Build and Install

Guide

(OpenMark Authoring Tool)

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# Description

The OpenMark Authoring Tool is a web application to generate questions and tests (consisting of questions) that can be executed with OpenMark.

OpenMark is on the other hand a system of tests capable of executing questions and tests.

On a technical level OpenMark doesn’t ease the task of creating questions to users without some programming knowledge, and for that reason we have developed the authoring tool.

The goals of the authoring tool are:

* Mainly that a user with basic computer skills will be able to easily create and modify questions and tests for OpenMark.
* That the application, be sure to inform the user of the fields that are not correctly filled and explain the reason for making it easy to fix.
* To make possible to run these questions and tests within a testing environment to verify that they are viewed and work as expected.
* To allow storage of multimedia resources that can be used with the questions.
* That all questions, tests and resources can be arranged in an orderly way to make it easier to locate.
* Make it possible for a user to have private access to some of his/her questions, tests and resources, so that only he/she (or someone with enough administration permissions) can access them, and at the same time that he/she has some way of making accessible other of his/her questions, tests and resources to other users.

# Prerequisites

Before the installation of different environments required by the OpenMark Authoring Tool we need to have the following software installed on the system:

* Java (JDK 6 or greater)
* Apache Tomcat web server (version 6 is recommended)
* Apache ANT 1.7.0 or greater
* PostgreSQL database server
* 'Verdana' and 'Times New Roman' fonts installed on the system, with all its variants.

# Environments

OpenMark authoring tool needs the following environments installed before working:

* ***OpenMark Authoring Tool* web application (*GEPEQ*)**: It is the main Java application used to generate questions and tests for OpenMark. Must be installed on Apache Tomcat server.
* ***OpenMark Authoring Tool* database (*gepeq*)**: It is the database used by OpenMark Authoring Tool. Currently only supported with PostgreSQL.
* ***‘OpenMark Developer’ web application* (*om-dev*)**: This web application is part of OpenMark and is used to compile questions and to generate the jar files required for its execution. It also allows you to run questions, but this functionality is not properly supported for multiuser environments, so this functionality for previewing OpenMark questions is not used. It is used a special implementation of OpenMark servlet (*om.devservlet.uned.DevServlet*) that has some special operations and web services invoked from Openmark Authoring Tool. Must be installed on Apache Tomcat server.
* **Preview environment for OpenMark**: It is needed a preview environment where you can preview questions and tests created with the OpenMark authoring tool before publishing them.

This environment consists of three sub-environments:

1. *‘OpenMark Test Navigator’ web application (om-tn)*: This web application is part of OpenMark and is used to display questions and tests. It is used a special implementation of OpenMark servlet (*om.tnavigator.uned.PreviewNavigatorServlet*) that has some special operations ans web services invoked from OpenMark Authoring Tool. Must be installed on Apache Tomcat server.
2. *‘OpenMark Test Navigator’ database*: It is the database used by *'OpenMark Test Navigator'* to save the users progress and results. For now we have PostgreSQL and SQL Server support for this database, but we recommend using PostgreSQL.
3. *‘OpenMark Question Engine’ web application (om-qe)*: This web application is part of OpenMark and it is used through web services. They also have been defined special web services invoked from OpenMark authoring tool. Must be installed on Apache Tomcat server.

* **Publication environment for OpenMark**: It is needed a publication environment where you can publish questions and tests created with OpenMark authoring tool, so that they are accessible by all other users.

This environment consists of three sub-environments:

1. *‘OpenMark Test Navigator’ web application (om-tn-pro)*: This web application is part of OpenMark and is used to display questions and tests. It is used a special implementation of OpenMark servlet (*om.tnavigator.uned.LogoutNavigatorServlet*) that has some special operations ans web services invoked from OpenMark Authoring Tool. Must be installed on Apache Tomcat server.
2. *‘OpenMark Test Navigator’ database*: It is the database used by *'OpenMark Test Navigator'* to save the users progress and results. For now we have PostgreSQL and SQL Server support for this database, but we recommend using PostgreSQL.
3. *‘OpenMark Question Engine’ web application (om-qe-pro)*: This web application is part of OpenMark and it is used through web services. Must be installed on Apache Tomcat server.

# Build and Install with Apache Ant

The whole process of compilation and installation of OpenMark authoring tool, as well as the environments needed to work correctly, can be carried out running the file *‘build.xml’* (found on the initial project folder) with Apache Ant.

To do this we recommend using version 1.7 or above of Apache Ant, which is also a requirement for *‘OpenMark Developer’* web application (*om-dev*) to work properly.

Alternatively, you can install the different environments manually according to the install guide of the folder *‘docs/old’*, but is not recommended as this method is more complicated and limited, for example it requires having Java classes already compiled and it does not generate *‘.jar’* files before deploying Web applications, but instead it requires copying *‘.class’* files to the folder *‘WEB-INF/classes’* of *‘OpenMark Author Tool’* web application (*GEPEQ*).

## The build.xml file tasks

The *‘build.xml’* file has several predefined tasks to compile, create jar files and deploy Web applications required by OpenMark authoring tool.

The most important are:

* *deployall*: It is the main task and it is responsible for invoking the others and compiling and deploying all environments and Web applications required by OpenMark authoring tool.
* *gepeq­webapp*: This task is responsible for compiling and deploying *‘OpenMark Author Tool’* Web application (*GEPEQ*), but it does not deploy the rest of environments and web applications required to preview and run OpenMark questions and tests.
* *om­webapp*: This task is responsible for deploying *‘OpenMark Developer’* Web application (*om-dev*), which is used to compile the questions before they can be previewed and/or run with OpenMark.
* *om­qe­webapp*: This task is responsible for deploying *‘OpenMark Question Engine’* Web application for preview environment (*om­qe*), which it is responsible of running code of the OpenMark questions for previewing them.
* *om­tn­webapp*: This task is responsible for deploying *‘OpenMark Test Navigator’* Web application for preview environment (*om­tn*), which allows the user to preview questions and tests generated with the OpenMark authoring tool.
* *om­qe­pro­webapp*: This task is responsible for deploying *‘OpenMark Question Engine’* Web application for publication environment (*om­qe­pro*), which it is responsible of running code of the already published OpenMark questions.
* *om­tn­pro­webapp*: This task is responsible for deploying *‘OpenMark Test Navigator’* Web application for publication environment (*om­tn­pro*), which allows the user to run questions and tests published with the OpenMark authoring tool.
* *clean­all*: This task deletes all target folders in which are compiled and deployed web applications. If we have made a compilation / installation previously is useful to invoke this task first to avoid leaving old files on output folders that can crash the process or cause errors.
* *jar*: This task is responsible for compiling source code for OpenMark authoring tool and generating the *“.jar”* files with already compiled classes.
* *build*: This task is responsable for compiling source code of OpenMark authoring tool, generating the *“.class”* files with the compiled clases (it does not generates *“.jar”* files).

Usually if we want to install all environments and Web applications needed for correct operation of the authoring tool, we just execute the *“deployall”* task, because it invokes all the other needed tasks.

It is only recommend running previously the *“cleanall”* task to delete any folder or file that there could be within target folders.

## The build.xml file properties setup

The *‘build.xml’* file has defined a good set of properties that allow us to set the target folders and to define settings for all the different environments and Web applications.

Within *‘build.xml’* file it is possible to see a complete listing of all properties with a brief comment indicating the purpose of each one, so here we only explain the most important ones.

It is important that before running *‘build.xml’* tasks properly we configure property values, otherwise we need to do the Web application settings manually and it is more complex and tedious.

### Source and target folders properties

We begin by indicating the properties that allow us to set up the main source and target folders:

* + *src*: Source folder for (Java) source code of the application.
  + *build.classes*: Target folder for *“.class”* files generated when compiling the source code.
  + *build.jars*: Target folder for *“.jar”* files generated with the previously compiled classes.
  + *build.keep*: Target folder to temporarily save files from paths with files to preserve, so these files will be preserved even if they are in folders that will be overwritten.
  + *gepeq­webapp.input*: Source folder of *“OpenMark Authoring Tool”* Web application (*GEPEQ*) with files to be copied when deploying that Web application on target folder.
  + *gepeq­webapp.output*: Target folder to deploy *“OpenMark Authoring Tool”* Web application (*GEPEQ*).
  + *gepeq.createdb*: Source folder with the SQL file template to generate database for *“OpenMark Authoring Tool”* Web application (*GEPEQ*).
  + *gepeq.createdb.output*: Target folder to sabe the SQL file to generate database for *“OpenMark Authoring Tool”* Web application (*GEPEQ*).
  + *gepeq.resources.keep­from.folder*: Optional folder with resources to preserve that will be deployed later within resources folder of *“OpenMark Authoring Tool”* web application (*GEPEQ*).
  + *gepeq.om­questions.keep­from.folder*: Optional folder with questions to preserve that will be deployed later within questions folder of *“OpenMark Authoring Tool”* web application (*GEPEQ*).
  + *om­webapp.input*: Source folder of *“OpenMark Developer”* Web application (*om­dev*) with files to be copied when deploying that Web application on target folder.
  + *om­webapp.output*: Target folder to deploy *“OpenMark Developer”* Web application (*om­dev*).
  + *om­qe­webapp.input*: Source folder of *“OpenMark Question Engine”* Web application for preview environment (*om­qe*) with files to be copied when deploying that Web application on target folder.
  + *om­qe­webapp.output*: Target folder to deploy *“OpenMark Question Engine”* Web application for preview environment (*om­qe*).
  + *om­tn­webapp.input*: Source folder of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*) with files to be copied when deploying that Web application on target folder.
  + *om­tn­webapp.output*: Target folder to deploy *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*).
  + *om­tn.questionbank.gepeq­keep­from.folder*: Optional folder with jar files from questions generated with *“OpenMark Authoring Tool”* web application (*GEPEQ*) that will be deployed later within *“questionbank”* folder of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*).
  + *om­tn.testbank.gepeq­keep­from.folder*: Optional folder with xml files from questions and tests generated with *“OpenMark Authoring Tool”* web application (*GEPEQ*) that will be deployed later within *“testbank”* folder of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*).
  + *om­tn.logs.keep­from.folder*: Optional folder with log files to preserve that will be deployed later within *“logs”* folder of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*).
  + *om­qe­pro­webapp.input*: Source folder of *“OpenMark Question Engine”* Web application for publication environment (*om­qe­pro*) with files to be copied when deploying that Web application on target folder.
  + *om­qe­pro­webapp.output*: Target folder to deploy *“OpenMark Question Engine”* Web application for publication environment (*om­qe­pro*).
  + *om­tn­pro­webapp.input*: Source folder of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*) with files to be copied when deploying that Web application on target folder.
  + *om­tn­pro­webapp.output*: Target folder to deploy *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*).
  + *om­tn­pro.questionbank.gepeq­keep­from.folder*: Optional folder with jar files from questions generated with *“OpenMark Authoring Tool”* web application (*GEPEQ*) that will be deployed later within *“questionbank”* folder of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*).
  + *om­tn­pro.testbank.gepeq­keep­from.folder*: Optional folder with xml files from questions and tests generated with *“OpenMark Authoring Tool”* web application (*GEPEQ*) that will be deployed later within *“testbank”* folder of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*).
  + *om­tn­pro.logs.keep­from.folder*: Optional folder with log files to preserve that will be deployed later within *“logs”* folder of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*).

The source folders do not need to be changed if you keep the original directory structure of the project.

Regarding target folders, by default they are configured to install everything under the folder *‘build’*, but it is possible, for example, to set the target folders of Web applications to be installed directly into the *‘webapps’* folder of Apache Tomcat 6 server of the machine.

There are many more paths that can be configured through properties, as configuration files templates paths, libraries paths (required to compile and / or deploy Web applications, etc.)., all of them can be found within the 'build.xml' file.

### Web applications URLs properties

We need to configure Web applications URLs to allow web services to be invoked correctly.

For that we have the following properties:

* + *gepeq.url*: *“OpenMark Authoring Tool”* Web application (*GEPEQ*) URL.
  + *om.url*: *“OpenMark Developer”* Web applicaction (*om­dev*) URL.
  + *om­qe.url*: *“OpenMark Question Engine”* Web application for preview environment (*om­qe*) URL.
  + *om­tn.url*: *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*) URL.
  + *om­qe­pro.url*: *“OpenMark Question Engine”* Web application for publication environment (*om­qe­pro*) URL.
  + *om­tn­pro.url*: *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*) URL.

By default, these properties are configured with local URLs to access them from the same machine, for example <http://localhost:8080/gepeq> to access *“Authoring Tool for OpenMark”* Web application (*GEPEQ*), but for the application to work independently of the machine it is needed to change the URL for one accessible from other machines.

### Databases properties

To work properly the OpenMark authoring tool needs to configure access to 3 PostgreSQL databases.

On the one hand we have the main database, which is used primarily by *“OpenMark Authoring Tool”* Web application (*GEPEQ*).

The other 2 have the same structure of tables and are used by the 2 *“OpenMark Test Navigator”* Web applications (*om­tn* y *om­tn­pro*).

It would be possible to configure a single database for both, but it is not recommended because the data and results of the executions of questions and tests performed in the preview environment will be mixed with those performed in the publication environment.

The properties we have to configure all of these databases are:

* + *gepeq.createdb.enabled*: Boolean flag to generate (*true*) or not (*false*) the *‘create.db’* file required to generate database for *‘OpenMark Authoring Tool’* Web application (*GEPEQ*). The default is: *false*
  + *gepeq.server*: Name or IP address of the server where it is located the database of the *“OpenMark Authoring Tool”* web application (*GEPEQ*).
  + *gepeq.dbname*: Database’s name of the *“OpenMark Authoring Tool”* web application (*GEPEQ*).
  + *gepeq.username*: Name of a user with read and write permissions to the database of the *“OpenMark Authoring Tool”* web application (*GEPEQ*).
  + *gepeq.password*: Password of the user from *‘gepeq.username’* property.
  + *om­tn.server*: Name or IP address of the server where it is located the database of the *“OpenMark Test Navigator”* web application for preview environment (*om­tn*).
  + *om­tn.dbname*: Database’s name of the *“OpenMark Test Navigator”* web application for preview environment (*om­tn*).
  + *om­tn.prefix*: Prefix used with names of the tables of the database of the *“OpenMark Test Navigator”* web application for preview environment (*om­tn*).
  + *om­tn.username*: Name of a user with read and write permissions to the database of the *“OpenMark Test Navigator”* web application for preview environment (*om­tn*).
  + *om­tn.password*: Password of the user from *‘om­tn.username’* property.
  + *om­tn­pro.server*: Name or IP address of the server where it is located the database of the *“OpenMark Test Navigator”* web application for publication environment (*om­tn­pro*).
  + *om­tn­pro.dbname*: Database’s name of the *“OpenMark Test Navigator”* web application for publication environment (*om­tn­pro*).
  + *om­tn­pro.prefix*: Prefix used with names of the tables of the database of the *“OpenMark Test Navigator”* web application for publication environment (*om­tn­pro*).
  + *om­tn­pro.username*: Name of a user with read and write permissions to the database of the *“OpenMark Test Navigator”* web application for publication environment (*om­tn­pro*).
  + *om­tn­pro.password*: Password of the user from *‘om­tn­pro.username’* property.

By default the server name for the 3 databases is *localhost*, which will work correctly if the databases are installed on the same machine as the Web applications that access them, because the database calls are always made from the server and never from the client of the Web applications, but if they were installed on a different machine, they will require to set a name or IP address of the server that will be accessible from the machine where Web applications are installed.

As for the names and prefixes of the databases, there can be used the preferred ones or leave the defaults, as long as they will point to real databases with the specified names.

The username and password for each database must be from a user of that database with read and write permissions (and with permission to create tables in the case of the *“OpenMark Test Navigator”* Web applications).

It can be used the same user for all databases if they are in the same database server and that user has all the required permissions, but it can be used different users if preferred.

### “OpenMark Authoring Tool” Web application (GEPEQ) properties

We have the following properties to configure the *“OpenMark Authoring Tool”* Web application (*GEPEQ*):

* + *gepeq.resources.folder*: Name the folder where there are saved the resources uploaded to the server. The default is: *gepec\_resources*
  + *gepeq.om­questions.folder*: Name the folder where there are generated the questions before being compiled. The default is: *om\_questions*
  + *gepeq.tmp.folder*: Name of the folder where there are saved temporarily resources to be previewed. The default is: *tmp*
  + *gepeq.proxy.url*: Proxy URL to use to access Internet resources. It can be left blank to not configure any proxy.
  + *gepeq.proxy.port*: Proxy port to access Internet resources.
  + *gepeq.proxy.username*: Proxy username to use to access Internet resources. It can be left blank if the proxy to configure does not require authentication.
  + *gepeq.proxy.password*: Password of the user from *‘gepeq.proxy.username’* property of the proxy to use to access Internet resources.
  + *gepeq.proxy.non­proxy­hosts*: List of servers (or IP addresses) that do not require to be accessed via proxy (the separator character used is *|* and the IP addresses support the wildcard *\**). The default is *localhost*, because the local machine does not usually need to be accessed via proxy.
  + *javax.faces.FACELETS\_REFRESH\_PERIOD*: Refresh time in seconds for Facelets (*.xhtml* files processed by JSF 2). It can be used a value of *­*1 for disabling the refresh.
  + *javax.faces.PROJECT\_STAGE*: Fase del proyecto. JSF 2 puede tener comportamientos diferentes en determinados casos según dicha fase.
  + *primefaces.fileupload.thresholdsize*: Configuration setting of Primefaces file uploading. Maximum file size in bytes to keep uploaded files in memory. If a file exceeds this limit, it will be temporarily written to disk.
  + *gepeq.rootuser.login*: Identity of the inital user with full administrative permissions for *“OpenMark Authoring Tool”* Web application (*GEPEQ*). If not set the default is: *profesor*
  + *gepeq.rootuser.password*: Password of the user defined by *‘gepeq.rootuser.login’* property. If not set the default is: *profesor*
  + *gepeq.rootuser.name*: Name of the user defined by *‘gepeq.rootuser.login’* property. If not set the default is: *Profesor*
  + *gepeq.rootuser.surname*: Surname of the user defined by *‘gepeq.rootuser.login’* property.
  + *gepeq.rootuser.nickname*: Nickname of the user defined by *‘gepeq.rootuser.login’* property. If not set the default is: *Profesor*
  + *gepeq.rootuser.oucu*: Identity of the user defined by *‘gepeq.rootuser.login’* property for “OpenMark Test Navigator” Web applications (*om­tn*, *om­tn­pro*). If not set the default is: *profesor*
  + *gepeq.adminusertype.type*: Name of the role with administrative permissions for *“OpenMark Authoring Tool”* Web application (*GEPEQ*). If not set the default is: *Administrador*
  + *gepeq.adminusertype.description*: Description of the role defined by *‘gepeq.adminusertype.type’* property. If not set the default is: *Con permisos para labores de administración*

Proxy settings are only required if the machine where it is installed the OpenMark authoring tool needs to access Internet resources via proxy.

The other settings have valid default values and they only will be needed to modify in specific cases.

### “OpenMark Developer” Web application (om­dev) properties

We have the following properties to configure the “*OpenMark Developer*” Web application (*om­dev*):

* + *jdk*­*home*: Path where it is installed *“Java Development Kit”*. It must be a local path on the machine where is to be installed the OpenMark authoring tool.
  + *ant­home*: Path where it is installed *“Apache Ant”*. It must be a local path on the machine where is to be installed the OpenMark authoring tool.
  + *om.devservlet*: Full name of the Java class used as servlet for *“OpenMark Developer”* Web application (*om­dev*). The default is: *om.devservlet.uned.DevServlet*

Installation paths of *“Java Development Kit”* and *“Apache Ant”* must be specified or the *“OpenMark Developer”* Web application (*om­dev*) will not work properly.

The name of the class used as servlet for the Web application is not needed to be changed, except in advanced cases where we have another class to perform the operations of the servlet of *“OpenMark Developer”* Web application (*om­dev*).

### “OpenMark Question Engine” Web application for preview environment (om­qe) properties

We have the following property to configure the “*OpenMark Question Engine*” Web application for preview environment (*om­qe*):

* + *om­qe.om­service*: Full name of the Java class used to implement the *‘Om’* web service. The default is: *om.qengine.uned.UnedOmService*

This property is not needed to be changed, except in advanced cases where we have another class to perform the operations of the *‘Om’* web service of the *“OpenMark Question Engine”* Web application for preview environment (*om­qe*).

### “OpenMark Test Navigator” Web application for preview environment (om­tn) properties

We have the following properties to configure the “*OpenMark Test Navigator*” Web application for preview environment (*om­tn*):

* + *om­tn.navigator­db­plugin*: Full name of the Java class used by the *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*) to generate the SQL sentences for database access. The default is: *om.tnavigator.db.postgres.uned.PostgreSQL*
  + *om­tn.trustedaddresses*: List of trusted IP addresses allowed to view server logs and status information (the separator character used is *comma*: *,* and IP addresses support ranges and the wildcard *\**, for example: *137.108.\*.\*,194.66.128-159.\**).
  + *om­tn.secureaddresses*: List of secure IP addresses from which it is possible to run system reports (the separator character used is *comma*: *,* and IP addresses support ranges and the wildcard *\**, for example: *137.108.\*.\*,194.66.128-159.\**).
  + *om­tn.navigator­auth­plugin*: Full name of the Java class used as implementation of user authentication within *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). The default is: *om.tnavigator.auth.uned.PreviewAuth*, which is a special implementation for preview environment that allows users with the required permission level to login as another user (without having to know the password).
  + *om­tn.questionengines*: List of URLs of *“Om”* web services of different *“OpenMark Question Engine”* Web applications to use. By default it is used the URL to access the *“Om”* web service of *“OpenMark Question Engine”* Web application for preview environment (*om­qe*), if for example the defined URL for that Web application is <http://localhost:8080/qe>, the URL used would be: <http://localhost:8080/qe/services/Om>
  + *om­tn.additional­testnavigators*: List of URLs of additional *“OpenMark Test Navigator”* Web applications to use. By default there are no others.
  + *om­tn.alertmail.from*: Email address used as sender of alert mails of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*).
  + *om­tn.alertmail.to*: List of email addresses used as recipients of alert mails of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*) (the separator character used is *comma*: ,).
  + *om­tn.alertmail.cc*: List of email addresses used as carbón copy of alert mails of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*) (the separator character used is *comma*: ,).
  + *om­tn.auth­session­expiry*: Maximum idle time before a user session of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*) expires. The default is *15 minutes* if you leave it empty. It can be defined in hours (eg. *2h*), in minutes (eg. *30m*) in seconds (eg. *45s*) or milliseconds (eg. *20000ms*).
  + *om­tn.mail.config*: Mail configuration string which allows to use one of the predefined configurations for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*): *‘Gmail’* (for Gmail email accounts), *‘Yahoo! Mail’* (for Yahoo! Mail email accounts) or *‘Hotmail’* (for Hotmail email accounts).
  + *om­tn.mail.username*: Username of the mail account of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). It can be left blank if there is no authentication required.
  + *om­tn.mail.password*: Password of the user from *‘om­tn.mail.username’* property of the mail account of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). It can be left blank if there is no authentication required.
  + *om­tn.mail.hostname*: Mail hostname of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). If using one of the predefined configurations it is not needed to assign a value to this property, unless you want to change the mail host.
  + *om­tn.mail.port*: Mail server port of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). By default it will be used the SMTP protocol port: *25*, except for the predefined configuration *‘Hotmail’* in which case it will be used port *587*.
  + *om­tn.mail.ssl*: Boolean flag to indicate whether to enable SSL protocol for mail (*true*) or not (*false*) for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). By default the SSL protocol is disabled, except for the predefined configurations *‘Gmail’* and *‘Yahoo! Mail’*.
  + *om­tn.mail.start­tls*: Boolean flag to indicate whether to start TLS protocol for mail (*true*) or not (*false*) for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). By default the TLS protocol is not started, except for the predefined configuration *‘Hotmail’*.
  + *om­tn.mail.debug*: Boolean flag to indicate whether to enable debug traces for mail (*true*) or not (*false*) for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). By default debug traces are disabled.
  + *om­tn.navigator­servlet*: Full name of the Java class used as servlet for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). The default is: *om.tnavigator.uned.PreviewNavigatorServlet*

It is not recommended to change Java classes used for database access, authentication or servlet, except if advanced modifications are required and there are alternative available classes that perform their operations properly.

As for IP list of trusted and secure IP addresses it is recommended to include only those IP addresses from which we will allow to run reports for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*).

Email addresses for alert mails are used for sending by mail the errors produced during execution of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*).

The maximum idle time for user sessions can be left with its default value of *15 minutes*. If you want to increase it you must keep in mind that even if the user session can last more than *15 minutes*, when you start a question, a specific session to that question is open, and that session expires after *15 minutes* even if the session user has not been expired yet.

As for the mail configuration properties when using a *Gmail*, *Yahoo! Mail* or *Hotmail* mail account it is recommended to use the default settings for them, otherwise it is required to configure the other mail settings.

In any case, if the mail account used requires authentication it is needed to set username and password for *‘om­tn.mail.username’* and *‘om­tn.mail.password’* properties.

### “OpenMark Question Engine” Web application for publication environment (om­qe­pro) properties

We have the following property to configure the “*OpenMark Question Engine*” Web application for publication environment (*om­qe­pro*):

* + *om­qe­pro.om­service*: Full name of the Java class used to implement the *‘Om’* web service. The default is: *om.qengine.uned.UnedOmService*

This property is not needed to be changed, except in advanced cases where we have another class to perform the operations of the *‘Om’* web service of the *“OpenMark Question Engine”* Web application for publication environment (*om­qe­pro*).

### “OpenMark Test Navigator” Web application for publication environment (om­tn­pro) properties

We have the following properties to configure the “*OpenMark Test Navigator*” Web application for publication environment (*om­tn­pro*):

* + *om­tn­pro.navigator­db­plugin*: Full name of the Java class used by the *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*) to generate the SQL sentences for database access. The default is: *om.tnavigator.db.postgres.uned.PostgreSQL*
  + *om­tn­pro.trustedaddresses*: List of trusted IP addresses allowed to view server logs and status information (the separator character used is *comma*: *,* and IP addresses support ranges and the wildcard *\**, for example: *137.108.\*.\*,194.66.128-159.\**).
  + *om­tn­pro.secureaddresses*: List of secure IP addresses from which it is possible to run system reports (the separator character used is *comma*: *,* and IP addresses support ranges and the wildcard *\**, for example: *137.108.\*.\*,194.66.128-159.\**).
  + *om­tn­pro.navigator­auth­plugin*: Full name of the Java class used as implementation of user authentication within *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). The default is: *om.tnavigator.auth.uned.GepeqAuth*
  + *om­tn­pro.questionengines*: List of URLs of *“Om”* web services of different *“OpenMark Question Engine”* Web applications to use. By default it is used the URL to access the *“Om”* web service of *“OpenMark Question Engine”* Web application for publication environment (*om­qe­pro*), if for example the defined URL for that Web application is <http://localhost:8080/qe-pro>, the URL used would be: <http://localhost:8080/qe-pro/services/Om>
  + *om­tn­pro.additional­testnavigators*: List of URLs of additional *“OpenMark Test Navigator”* Web applications to use. By default there are no others.
  + *om­tn­pro.alertmail.from*: Email address used as sender of alert mails of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*).
  + *om­tn­pro.alertmail.to*: List of email addresses used as recipients of alert mails of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*) (the separator character used is *comma*: ,).
  + *om­tn­pro.alertmail.cc*: List of email addresses used as carbón copy of alert mails of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*) (the separator character used is *comma*: ,).
  + *om­tn­pro.auth­session­expiry*: Maximum idle time before a user session of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*) expires. The default is *15 minutes* if you leave it empty. It can be defined in hours (eg. *2h*), in minutes (eg. *30m*) in seconds (eg. *45s*) or milliseconds (eg. *20000ms*).
  + *om­tn­pro.mail.config*: Mail configuration string which allows to use one of the predefined configurations for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*): *‘Gmail’* (for Gmail email accounts), *‘Yahoo! Mail’* (for Yahoo! Mail email accounts) or *‘Hotmail’* (for Hotmail email accounts).
  + *om­tn­pro.mail.username*: Username of the mail account of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). It can be left blank if there is no authentication required.
  + *om­tn­pro.mail.password*: Password of the user from *‘om­tn.mail.username’* property of the mail account of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). It can be left blank if there is no authentication required.
  + *om­tn­pro.mail.hostname*: Mail hostname of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). If using one of the predefined configurations it is not needed to assign a value to this property, unless you want to change the mail host.
  + *om­tn­pro.mail.port*: Mail server port of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). By default it will be used the SMTP protocol port: *25*, except for the predefined configuration *‘Hotmail’* in which case it will be used port *587*.
  + *om­tn­pro.mail.ssl*: Boolean flag to indicate whether to enable SSL protocol for mail (*true*) or not (*false*) for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). By default the SSL protocol is disabled, except for the predefined configurations *‘Gmail’* and *‘Yahoo! Mail’*.
  + *om­tn­pro.mail.start­tls*: Boolean flag to indicate whether to start TLS protocol for mail (*true*) or not (*false*) for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). By default the TLS protocol is not started, except for the predefined configuration *‘Hotmail’*.
  + *om­tn­pro.mail.debug*: Boolean flag to indicate whether to enable debug traces for mail (*true*) or not (*false*) for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). By default debug traces are disabled.
  + *om­tn­pro.navigator­servlet*: Full name of the Java class used as servlet for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). The default is: *om.tnavigator.uned.LogoutNavigatorServlet*

It is not recommended to change Java classes used for database access, authentication or servlet, except if advanced modifications are required and there are alternative available classes that perform their operations properly.

As for IP list of trusted and secure IP addresses it is recommended to include only those IP addresses from which we will allow to run reports for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*).

Email addresses for alert mails are used for sending by mail the errors produced during execution of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*).

The maximum idle time for user sessions can be left with its default value of *15 minutes*. If you want to increase it you must keep in mind that even if the user session can last more than *15 minutes*, when you start a question, a specific session to that question is open, and that session expires after *15 minutes* even if the session user has not been expired yet.

As for the mail configuration properties when using a *Gmail*, *Yahoo! Mail* or *Hotmail* mail account it is recommended to use the default settings for them, otherwise it is required to configure the other mail settings.

In any case, if the mail account used requires authentication it is needed to set username and password for *‘om­tn­pro.mail.username’* and *‘om­tn­pro.mail.password* properties.

### Libraries configuration properties

The OpenMark authoring tool consists of several Web applications and requires several libraries to compile source code and/or to deploy these Web applications.

All required libraries are included within *‘libs’* folder of the project.

But we wanted to give you freedom to be able to use a different version of a library if available and you believe that will not cause problems.

This can be useful if a problem arises for some bug in a library that has been corrected in later versions (as long as you keep backward compatibility with the above library).

All libraries used by *“OpenMark Authoring Tool”* Web application (*GEPEQ*) can be configured using 2 properties:

* + *<library>*.lib: Path where the library is located.
  + *<library>*.lib.name: Filename of the library.

On the other hand the other Web applications (belonging to OpenMark project) can be similarly configured by 2 properties:

* + om.*<library>*.lib: Path where the library is located.
  + om.*<library>*.lib.name: Filename of the library.

This distinction is made because there are cases in which it is used a different version of the same library for *“OpenMark Authoring Tool”* Web application (*GEPEQ*) with regard the other Web applications.

### “OpenMark Authoring Tool” Web application (GEPEQ) themes configuration properties

The *“OpenMark Authoring Tool”* Web application (*GEPEQ*) allows to modify at runtime the look and feel with themes, a functionality provided by Primefaces.

Primefaces comes installed with a default theme: *Aristo*

It it possible to use additional themes, but each one requires deploying its related library within *“OpenMark Authoring Tool”* Web application (*GEPEQ*).

This project includes by default the following themes: *Aristo*, *Blitzer*, *Bluesky*, *Casablanca*, *Cupertino*, *Eggplant*, *Excite­Bike*, *Flick*, *Glass­X*, *Hot­Sneaks*, *Overcast*, *Pepper­Grinder*, *South­Street*, *Sunny* and *UI-Ligthness*.

However it is possible to add additional themes, remove some of the existing ones, or use an updated version of them.

Themes can be configured with the following properties:

* + *themes*: List with the names of the themes included by default within Primefaces library. These themes do not require an additional library. However, for now only the *Aristo* theme fulfills this condition, so by default the value for this property is: *aristo*
  + *additional­themes*: List with the names of additional themes to include. Each of these themes requires to deploy its related library within *“OpenMark Authoring Tool”* Web application (*GEPEQ*). The default value for this property is: *blitzer,bluesky,casablanca,cupertino,eggplant,*

*excite­bike,flick,glass­x,hot­sneaks,overcast,pepper­grinder,south*­*street,*

*sunny,ui*­*lightness*

* + *themes.default*: Name of the theme to use by default within *“OpenMark Authoring Tool”* Web application (*GEPEQ*). It is Aristo, so by default the value for this property is: *aristo*

For every theme included within *‘themes’* and *‘additional­themes’* properties it is required to define the following property:

* + theme-*<theme-name*>.display-name: Name of the theme to display to the user.

Moreover, for every theme included within *‘additional­themes’* property it is also required to define the following properties:

* + theme­*<theme-name*>: Path where the library related to the theme is located.
  + theme­*<theme-name*>.name: Filename of the library related to the theme.

It is posible to find valid themes to download at: <http://repository.primefaces.org/org/primefaces/themes/>

So to add a new theme to *“OpenMark Authoring Tool”* Web application (*GEPEQ*), which you would make once you have its related library, is to add the name of that theme to the list of *‘additional­themes’* property and to set the 3 properties 'theme*­*<*theme­name*>.display*­*name', 'theme*­*<*theme­name*>' and 'theme*­*<*theme­name*>.name' related to the new theme.

### Encryption properties

The OpenMark authoring tool allows encrypting some fields within configuration files for security (preventing users with access to these configuration files to get passwords that they should not know).

It is important to note that the encryption algorithms used by the OpenMark authoring tool require to have installed files from the extension *“Java Cryptography Extension”* (*JCE*) for JDK 6, which can be downloaded from: <http://www.oracle.com/technetwork/java/javase/downloads/jce-6-download-429243.html>

One of the main advantages of building and installing the application with the file *‘build.xml’* regarding to the manual procedure is that you can set some properties so that the data encryption as well as keys and passwords generation are made automatically with Ant tasks and the encrypted output will be stored correctly within configuration files.

Encryption can be configured with the following properties:

* + *encryption.asymmetric*­*encryptor.tool*: Path where the tool for asymmetric encryption is located. The default is: *encryption*
  + *encryption.asymmetric­encryptor.tool.name*: Filename of the executable *‘.jar’* of the tool for asymmetric encryption. The default is: *asymmetric­encryptor.jar*
  + *encryption.symmetric*­*encryptor.tool*: Path where the tool for symmetric encryption is located. The default is: *encryption*
  + *encryption.symmetric*­*encryptor.tool.name*: Filename of the executable *‘.jar’* of the tool for symmetric encryption. The default is: *symmetric*­*encryptor.jar*
  + *encryption.password*­*digester.tool*: Path where the tool for password encryption is located. The default is: *encryption*
  + *encryption.password­digester.tool.name*: Filename of the executable *‘.jar’* of the tool for password encryption. The default is: *password­digester.jar*
  + *gepeq.encryption.enabled*: Boolean flag to indicate whether to enable (*true*) or not (*false*) the encryption for configuration files of *“OpenMark Authoring Tool”* Web application (*GEPEQ*). The default is: *false*
  + *gepeq.encryption.generate­keypair*: Boolean flag to indicate whether to generate (*true*) or not (*false*) a new asymmetric encryption key pair for *“OpenMark Authoring Tool”* Web application (*GEPEQ*). The default is: *false*
  + *gepeq.encryption.output*: Output path for files generated with the encryption tools for *“OpenMark Authoring Tool”* Web application (*GEPEQ*). The default is: *build/encryption/gepeq*
  + *gepeq.encryption.public­key*: Path where the file with the public encryption key for *“OpenMark Authoring Tool”* Web application (*GEPEQ*) is located. This property is used only when the value of *‘gepeq.encryption.generate­keypair’* property is *false*.
  + *gepeq.encryption.public­key.name*: Filename of the public encryption key for *“OpenMark Authoring Tool”* Web application (*GEPEQ*). The default is: *public.key*, a value that should not be changed because a different value for public encryption key is not supported yet.
  + *gepeq.encryption.private­key*: Path where the file with the private encryption key for *“OpenMark Authoring Tool”* Web application (*GEPEQ*) is located. This property is used only when the value of *‘gepeq.encryption.generate­keypair’* property is *false*.
  + *gepeq.encryption.private­key.name*: Filename of the private encryption key for *“OpenMark Authoring Tool”* Web application (*GEPEQ*). The default is: *private.key*, a value that should not be changed because a different value for private encryption key is not supported yet.
  + *hibernate.encryption*: Boolean flag to indicate whether to enable (*true*) or not (*false*) encryption for the Hibernate configuration file *‘hibernate.cfg.xml’* of *“OpenMark Authoring Tool”* Web application (*GEPEQ*). Keep in mind that even if you assign the value *true* to this property, properties of the Hibernate configuration file will be encrypted only if the value of *‘gepeq.encryption.enabled’* property is also *true* and there is a valid public encryption key in the expected path. The default is: *false*
  + *hibernate.connection.provider.class*: Full name of the Java class that adds encryption support for some properties of the Hibernate configuration file. This property is used only when the value of *‘hibernate.encryption’* property is *true*. The default value is: *es.uned.lsi. gepec.util.hibernate.EncryptedDriverManagerConnectionProvider*
  + *om­tn.encryption.enabled*: Boolean flag to indicate whether to enable (*true*) or not (*false*) encryption for the configuration files of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). The default is: *false*
  + *om­tn.encryption.generate­keypair*: Boolean flag to indicate whether to generate (*true*) or not (*false*) a new asymmetric encryption key pair for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). The default is: *false*
  + *om­tn.encryption.use­gepeq­keypair*: Boolean flag to indicate whether to use (*true*) or not (*false*) the same key pair of *“OpenMark Authoring Tool”* Web application (*GEPEQ*) for encryption of the configuration files of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). This property is used only if value of ‘*om­tn.encryption.generate­keypair*’ property is *false*. The default is: *false*
  + *om­tn.encryption.output*: Output path for files generated with the encryption tools for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). The default is: *build/encryption/om­tn*
  + *om­tn.encryption.public­key*: Path where the file with the public encryption key for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*) is located. This property is used only when the values of ‘*om­tn.encryption.generate­keypair*’ and *‘om­tn.encryption.use­gepeq­keypair’* properties are *false*.
  + *om­tn.encryption.public­key.name*: Filename of the public encryption key for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). The default is: *public.key*, a value that should not be changed because a different value for public encryption key is not supported yet.
  + *om­tn.encryption.private­key*: Path where the file with the private encryption key for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*) is located. This property is used only when the values of ‘*om­tn.encryption.generate­keypair*’ and *‘om­tn.encryption.use­gepeq­keypair’* properties are *false*.
  + *om­tn.encryption.private­key.name*: Filename of the private encryption key for *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). The default is: *private.key*, a value that should not be changed because a different value for private encryption key is not supported yet.
  + *om­tn.encryption.generate­password*: Boolean flag to indicate whether to generate (*true*) or not (*false*) a symmetric encryption password to use with some arguments of the web services of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). The default is: *false*
  + *om­tn.encryption.password*: Symmetric encryption password to use with some arguments of the web services of *“OpenMark Test Navigator”* Web application for preview environment (*om­tn*). This property is used only when the value of *‘om­tn.encryption.generate­password’* property is *false*.
  + *om­tn­pro.encryption.enabled*: Boolean flag to indicate whether to enable (*true*) or not (*false*) encryption for the configuration files of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). The default is: *false*
  + *om­tn­pro.encryption.generate­keypair*: Boolean flag to indicate whether to generate (*true*) or not (*false*) a new asymmetric encryption key pair for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). The default is: *false*
  + *om­tn­pro.encryption.use­gepeq­keypair*: Boolean flag to indicate whether to use (*true*) or not (*false*) the same key pair of *“OpenMark Authoring Tool”* Web application (*GEPEQ*) for encryption of the configuration files of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). This property is used only if value of ‘*om­tn­pro.encryption.generate­keypair*’ property is *false*. The default is: *false*
  + *om­tn­pro.encryption.output*: Output path for files generated with the encryption tools for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). The default is: *build/encryption/om­tn­pro*
  + *om­tn­pro.encryption.public­key*: Path where the file with the public encryption key for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*) is located. This property is used only when the values of ‘*om­tn­pro.encryption.generate­keypair*’ and *‘om­tn­pro.encryption.use­gepeq­keypair’* properties are *false*.
  + *om­tn­pro.encryption.public­key.name*: Filename of the public encryption key for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). The default is: *public.key*, a value that should not be changed because a different value for public encryption key is not supported yet.
  + *om­tn­pro.encryption.private­key*: Path where the file with the private encryption key for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*) is located. This property is used only when the values of ‘*om­tn­pro.encryption.generate­keypair*’ and *‘om­tn­pro.encryption.use­gepeq­keypair’* properties are *false*.
  + *om­tn­pro.encryption.private­key.name*: Filename of the private encryption key for *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). The default is: *private.key*, a value that should not be changed because a different value for private encryption key is not supported yet.
  + *om­tn­pro.encryption.generate­password*: Boolean flag to indicate whether to generate (*true*) or not (*false*) a symmetric encryption password to use with some arguments of the web services of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). The default is: *false*
  + *om­tn­pro.encryption.password*: Symmetric encryption password to use with some arguments of the web services of *“OpenMark Test Navigator”* Web application for publication environment (*om­tn­pro*). This property is used only when the value of *‘om­tn­pro.encryption.generate­password’* property is *false*.

## Build and Install example with build.xml file

Let's say you downloaded the project on the path *‘C:\gepeq’* of a Windows operating system (on a Linux system the procedure would not change too much).

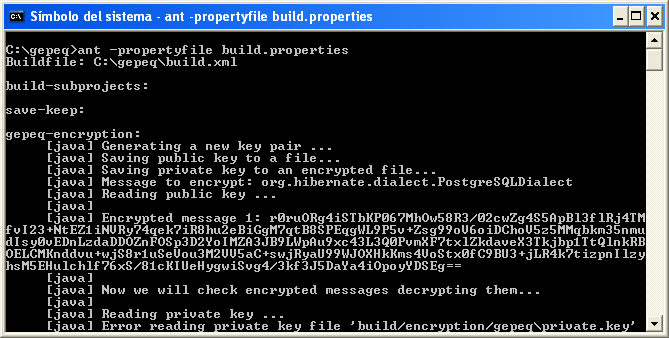
The first thing you do is to create a *‘build.properties’* file in that same folder to configure the needed properties, for example:



Then you just have to invoke Apache Ant from the command line indicating to load the created *‘build.properties’* file.

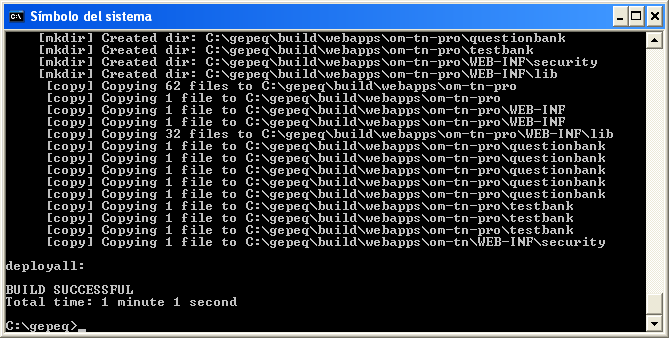
Do it with the following command (to make it work it is necessary that the *PATH* environment variable is set with the folder where Apache Ant executable is located):

*ant ­propertyfile build.properties*

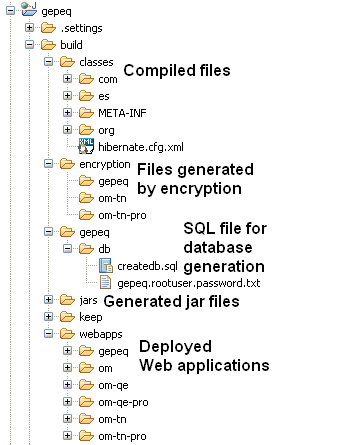


Installation takes a while because the source code must be compiled, some data and passwords should be encrypted if encryption is enabled, and finally, when deploying Web applications it is needed to copy the required libraries.

Once finished if everything has gone right, it will be displayed the message *‘BUILD SUCESSFUL’* followed by the time used by the process:



As already explained in the previous sections, it is possible to configure the target folder as wanted, in this example all the files has been generated within the *‘build’* subfolder of the project:



Obviously this is just an example, to properly install OpenMark authoring tool you must deploy Web applications within the folder *‘webapps’* of your Apache Tomcat server (deploying Web applications directly there by setting the output folders with properties or copying Web applications later to that path).

# Databases setup

Even if you already have deployed successfully the Web applications, you still need to setup databases.

Obviously you must use the same connection data that you had configured to run *‘build.xml’*.

To get the required SQL file to create database for OpenMark authoring tool (*gepeq*) is important to have assigned the value *‘true’* to *‘gepeq.createdb.enabled’* property before running *‘build.xml’*.

## OpenMark Authoring Tool database (gepeq) setup

To install the database used by OpenMark authoring tool you must run with PostgreSQL the SQL script created to generate the database after running *‘build.xml’* file with Apache Ant.

By default the name of this file is *‘createdb.sql’* and can be found at the folder *‘build/gepeq/db’*.

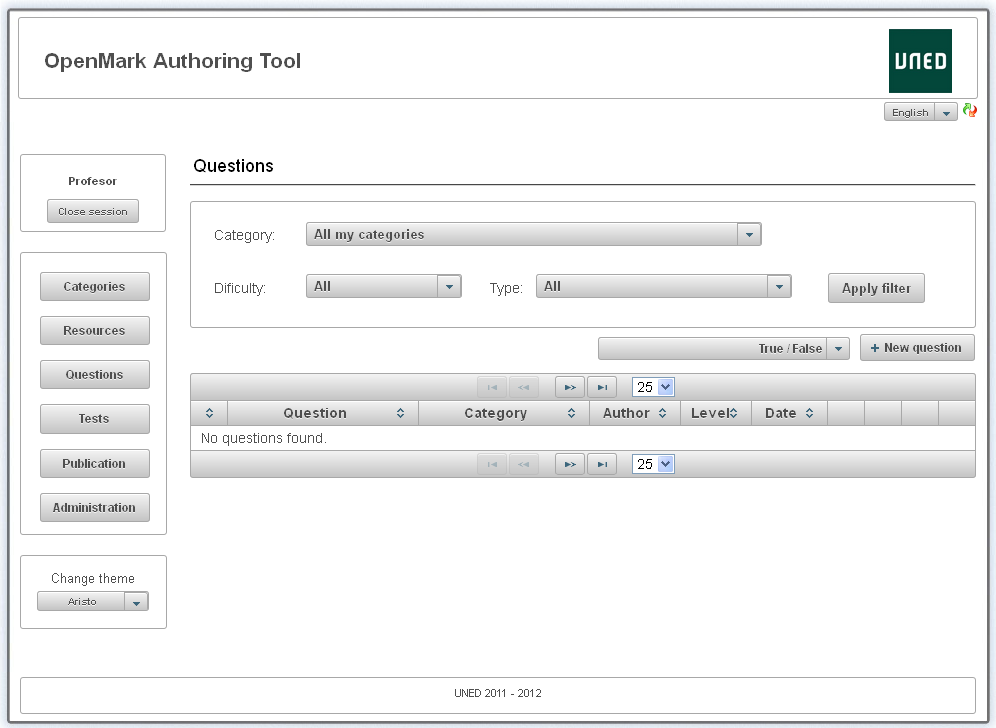
If you have successfully installed the database, and once you have restarted the Apache Tomcat server, you should now be able to login from the home page of OpenMark authoring tool with the identity and password defined by *‘gepeq.rootuser.login’* and *‘gepeq.rootuser.password’* properties.

By default, if these properties have not been set, it is possible to login as:

**User**: profesor

**Password**: profesor

Doing so displays the *‘Questions’* page of OpenMark authoring tool (there should be no questions):



## “OpenMark Test Navigator” Web applications (om­tn and om­tn­pro) databases setup

*“OpenMark Test Navigator”* Web applications for preview environment (*om­tn*) and for publication environment (*om­tn­pro*) use their own database to store user progress and tests results.

All the structure of tables for such databases is generated automatically the first time you access the related *“OpenMark Test Navigator”* Web application.

The only requirements for generating databases correctly are that such databases exist and the data connection provided for them within *‘build.xml’* file is correct.