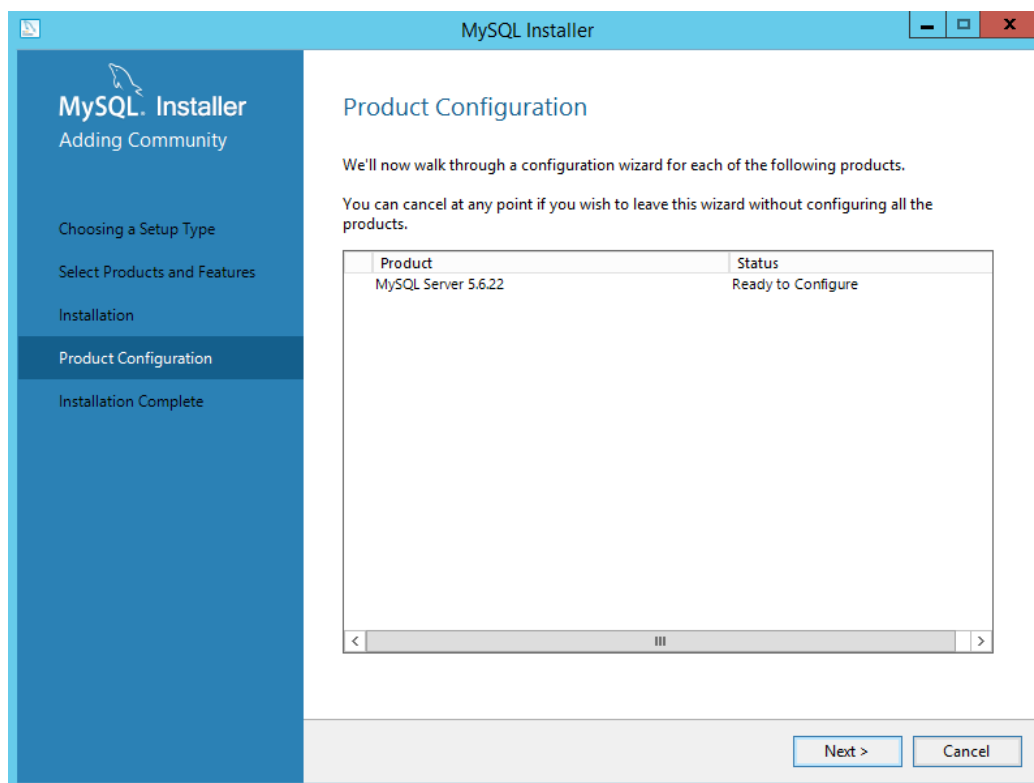


Figure 10 - Confirm clicking on "Next".

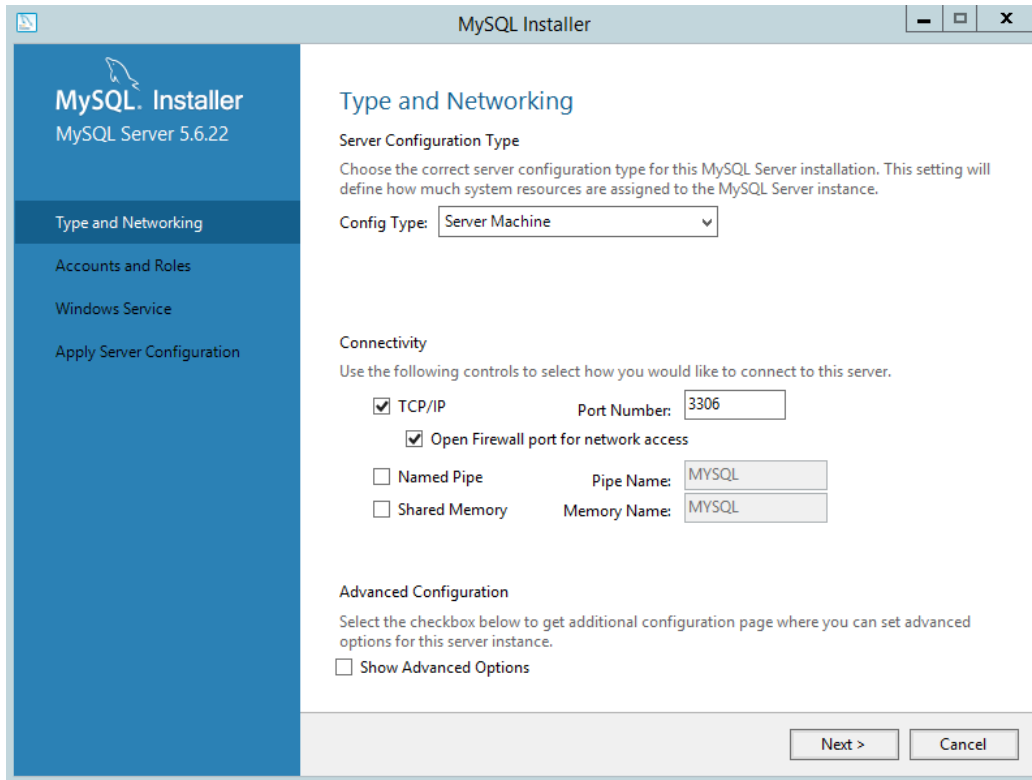


Figure 11 - Confirm clicking on "Next".

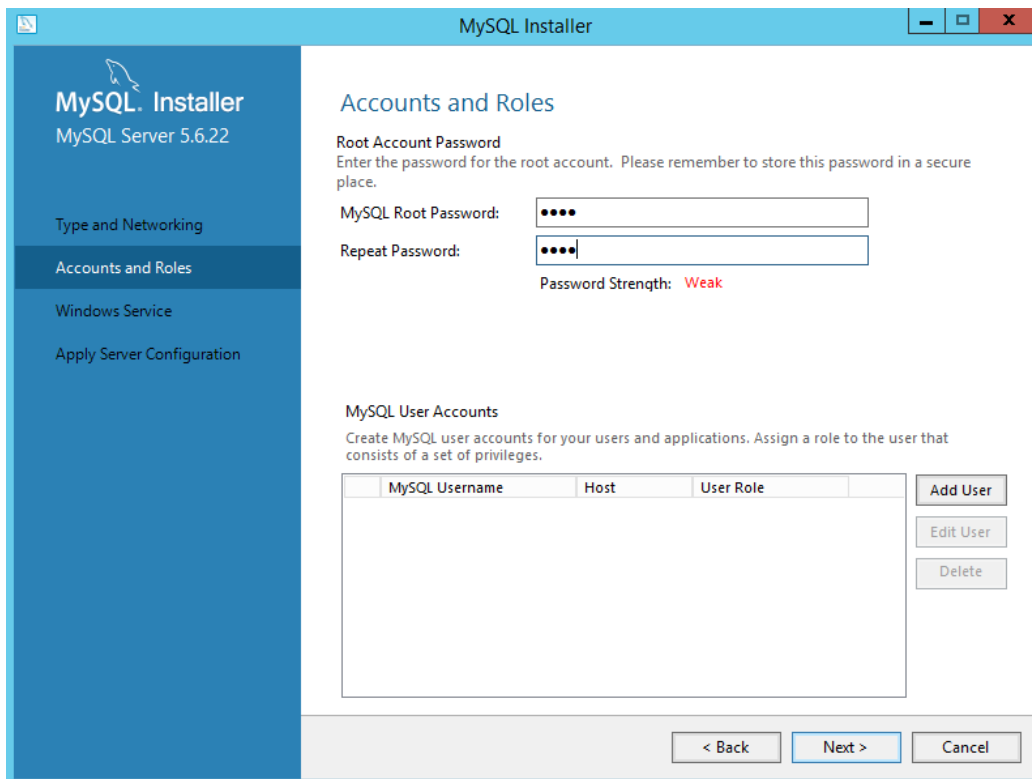


Figure 12 - Insert the password (we have used "root") and then click "Next". You cannot leave this field empty.

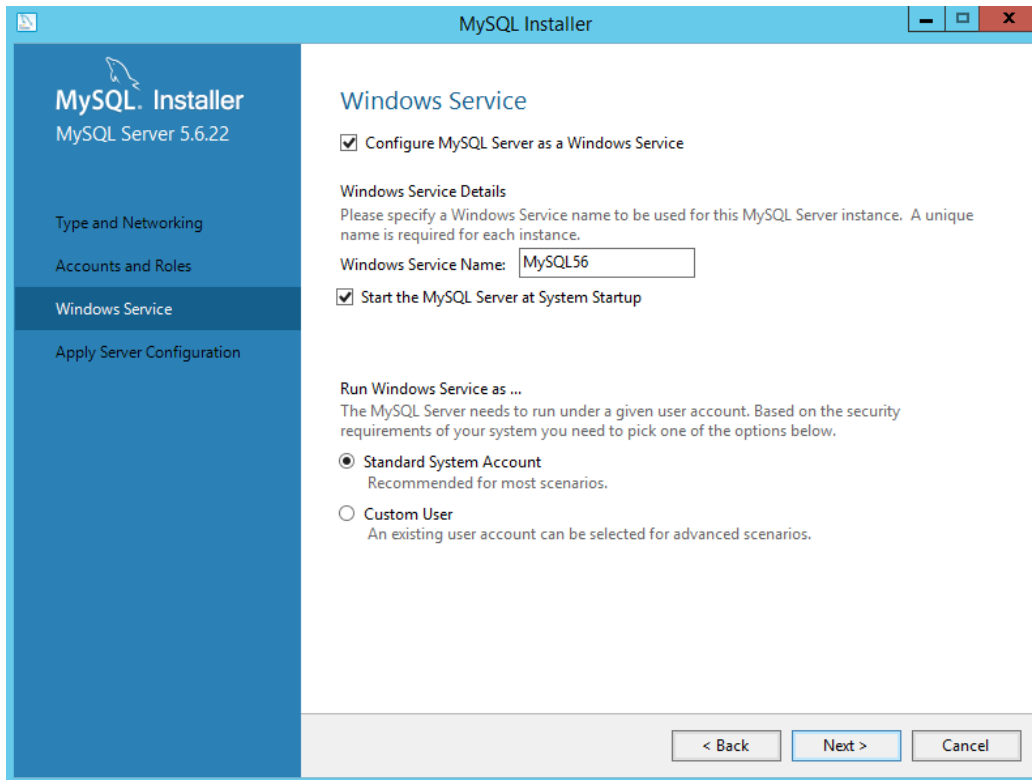


Figure 13 - Click on "Next".

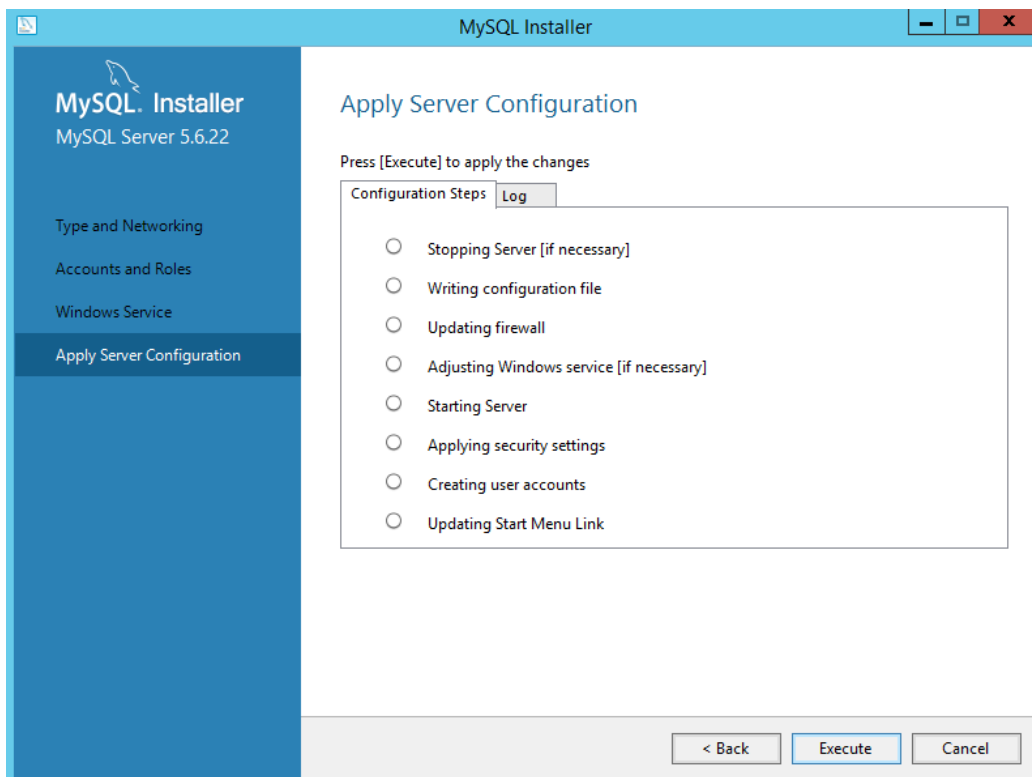


Figure 14 - Click on "Execute".

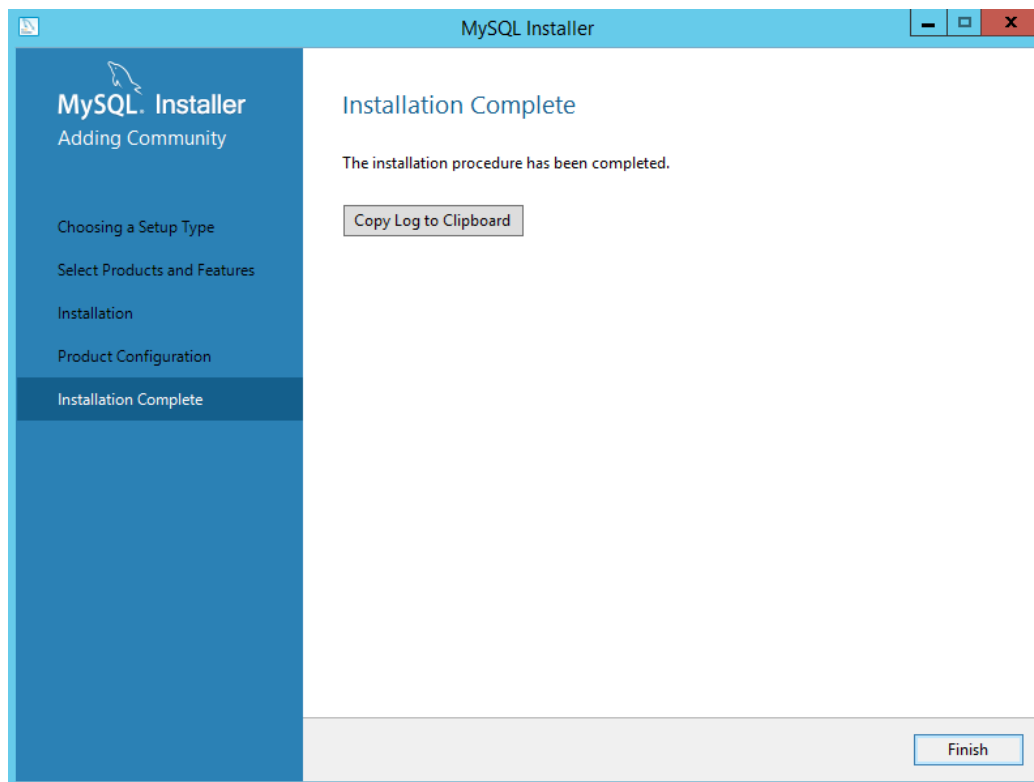
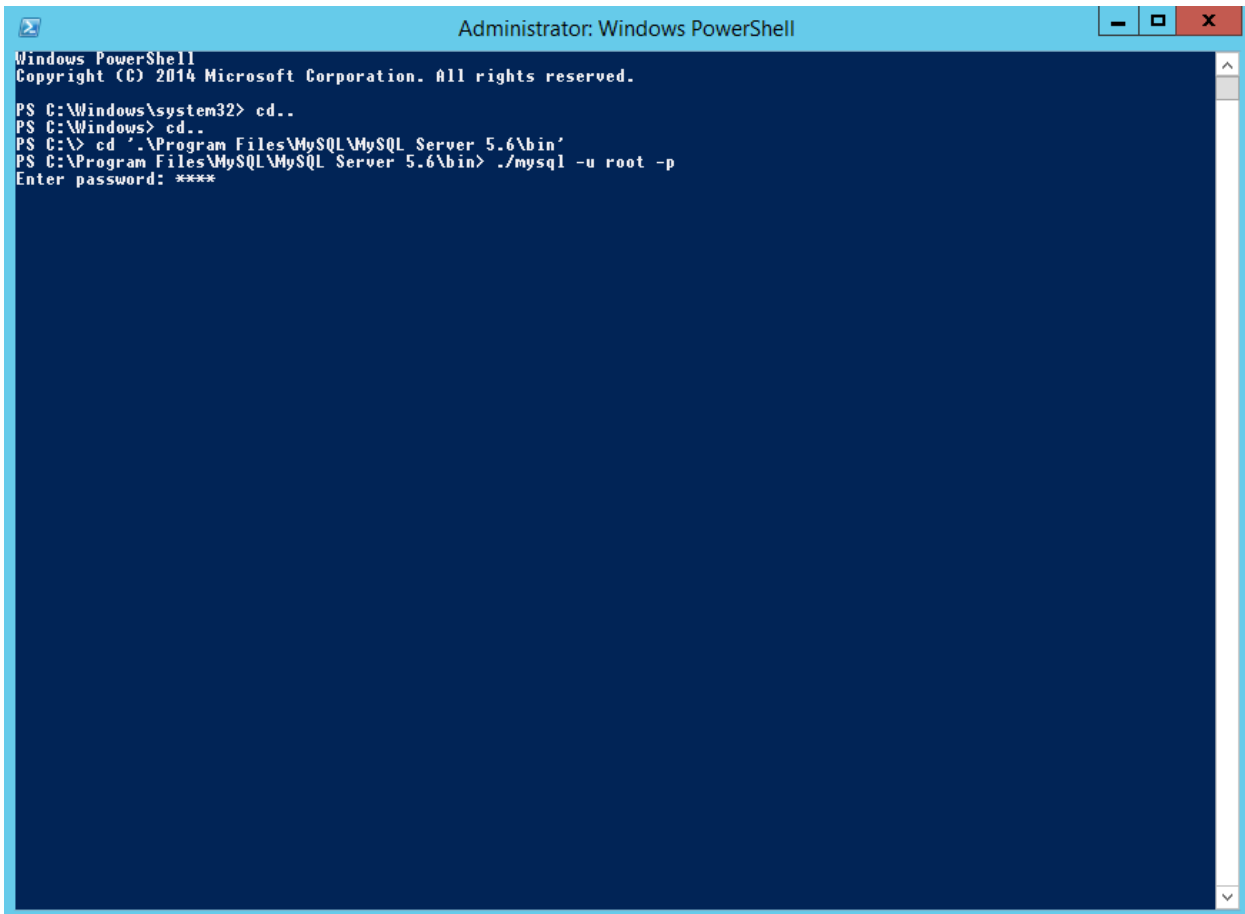


Figure 15 - Click on "Finish".

2.6. Run MySQL

To start MySQL, just move in the installation folder and, then, run `mysql -u root -p`. When requested, provide the password (e.g. root) and enter.

A screenshot of a Windows PowerShell window titled "Administrator: Windows PowerShell". The window has a blue title bar and a dark blue background. The text inside shows the following commands and output:

```
Windows PowerShell
Copyright (C) 2014 Microsoft Corporation. All rights reserved.

PS C:\Windows\system32> cd..
PS C:\Windows> cd..
PS C:\> cd '.\Program Files\MySQL\MySQL Server 5.6\bin\'
PS C:\Program Files\MySQL\MySQL Server 5.6\bin> ./mysql -u root -p
Enter password: ****
```

3. Database configuration

3.1. Create the database schema in MySQL

Download this file (e.g. in C:\Users\Administrator\Downloads):

<https://meteocal-fermi-grillo-jerry.googlecode.com/svn/downloads/meteocaldb-dump.sql>

Inside the MySQL console (opened in *Section 2.6. – Run MySQL*) type this command to load the actual database (i.e. meteocaldb):

```
source C:\Users\Administrator\Downloads\meteocaldb-dump.sql
```

3.2. Install MySQL Java connector

Now you have to install the MySQL Java connector (i.e. Connector/J) in GlassFish to let the Server communicate with the database. You just have to copy the file (e.g. mysql-connector-java-5.1.34-bin) from the MySQL folder (e.g. C:\Program Files (x86)\MySQL\Connector.J 5.1) to the GlassFish Server folder:

```
glassfish4/glassfish/bin
```


3.3. Configure GlassFish

Open your browser and open the admin's GlassFish console going to:

<http://localhost:4848/>

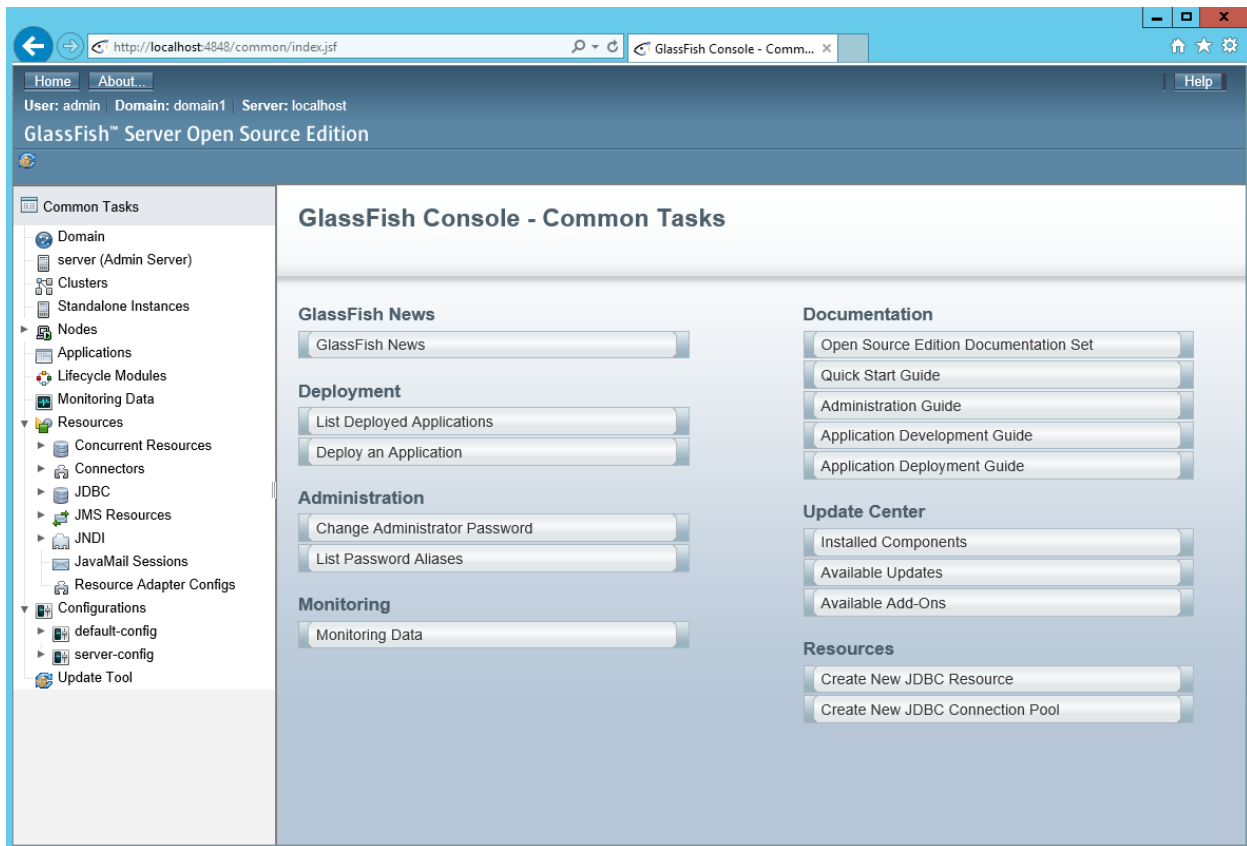


Figure 16 - Glassfish admin's console.

To allow the form-based authentication, create a JDBCRealm following these steps:

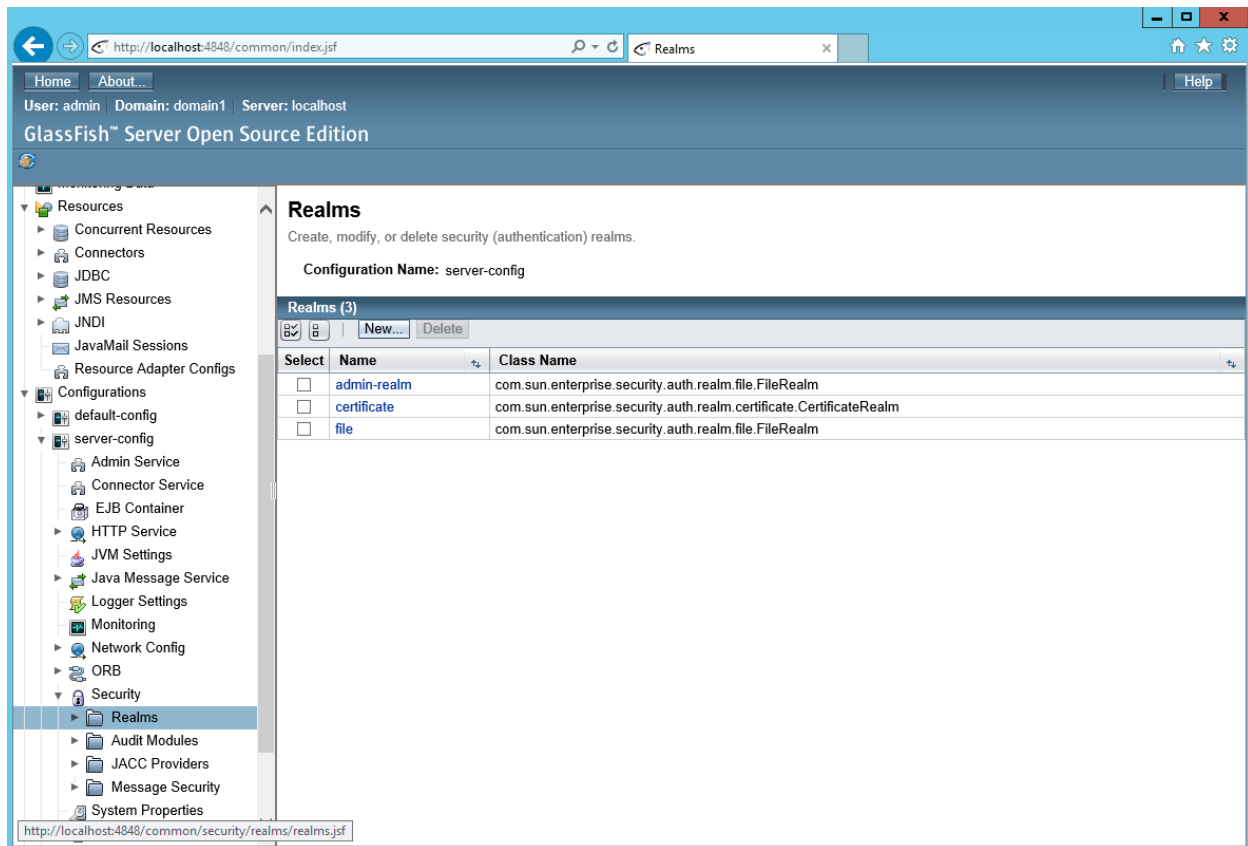


Figure 17 - Configurations > server-config > Realms > New...

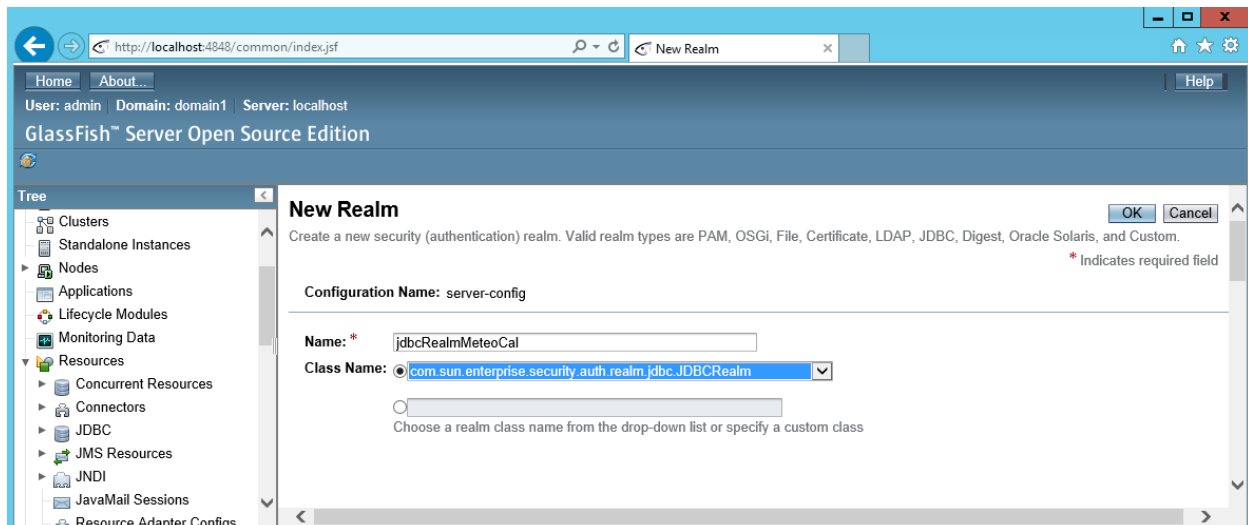


Figure 18 - Name: jdbcRealmMeteoCal > Class Name: com.sun.enterprise.security.auth.realm.jdbc.JDBCRealm > OK

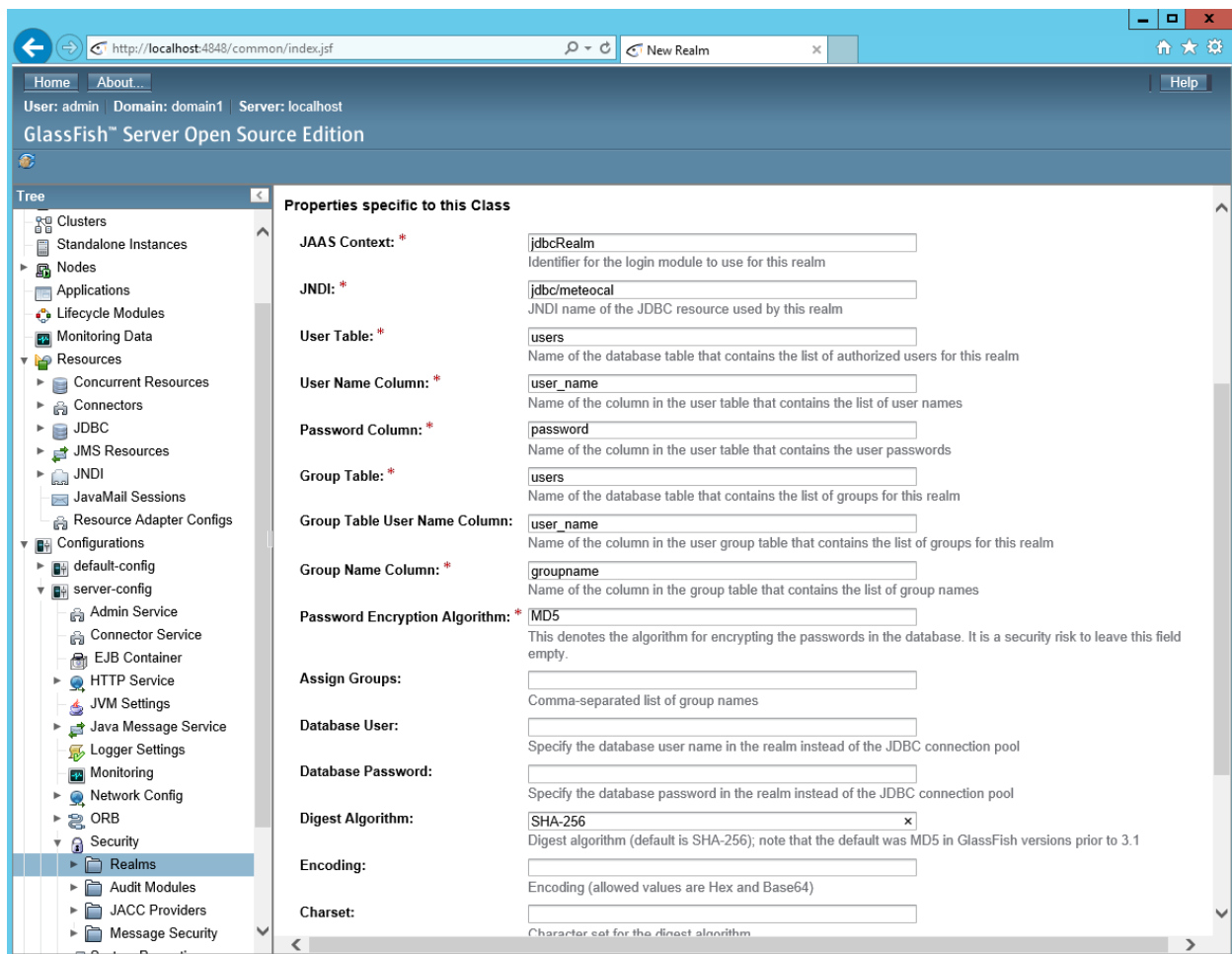


Figure 19 - In the bottom of the page, JAAS Context: *jdbcRealm* > JNDI: *jdbc/meteocal* > User Table: *users* > User Name Column: *user_name* > Password Column: *password* > Group Table: *users* > Group Table User Name Columns: *user_name* > Group Name Column: *groupname* > Password Encryption Algorithm: *MD5* > Digest Algorithm: *SHA-256*.

Now re-start the server to configure the JDBC connection pool. To restart the server, in the Common task menu, select server (Admin server) and then click on the Stop button. At the end repeat the starting procedure described in *Section 2.4 – Start GlassFish*.

Continue with the following steps:

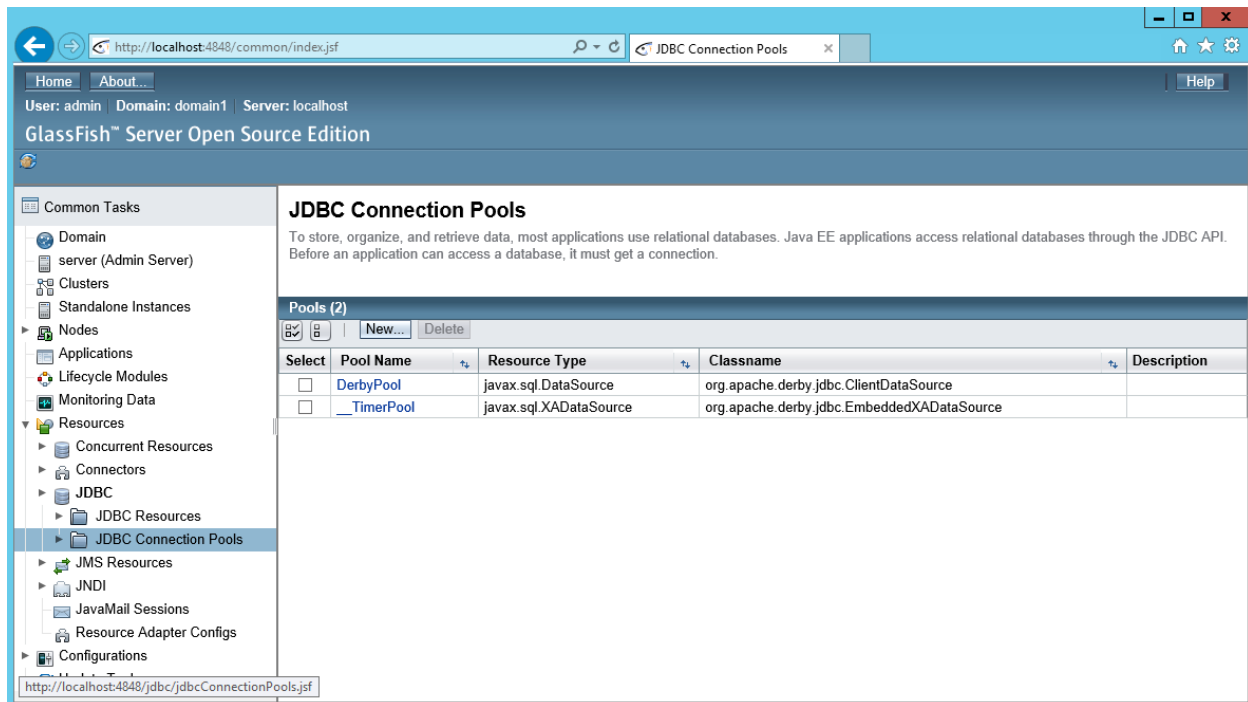


Figure 20 - Resources > JDBC > JDBC Connection Pools > New...

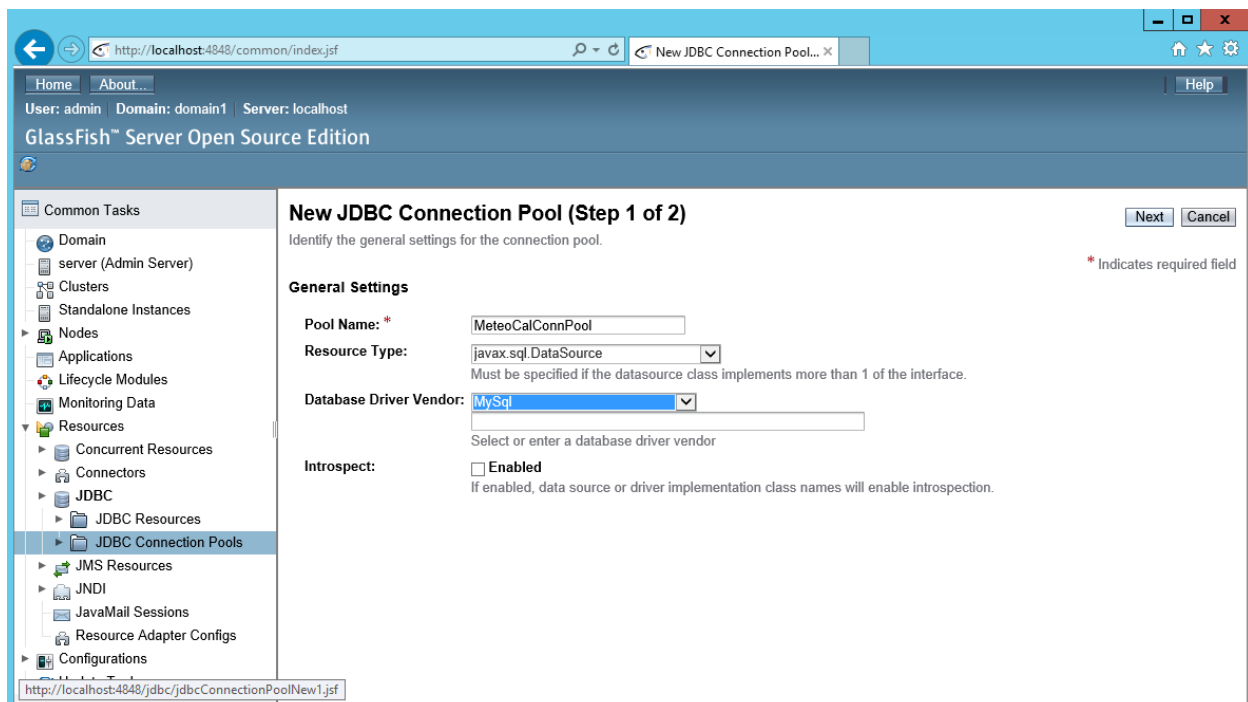


Figure 21 - Pool Name: MeteoCalConnPool > Resource Type: javax.sql.DataSource > Database Driver Vendor: MySQL > Next

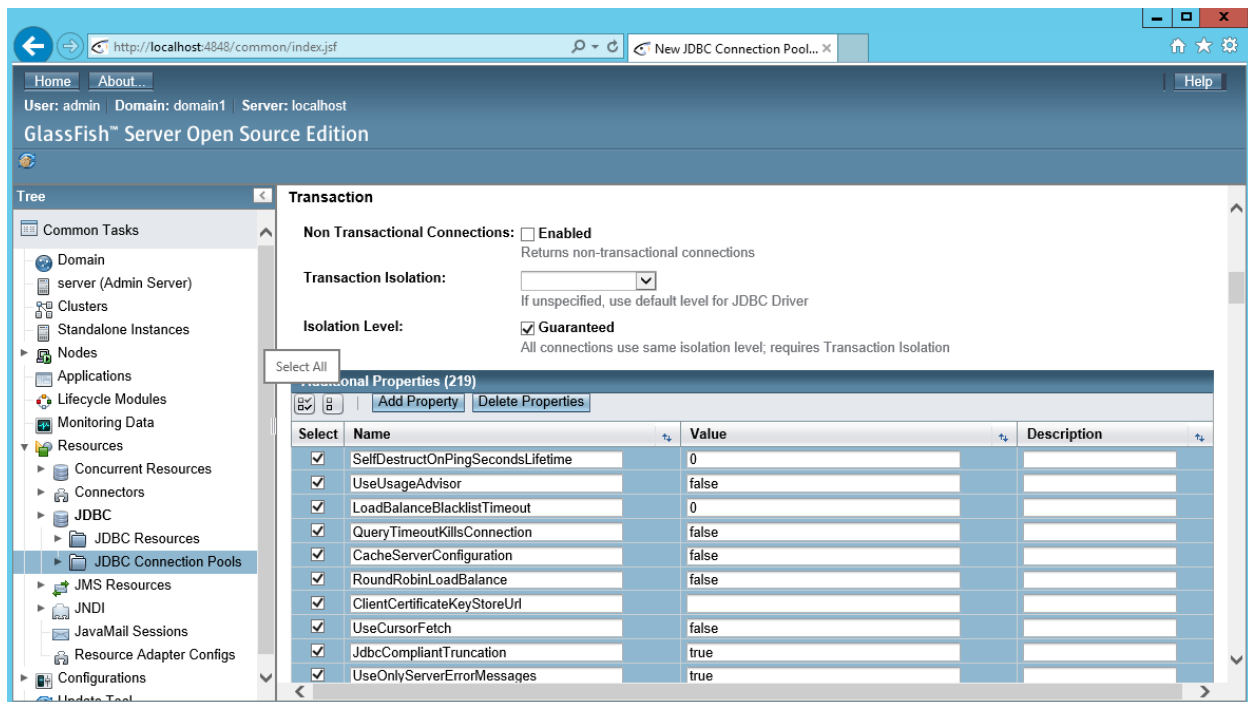


Figure 22 - At the bottom of the screen, select all the rows and click on "Delete Properties".

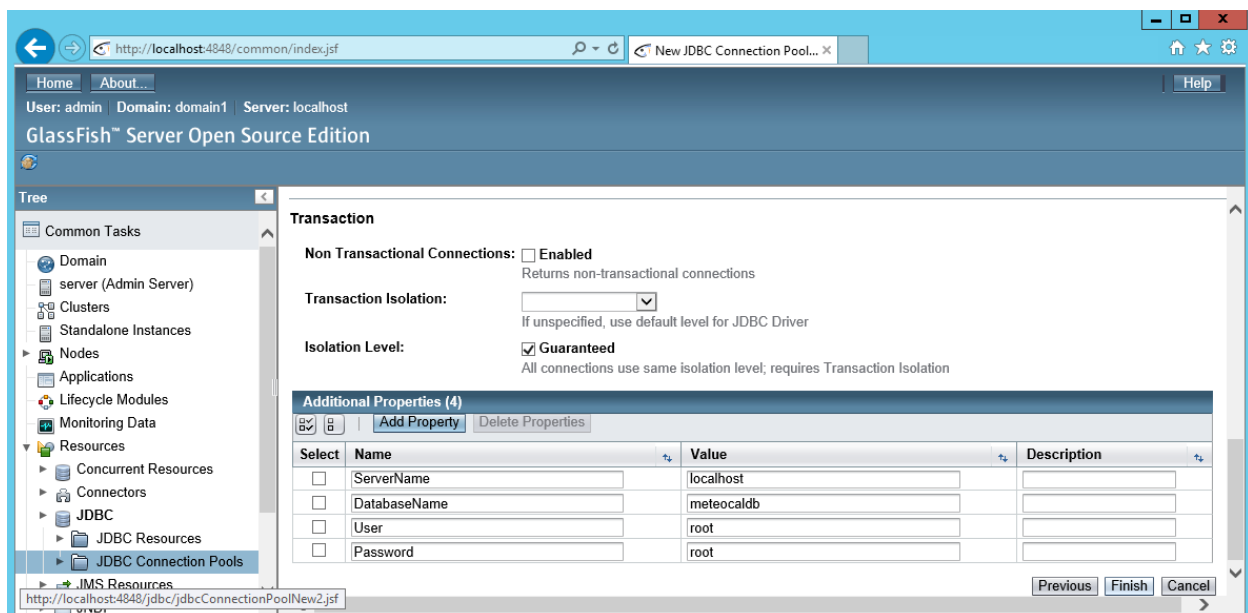


Figure 23 - ServerName: localhost > DatabaseName: meteoaldb > User: root > Password: root > Finish

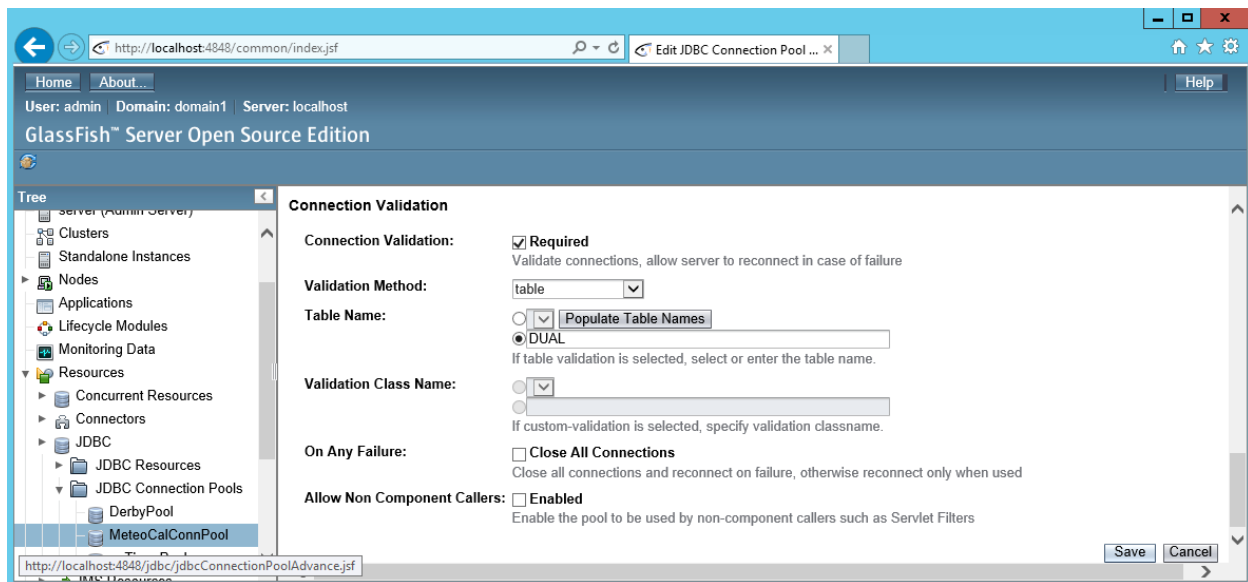


Figure 24 - In the JDBC Connection Pools frame click on the connection pool you just created. Here, you can review and edit information about the connection pool. Because Connector/J does not support optimized validation queries, go to the Advanced tab and, under Connection Validation, configure the following settings: 1) Connection Validation: Required; 2) Validation Method: table; 3) Table Name: DUAL.

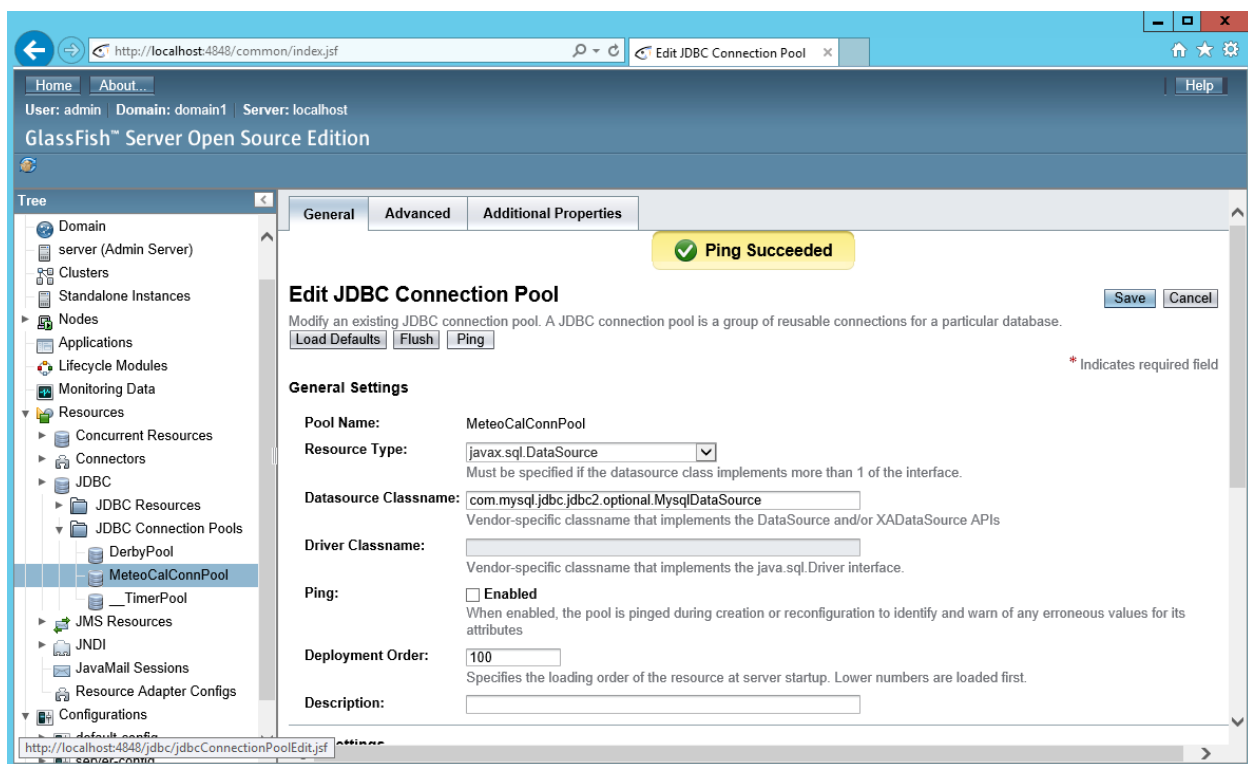


Figure 25 - To test your connection pool click the "Ping" button at the top of the frame. A message will be displayed confirming correct operation (or otherwise). If an error message is received recheck the previous steps and ensure that MySQL Connector/J has been correctly copied into the previously specified location (see Section 3.2 – Install MySQL Java connector).

Now that you have created a connection pool you will also need to create a JDBC Resource (data source) for use by MeteoCal, as follows:

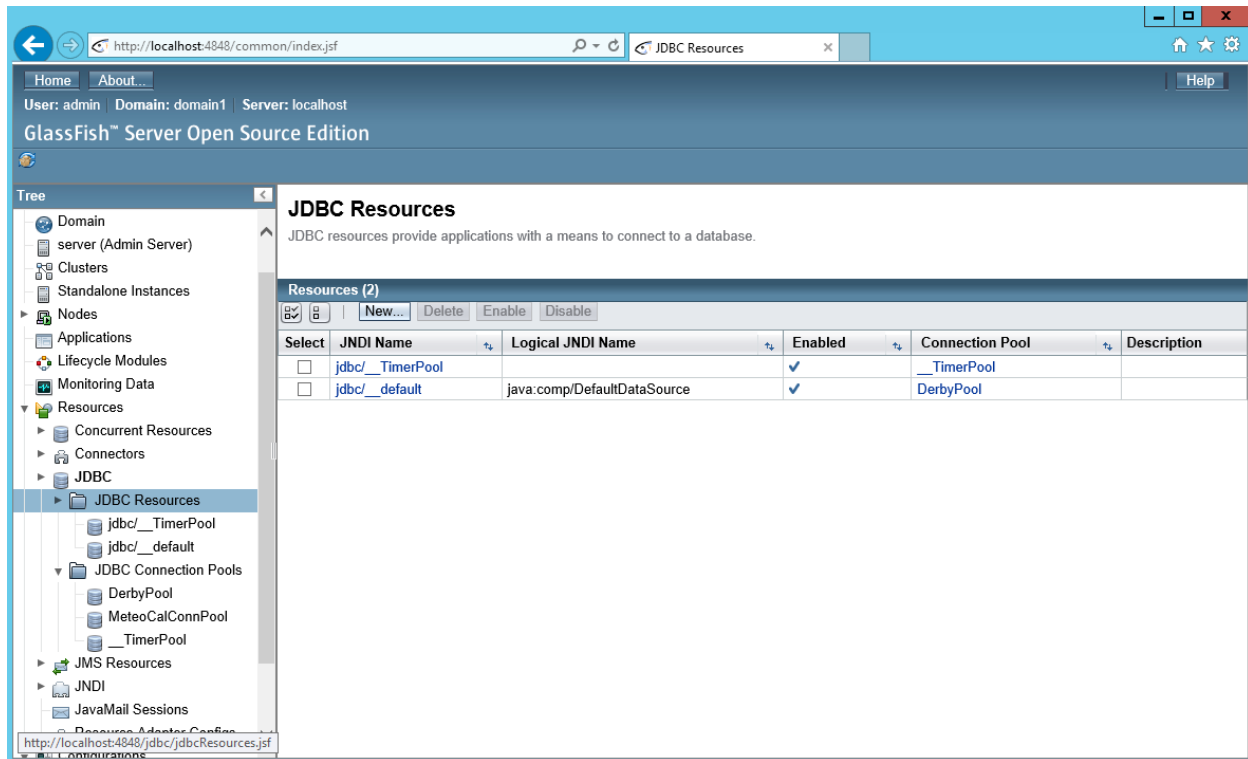


Figure 26 - Resources > JDBC Resources > New...

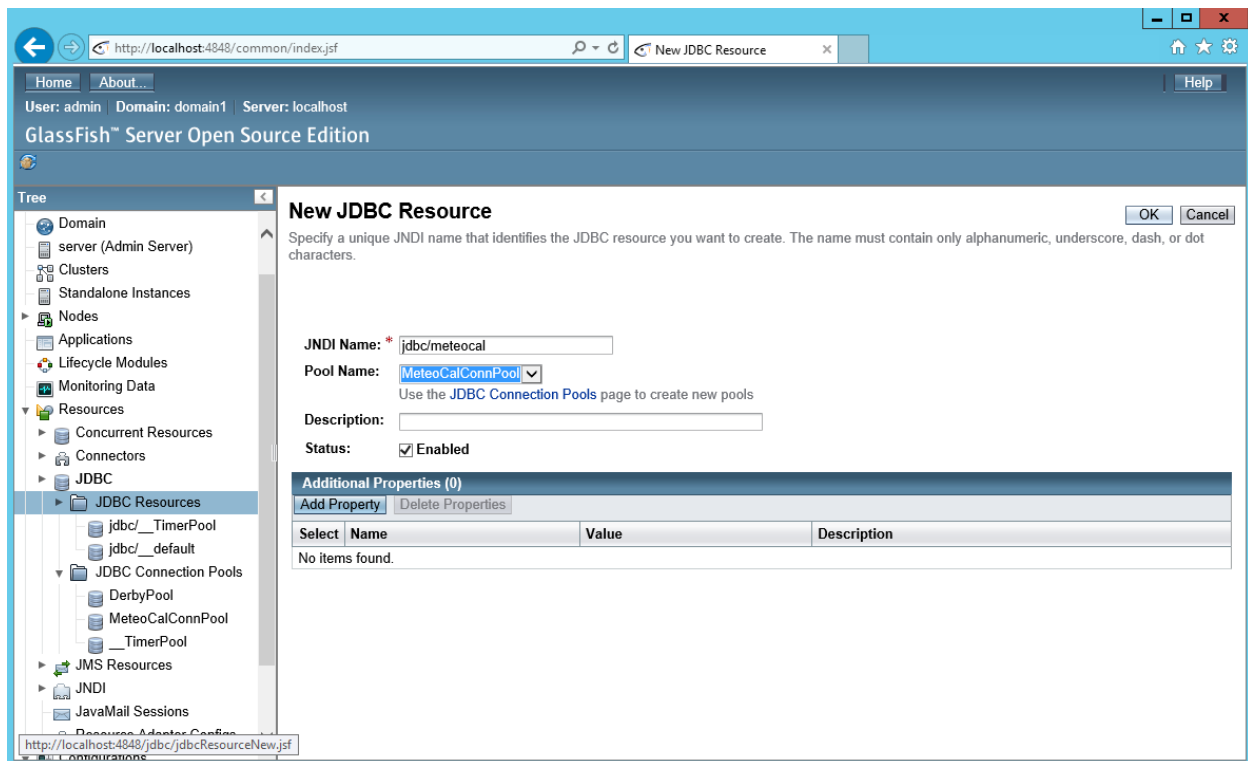


Figure 27- JNDI Name: jdbc/meteocal > Pool Name: MeteoCalConnPool > OK

4. Application deployment

4.1. Deploy the application in GlassFish

To deploy the application, just download the meteocal1.war file from here:

<https://meteocal-fermi-grillo-jerry.googlecode.com/svn/downloads/meteocal.war>

then, from the main GlassFish page select Deploy an application, browse the previously downloaded file, finally, confirm clicking on the OK button in the upper-right corner of the page. The deployed application will be available at the following address:

<http://localhost:8080/meteocal>

Thank you

Appendix A – Secure links for server OSs

Trusted sites

- `www.oracle.com`
- `download.oracle.com`
- `edelivery.oracle.com`
- `dlc.sun.comom.edgesuite.net`
- `cdn.mysql.com`

Direct links

- <https://edelivery.oracle.com/otn-pub/java/jdk/8u25-b18/jdk-8u25-windows-x64.exe>
- <http://dlc.sun.com.edgesuite.net/glassfish/4.1/release/glassfish-4.1.zip>
- <http://dev.mysql.com/get/Downloads/MySQLInstaller/mysql-installer-community-5.6.22.0.msi>

Appendix B – Server settings recap

Configurations

- **server-config** (name)
 - o **Security**
 - **Realm**
 - **Name:** jdbcRealmMeteoCal
 - **Class name:** com.sun.enterprise.securit.auth.realm.jdbc.JDBCRealm
 - o **Properties**
 - **JAAS Context:** jdbcRealm
 - **JNDI:** jdbc/meteocal
 - **User table:** users
 - **User name column:** user_name
 - **Password column:** password
 - **Group table:** users
 - **Group table user name column:** user_name
 - **Group name column:** groupname
 - **Password encryption algorithm:** MD5
 - **Digest algorithm:** SHA-256

Resources

- **JDBC**
 - o **Connection pool**
 - **General**
 - **General settings**
 - o **Pool name:** MeteoCalConnPool
 - o **Resource type:** javax.sql.DataSource
 - o **Database driver vendor:** MySql
 - o **Datasource classname:** com.mysql.jdbc2.optional.MysqlDataSource
 - o **Introspect:** not enabled
 - o **Ping:** not enabled
 - o **Deployment order:** 100
 - **Transaction**
 - o **Non transactional connections:** not enabled
 - o **Transaction isolation:** default level for JDBC Driver
 - o **Isolation level:** guaranteed
 - **Pool settings**
 - o **Initial and minimum pool:** 8 connections
 - o **Maximum pool size:** 32 connections
 - o **Pool resize quantity:** 2 connections
 - o **Idle timeout:** 300 seconds
 - o **Max wait time:** 60000 milliseconds
 - **Additional properties** (Name/Value)
 - ServerName/localhost
 - DatabaseName/meteocaldb
 - User/root
 - Password/root

- **Advanced attributes**
 - **Connection validation**
 - **Connection validation:** required
 - **Validation method:** table
 - **Table name:** DUAL
 - **On any failure:** reconnect only when used
 - **Allow non-component callers:** not enabled
 - **Connection settings**
 - **Validate at most once:** 0 seconds
 - **Connection leak timeout:** 0 seconds
 - **Connection leak reclaim:** not enabled
 - **Statement leak timeout:** 0 seconds
 - **Statement leak reclaim:** not enabled
 - **Creation retry attempts:** 0
 - **Retry interval:** 10 seconds
 - **Lazy association:** not enabled
 - **Lazy connection enlistment:** not enabled
 - **Associate with thread:** not enabled
 - **Match connections:** not enabled
 - **Max connection usage:** 0
 - **Statement timeout:** not enabled
 - **Statement cache size:** 0
 - **Wrap JDBC objects** (enabled)
 - Statement
 - PreparedStatement
 - CallableStatement
 - ResultSet
 - DatabaseMetaData
 - **Pooling** (enabled)
 - Connection pooling for the pool
- **Resources**
 - **JNDI name:** jdbc/meteocal
 - **Pool name:** MeteoCalConnPool
 - **Status:** enabled

Appendix C – Revision history

Initial release:	v1.0
Current release:	v1.0
Date of the last review:	2015/01/24

V0.90

2014/01/19 – Release candidate 1 (complete)

V0.99

2014/01/24 – Release candidate 2 (added appendix B)

V1.0

2014/01/24 – Initial release