EUROPEAN COMMISSION
DIRECTORATE-GENERAL
INFORMATICS
Information systems Directorate

European Commission

e-Invoicing and e-Ordering project for Public Procurement

Open e-PRIOR Installation Guide

Date:	30/04/2010
Version:	1.1
Authors:	Rubino Fausto, Marco Fichera
Revised by:	
Approved by:	
Public:	
Reference Number:	

Table of Contents

Document History

Version	Date	Comment	Modified Pages
1.000	28/01/2010	First Release	All pages
1.1	30/04/2010	Second Release	7,8,9,10,12

1. INTRODUCTION

This document describes how to prepare the installation for the Open e-PRIOR application. Open e-PRIOR is provided with a preconfigured environment ready to run. This document is for system administrators who want to install Open e-PRIOR into an existing environment.

This document is divided into the following sections:

(1) *Planning*: provides a high-level planning about the installation process;

(2) *System Requirements*: describes the hardware and software required to complete the installation;

(3) *Installation*: describes the detailed steps of the installation process;

(4) System verification: describes the necessary steps in order to verify the correctness of the system installation.

In order to be familiar with the terms used in this document and before going on with the installation, read the Appendix 2 – Terms used in this document section.

2. PLANNING

This section of the document provides a first overview on the installation tasks.

The required steps for the installation are described below:

(1) Make sure you have acquired all of the required packages and software to go ahead with the installation. For more information about the required packages and software see "System Requirements chapter";

(2) Decide which database management system you want to use for Open e-PRIOR. Open e-PRIOR was tested on Oracle database 10g Express edition and HSQL database ver.1.8;

(3) Prepare the computer on which you want to install Open e-PRIOR, checking if it respects the requirements;

(4) Follow the steps described in the Installation chapter in order to install Open e-PRIOR;

(5) Check the correctness of the installation running basic tests on the application.

3. SYSTEM REQUIREMENTS

This chapter describes the hardware and software requirements that the system must satisfy in order to install Open e-PRIOR.

3.1. Hardware requirements

The hardware requirements for the Open e-PRIOR installation depend on several factors, above all on availability and scalability requirements (number of documents to be exchanged, number of concurrent users, required SLAs, etc.). Therefore, they are tightly connected to the specific context in which Open e-PRIOR will be used. For this reason this section describes only the minimum hardware requirements to let Open e-PRIOR run.

Open e-PRIOR can be installed and used on any operating system that supports Java. Therefore your target machine must be able to support the chosen operating system.

The minimum system requirements are the following:

- 512 MB RAM;
- 400 MHz CPU;
- 500 MB hard disk space.

3.2. Software requirements

This section describes which software is required in order to install Open e-PRIOR on your system.

3.2.1. *Java virtual machine*

You must have a working installation of **JDK 1.5 or higher** before you can install correctly the whole environment in which Open e-PRIOR can run. You can install the 32-bit or 64-bit JVM as per your requirements. Open e-PRIOR was tested using **JDK 1.6**. You can download the JDK following the link in the Appendix 1 – useful links.

3.2.2. *Operating System*

Because Open e-PRIOR is Java-based, it is cross-platform and can be installed and used on any operating system that supports Java.

3.2.3. *Application Server*

In order to run Open e-PRIOR, a Java EE application server is required.

Open e-PRIOR was tested using JBoss ver. 5.0.1 as Java EE application server.

The integration of JBPM workflow engine with JBoss is also required.

You can download the JBoss application server and jBPM ver. 4.0 following the link in the Appendix 1 – useful links.

3.2.4. *Databases*

Open e-PRIOR requires two different logical databases. It needs an application database, used to store data directly generated by the application, and a process database used by jBPM workflow engine to store data concerning asynchronous processes executions.

Open e-PRIOR was tested on HSQL Database ver. 1.8 and Oracle 10g Express Edition and database installation scripts are provided for these two platforms. You can download the database installation scripts following the link in the Appendix 1 – Useful links.

You can choose to install the Open e-PRIOR database and the jBPM database either on Oracle or on HSQLDB.

You can download Oracle 10g Express edition and HSQL Database server following the link in the Appendix 1 – useful links.

3.2.5. *Additional software*

JBossWS (Required)

Open e-PRIOR needs the JBoss WS Metro implementation of the JAX WS Web Service stack specification. Please refer to Additional required libraries section to download and install the implementation.

Apache Ant 1.8 (Required)
Apache Ant is a Java-based build tool. It is required in order to configure correctly the system.

SoapUI (Optional)

In order to check the correctness of the Open e-PRIOR installation, a web service testing tool is required.

Open e-PRIOR was tested using SoapUI web service testing tool.

You can download SOAPUI, Apache ant 1.8 and JBossWS implementations following the link in the Appendix 1 – useful links.

4. INSTALLATION

4.1. Installing and configuring JBoss for Open e-PRIOR

This section describes how to install and configure JBoss application server.Configuring environment

After you have downloaded the zipped file containing the JBoss environment, you must extract the archive contents into a location of your choice. It would be better if the directory path name didn't contain spaces. In order to start correctly JBoss the following environment variables must be set:

- *JAVA_HOME*: environment variable that points to the JDK installation folder;
- *JBOSS_HOME:* environment variable that points to the JBoss installation directory.

4.1.1. Configuring message queues

Since Open e-PRIOR is based on message exchange, it needs some JMS queues to be configured.

In detail you must create the following queues:

- *documentQueue*;
- *invoiceDocumentQueue*;
- *processQueue*;
- *backendOutQueue*;
- *backendInQueue;*
- *jmsInterfaceInQueue;*
- *jmsInterfaceOutQueue;*

In order to create the abovementioned queues under JBoss, these steps have to be followed:

- Create a file named *eprior-service.xml* in the <JBOSS_HOME>/server/default/deploy folder;
- For each queue to be created, add a *<mbean>* node in the xml file as shown below:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<server>
 <!--
    An mbean node must be created for each queue to configure. QUEUE_NAME must be replaced with the name of the queue to create.
    The queues names to create are the following: documentQueue, invoiceDocumentQueue, processQueue, backendOutQueue,
    backendInQueue, jmsInterfaceInQueue, jmsInterfaceOutQueue
 -->
  <mbean code="org.jboss.jms.server.destination.QueueService"
name="jboss.messaging.destination:service=Queue,name=QUEUE_NAME"
   xmbean-dd="xmdesc/Queue-xmbean.xml">
  <depends optional-attribute-name="ServerPeer">jboss.messaging:service=ServerPeer</depends>
   <depends>jboss.messaging:service=PostOffice</depends>
 </mbean>
```

```
</server>
```

JAAS (Java Authentication and Authorization Service) is used by Open e-PRIOR to implement Authentication and Authorization mechanisms.

In order to configure correctly the security under JBoss, the following steps must be carried out:

- Open the file *login-config.xml* under the *<JBOSS_HOME>/server/default/conf* directory;
- Add a *<application-policy>* node as shown below:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<policy>
……………………….
  <application-policy name = "epriorRealm">
    <authentication>
     <login-module
            code="org.jboss.security.auth.spi.DatabaseServerLoginModule"
            flag = "required">
            <module-option name="dsJndiName">
                java:/jdbc/epriorAuth
            </module-option>
            <module-option name="principalsQuery">
                SELECT USR_PASSWORD FROM EPR_VW_ALLUSERS WHERE USR_NAME=?
            </module-option>
            <module-option name="rolesQuery">
                SELECT USR_TYPE,'Roles' FROM EPR_VW_ALLUSERS WHERE USR_NAME=?
            </module-option>
            <module-option name="hashAlgorithm">SHA-1</module-option>
            <module-option name="hashEncoding">base64</module-option>
     </login-module>
    </authentication>
  </application-policy>


  <application-policy name = "centralCatalogueRealm">
   <authentication>
     <login-module code="org.jboss.security.auth.spi.DatabaseServerLoginModule" flag = "required">
       <module-option name="dsJndiName">
         java:/JbpmDS
       </module-option>
       <module-option name="principalsQuery">
         SELECT USR_PASSWORD FROM CAT_TB_AUTH_USER WHERE USR_USER=?
       </module-option>




       <module-option name="rolesQuery">
```

```
        SELECT R.ROL_ROLE_NAME,'Roles'
                          FROM CAT_TB_AUTH_ROLE R
                          INNER JOIN CAT_TB_AUTH_USER_ROLES UR ON R.ROL_ID = UR.URS_ROL_ID
                          INNER JOIN CAT_TB_AUTH_USER U ON UR.URS_USR_ID = U.USR_ID
                          WHERE U.USR_USER =?
      </module-option>
      <module-option name="hashAlgorithm">SHA-1</module-option>
      <module-option name="hashEncoding">base64</module-option>
    </login-module>
  </authentication>
 </application-policy>
……………………….
</ policy>
```

This configuration uses a JDBC data source to connect to the database. To configure it correctly see configuring data sources section.

Open e-PRIOR's PEPPOL Access Point uses X.509 V3 certificates to establish HTTPS connections and to sign and validate message signatures. Therefore, keystores and truststores cointaning certificates must be configured on the JBoss Server. To configure the stores, please follow the steps below:

- Generate an X.509 V3 certificate (or use your own certificate if you already have one) and import it in a java keystore file named keystore.jks. Choose "peppol" as keystore password. You can use Java keytool for this purpose.

- Import the certificates of the Access Points (or the clients) which you want to receive messages from into a java keystore file named truststore.jks. Choose "peppol" as truststore password. You can use Java keytool for this purpose.

- Put the previously created keystore.jks and truststore.jks in the following directory (create it if it doesn't exist):

    <JBOSS_HOME>/server/default/conf/keystores

- Configure JBoss Server to listen on a HTTPS port (8443 in the configuration below, but you can use another port if you need), by adding the following xml fragment to JBoss server.xml file (<JBOSS_HOME>/server/default/deploy/jbossweb.sar/server.xml):

```
<!-- SSL/TLS Connector configuration-->
<Connector protocol="HTTP/1.1" SSLEnabled="true"
        port="8443" address="${jboss.bind.address}"
        scheme="https" secure="true" clientAuth="false"
        keystoreFile="${jboss.server.home.dir}/conf/keystores/keystore.jks"
        keystorePass="peppol" sslProtocol = "TLS"
        truststoreFile="${jboss.server.home.dir}/conf/keystores/truststore.jks"
        truststorePass="peppol"/>
```

4.1.3. _Installing and configuring jBPM_

This section describes how to install and configure jBPM. Since the jBPM distribution provides ant installation scripts, you'll need apache ant version 1.7 or higher in order to run them. You can download apache ant following the link in the [Appendix 1 – useful links](#).

After you have downloaded the zipped file containing jBPM, you must extract the archive contents into a location of your choice.

The distribution contains the follows ant scripts:

- _${jbpm.home}/jboss/build.xml_

- _${jbpm.home}/db/build.xml_

- _${jbpm.home}/gpd/build.xml_

- _${jbpm.home}/examples/build.xml_

In order to run these scripts correctly, you must create a properties file, named _build.properties_, under the _${user.home}/.jbpm4_ directory. The .jbpm4 directory has to be created if it does not exist. The _build.properties_ file must contain the following values:

jbpm.home=<directory containing the jbpm distribution>

database=<database that will be used by jBPM>

jboss.version=5.0.1

jboss.home=<directory containing the jboss distribution>

The property named _database_ identifies which database you want jBPM to use. The default value is _hsqldb_. Alternative values are _mysql_, _oracle_ and _postgresql_. After you have chosen the database to use, the appropriate properties file in the _${jbpm.home}/install/jdbc_ folder must be edited. The _${jbpm.home}/install/jdbc_ folder contains the following files:

- _hsqldb.properties_: loaded if the _database_ property is set to _hsqldb;_

- _mysql.properties_: loaded if the _database_ property is set to _mysql;_

- _oracle.properties_: loaded if the _database_ property is set to _oracle;_

- _postgresql.properties_: loaded if the _database_ property is set to _postgresql._

The abovementioned files contain the following properties to set:

jdbc.driver=driver class used to access to the database;

jdbc.url=jdbc connection url;

jdbc.username=username used to access to the database;

jdbc.password=password used to access to the database

Open e-PRIOR was tested with jBPM using either the HSQLDB database or the Oracle Database.

After having created and edited the properties files, the following steps have to be carried out:

- Open the command shell and change the current working directory to <jBPM_DISTRIBUTION_DIR>/jboss;

- Run the following ant commands:

  o _ant install.jbpm.into.jboss_

  o _ant start.jboss_

- Change the current working directory to <jBPM_distribution_dir>/db;

- Run the following ant command:
    - *ant create.jbpm.schema*

4.1.4. *Additional required libraries*

Open e-PRIOR needs JBossWS Metro ver. 3.2.2.GA to be installed. You can download JbossWS Metro following the link in the <u>Appendix 1 – useful links</u>.

In order to install correctly JBossWS Metro libraries under JBoss, the following steps must be followed:

- Download the archive containing the JBossWS Metro distribution and unzip it in a directory of your choice;
- Copy *ant.properties.examples* to *ant.properties* and change the following properties:
    - *jboss501.home="root directory containing the Jboss installation"*
    - *jbossws.integration.target=jboss501*
- Open the command shell and change the current working directory to the JbossWS Metro directory;
- Run the follow ant command:
    - ant deploy-jboss501

Since Open e-PRIOR's PEPPOL Access Point uses some features of Java Metro 2.0, some libraries of the JBoss Metro implementation have to be replaced with Metro 2.0 compliant ones. For this purpose, please follow these steps:

- Dowload from the <u>Open e-PRIOR OSOR site</u> download section the libraries FastInfoset.jar and xws-security.jar (in Modified WS libraries for jboss.zip) .
- Replace the FastInfoset.jar file inside

    <JBOSS_HOME>/server/default/deployers/jbossws.deployer

    with the one previously downloaded.
- Replace the xws-security.jar file inside

    <JBOSS_HOME>/server/default/deployers/jbossws.deployer   **and**

    <JBOSS_HOME>/client

    with the one previously downloaded.

4.2. Installing and configuring Databases

This section of the document describes how to use the provided installation scripts in order to install the Open e-PRIOR database. The included scripts enable you to install the database for the first time either on Oracle or on HSQLDB.

Notes:

(1)   Installation scripts were tested on Oracle 10g Express edition and HSQLDB 1.8;

(2)   This document does not cover the Oracle and HSQLDB installation procedure;

(3)   Scripts have to be run on the same computer where the database server is installed;

(4) The steps described in the 4.2.1 and 4.2.2 sections must be executed depending on the database choice.

4.2.1. *HSQLDB environment configuration (optional)*

In order to run the installation scripts on HSQLDB, these steps must be carried out:

- Copy the file *sqltool.rc* in the user home directory;

- Edit the *sqltool.rc* file in order to set the urlid, database URL, username and password to connect to the database server;

- Edit the *setenv.bat* batch file and set the HSQL_DB_URLID and JBOSS_HOME_DIR environment variables. HSQL_DB_URLID identifies the urlid defined in the *sqltool.rc* file. JBOSS_HOME_DIR identifies the Jboss root directory. Make sure that the <JBOSS_HOME_DIR>/common/lib/ folder contains the *hsqldb.jar* file.

4.2.2. *Oracle environment configuration (optional)*

In order to run the installation scripts on Oracle, these steps must be carried out:

- Create an Oracle User used to create the Open e-PRIOR tables.

- Edit the *setenv.bat* batch file and set the ORACLE_SQLPLUS_DIR, ORACLE_EPRIOR_USER and ORACLE_EPRIOR_PWD environment variables. ORACLE_SQLPLUS_DIR identifies the BIN folder inside the Oracle installation containing the *sqlplus.exe* file. ORACLE_EPRIOR_USER and ORACLE_EPRIOR_PWD identify respectively the username and password of the user created in the previous step.

After having configured the environment, the database installation scripts can be run. The steps described in 4.3.3 or in 4.3.4 must be followed depending on the DBMS choice.

4.2.3. *HSQLDB scripts execution*

In order to create correctly the Open e-PRIOR database on HSQLDB, open a command shell pointing to the folder, named OpenePRIOR and CentralCatalogue, containing the batch files and execute them in the following order:

- *hsqlRunCreateTablesScripts.bat*: creates the tables used by Open e-PRIOR;

- *hsqlRunInsertScripts.bat:* populates some tables used by the Open e-PRIOR.

In addition to these commands, there are other useful batch files which can be used to connect, drop or clean up the database:

- *hsqlConnect.bat*: connects to the HSQL database server;

- *hsqlRunDeleteScript.bat*: empties the tables out;

- *hsqlRunDropTablesScripts.bat*: drops the tables used by Open e-PRIOR application;

- *hsqlRunCreateJbpmTablesScripts.bat*: creates the tables used by the JBPM engine;

- *hsqlRunDropJbpmTablesScripts.bat*: drops the tables used by the JBPM engine.

4.2.4. *Oracle scripts execution*

In order to create correctly the Open e-PRIOR database on Oracle, open a command shell pointing to the folder, named OpenePRIOR and CentralCatalogue, containing the batch files and execute them in the following order:

- *oracleRunCreateTablesScripts.bat*: creates the tables used by Open e-PRIOR;

- *oracleRunInsertScripts.bat:* populates some tables used by the Open e-PRIOR.

In addition to these commands, there are other useful batch files which can be used to drop or clean up the database:

- *oracleRunDeleteScripts.bat*: empties the tables out;

- *oracleRunDropTablesScripts.bat*: drops the tables used by Open e-PRIOR application.

- *oracleRunCreateJbpmTablesScripts.bat*: creates the tables used by the JBPM engine;

- *oracleRunDropJbpmTablesScripts.bat*: drops the tables used by the JBPM engine.

4.2.5. *Configuring data sources*

This section describes how to configure data sources in order to allow Open e-PRIOR to access to the database. Since HSQLDB ver.1.8 does not support XA transactions, you can't configure XA data sources if you choose to adopt HSQLDB as application database management system. For this reason, different data sources must be configured depending on the database choice.

In detail the following data sources must be configured:

- *ePriorAuth*: data source used by JAAS for authenticate and authorize users. This data source must be configured either for Oracle or HSQLDB;

- *jbpmDS*: data source used by jBPM to store data generated by the processes execution. This data source is configured automatically when jBPM is installed;

- *ePrior*: data source used by Open e-PRIOR to have access to the application database. This data source must be created only if you choose to use Oracle. This data source must be configured in the same way *ePriorAuth* data source is configured. The only difference is that *ePrior* data source must be declared XA.

Oracle data sources configuration

To configure data sources using Oracle database, this steps must be followed:

- Create a file named *eprior-ds.xml* under the *<JBOSS_HOME>/server/default/deploy* folder;

- Create *ePriorAuth* and *ePrior* data sources as shown below:

```xml
<?xml version="1.0" encoding="utf-8"?>
<datasources>
 <local-tx-datasource>
  <jndi-name>jdbc/epriorAuth</jndi-name>
  <connection-url>ORACLE_CONNECTION_URL</connection-url>
  <driver-class>oracle.jdbc.driver.OracleDriver</driver-class>
  <user-name> ORACLE_USER</user-name>
  <password> ORACLE_PASSWORD</password>
  <min-pool-size>5</min-pool-size>
  <max-pool-size>100</max-pool-size>
  <exception-sorter-class-name>org.jboss.resource.adapter.jdbc.vendor.OracleExceptionSorter</exception-sorter-class-name>
  <metadata>
   <type-mapping>Oracle9i</type-mapping>
  </metadata>
 </local-tx-datasource>
 <xa-datasource>
  <jndi-name>jdbc/eprior</jndi-name>
  <isSameRM-override-value>false</isSameRM-override-value>
  <xa-datasource-class>oracle.jdbc.xa.client.OracleXADataSource</xa-datasource-class>
  <xa-datasource-property name="URL"> ORACLE_CONNECTION_URL </xa-datasource-property>
  <xa-datasource-property name="User"> ORACLE_USER </xa-datasource-property>
  <xa-datasource-property name="Password"> ORACLE_PASSWORD </xa-datasource-property>
  <exception-sorter-class-name>org.jboss.resource.adapter.jdbc.vendor.OracleExceptionSorter</exception-sorter-class-name>
  <no-tx-separate-pools />
  <metadata>
   <type-mapping>Oracle9i</type-mapping>
  </metadata>
 </xa-datasource>
 <mbean code="org.jboss.resource.adapter.jdbc.vendor.OracleXAExceptionFormatter"
name="jboss.jca:service=OracleXAExceptionFormatter">
  <depends optional-attribute-name="TransactionManagerService">jboss:service=TransactionManager</depends>
 </mbean>
</datasources>
```

HSQLDB data sources configuration

To configure data sources using HSQL database, this steps must be followed:

- Create a file named *eprior-ds.xml* under the *<JBOSS_HOME>/server/default/deploy* folder;

- Create *ePriorAuth* data source as shown below:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<datasources>
 <local-tx-datasource>
  <jndi-name>jdbc/epriorAuth</jndi-name>
  <connection-url>jdbc:hsqldb:hsql://localhost:1701</connection-url>
  <driver-class>org.hsqldb.jdbcDriver</driver-class>
  <user-name>sa</user-name>
  <password></password>
  <min-pool-size>1</min-pool-size>
  <max-pool-size>20</max-pool-size>
  <idle-timeout-minutes>0</idle-timeout-minutes>
  <track-statements />
  <prepared-statement-cache-size>32</prepared-statement-cache-size>
  <metadata>
   <type-mapping>Hypersonic SQL</type-mapping>
  </metadata>
  <depends>jboss:service=Hypersonic,database=epriorDB</depends>
 </local-tx-datasource>


 <mbean code="org.jboss.jdbc.HypersonicDatabase" name="jboss:service=Hypersonic,database=epriorDB">
  <attribute name="Database">epriorDB</attribute>
  <attribute name="InProcessMode">true</attribute>
 </mbean>
</datasources>
```

5. DEPLOYING OPEN e-PRIOR

After having configured all of the resources described in the previous chapters, you can deploy Open e-PRIOR onto the JBoss application server.

Open e-PRIOR is distributed as an EAR (Enterprise Archive). An enterprise archive is a file format used for packaging one or more modules into a single archive so that the deployment of the various modules onto an application server happens simultaneously and coherently.

In order to deploy Open e-PRIOR you must follow these steps:

- Download the Open e-PRIOR distribution from the following link:
  http://forge.osor.eu/frs/download.php/770/OpenEPrior_Binary_JBoss.zip

- Download the Central Catalogue module distribution from the following link:

  http://forge.osor.eu/frs/download.php/1251/CentralCatalogueEAR.ear

- Download the preconfigured JBOSS application server from the following link:

  http://forge.osor.eu/frs/download.php/1252/OpenEpriorEar.ear

- Unzip the archive into a folder of your choice;

- Copy the Open e-PRIOR EAR archive into your configured JBoss under the *<JBOSS_HOME>/server/default/deploy* folder.

- Copy the Central Catalogue EAR archive into your configured JBoss under the *<JBOSS_HOME>/server/default/deploy* folder.

- Start JBoss.

6. VERIFYING THE SYSTEM

After having completed the installation of the whole system, different test cases must be carried out in order to verify the correctness of the installation.

A test suite was created to reach this aim. The test suite contains a detailed documentation describing all the steps to be executed to verify the installation.

You can download the Open e-PRIOR test suite from the following URL:

http://forge.osor.eu/frs/download.php/771/OpenEPrior_TestSuite.zip

7. APPENDIX 1 – USEFUL LINKS

- Download JDK:

http://java.sun.com/javase/downloads/index_jdk5.jsp

- Download JBoss 5.0.1:

http://sourceforge.net/projects/jboss/files/JBoss/JBoss-5.0.1.GA/jboss-5.0.1.GA.zip/download

- Download JBPM 4.0:

http://sourceforge.net/projects/jbpm/files/a%29%20jBPM%204/jbpm-4.0/jbpm-4.0.zip/download

- Download Oracle 10g Express Edition:

http://www.oracle.com/technology/software/products/database/xe/htdocs/102xewinsoft.html

- Download HSQLDB ver. 1.8:

http://sourceforge.net/projects/hsqldb/files/hsqldb/hsqldb_1_8_1/hsqldb_1_8_1_1.zip/download

- Download SOAPUI web service testing tool:

http://sourceforge.net/projects/soapui/files/soapui/3.0.1

- Download apache ant version 1.8:

http://apache.belnet.be/ant/binaries/apache-ant-1.8.0RC1-bin.zip

- Download JbossWS Metro 3.2.2.GA:

http://labs.jboss.com/jbossws/downloads.html

- Download JbossWS Native 3.2.2.GA:

http://labs.jboss.com/jbossws/downloads.html

- Download Apache Ant 1.8

http://ant.apache.org/bindownload.cgi

- Download the database installation scripts for Open e-PRIOR

http://forge.osor.eu/frs/?group_id=188&release_id=378

8. APPENDIX 2 – TERMS USED IN THIS DOCUMENT

Oracle database 10g Express	Oracle Database 10*g* Express Edition (Oracle Database XE) is a database based on the Oracle Database 10*g* Release 2 code base that's free to develop, deploy, and distribute.
HSQLDB	HSQLDB (HyperSQL Database) is the SQL relational database engine written in Java.
Data source	A data source is a Java Naming and Directory Interface (JNDI) object used to obtain a connection from a connection pool to a database.
jBPM	jBPM is a workflow engine written in Java that can execute processes described in BPEL or its own process definition language jPDL.
JMS	The Java Message Service (JMS) API is a messaging standard that allows application components based on the Java 2 Platform Enterprise Edition (J2EE) to create, send, receive, and read messages. It enables distributed communication that is loosely coupled, reliable, and asynchronous.
JAAS	JAAS (Java Authentication and Authorization Service) is a java extension with the following purposes: • *Authentication* of users; • *Authorization* of users to ensure they have the access control rights (permissions) required to do the actions performed.
EAR	An Enterprise ARchive is a file format used for packaging one or more modules into a single archive so that the deployment of the various modules onto an application server happens simultaneously and coherently
JAVA_HOME	JDK root installation directory
JBOSS_HOME	JBoss root installation directory
user.home	Home directory of the current user logged in the operating system
jBPM_DISTRIBUTION_DIR	Directory in which the jBPM archive was unzipped