



# Fuego Enterprise 5.5 for JBoss Installation Instructions

Installation and Configuration Guide  
Fuego v5.5

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## Fuego Enterprise 5.5 for JBoss Installation Instructions

### Introduction

The following document will describe all the steps to install and configure Fuego Enterprise 5.5 for JBoss 3.2. It will as well explain how to deploy a Fuego Project implemented in Fuego's Studio on the Fuego Engine deployed on JBoss's Application Server.

### Minimal Requirements

Fuego 5.5 Enterprise for JBoss runs on JBoss 3.2.x (latest version is recommended). The latest versions contain corrections and patches needed for optimal and correct behavior.

### Installing Fuego 5.5 Enterprise for JBoss

#### *Configuring the Fuego Directory Service*

After Fuego 5.5 Enterprise for JBoss has been successfully installed on your system, the Fuego Administrator will need to proceed with the configuration and setup of the environment to run a Fuego Engine on JBoss's Application Server to execute Business Processes modeled on Fuego's Studio.

Fuego's Server for JBoss relies on a Directory Service to enforce Business Process Security as well as using it as a centralized repository for Fuego's Metadata.

Before proceeding with anything else, the Fuego Administrator will need to create the Directory Service. In our example, the Fuego Administrator will deploy Fuego's Directory Service on an Oracle 9i RDBMS. Analogous procedure should be followed when deploying Fuego's Directory Service on another RDBMS or LDAP compliant Directory Service.

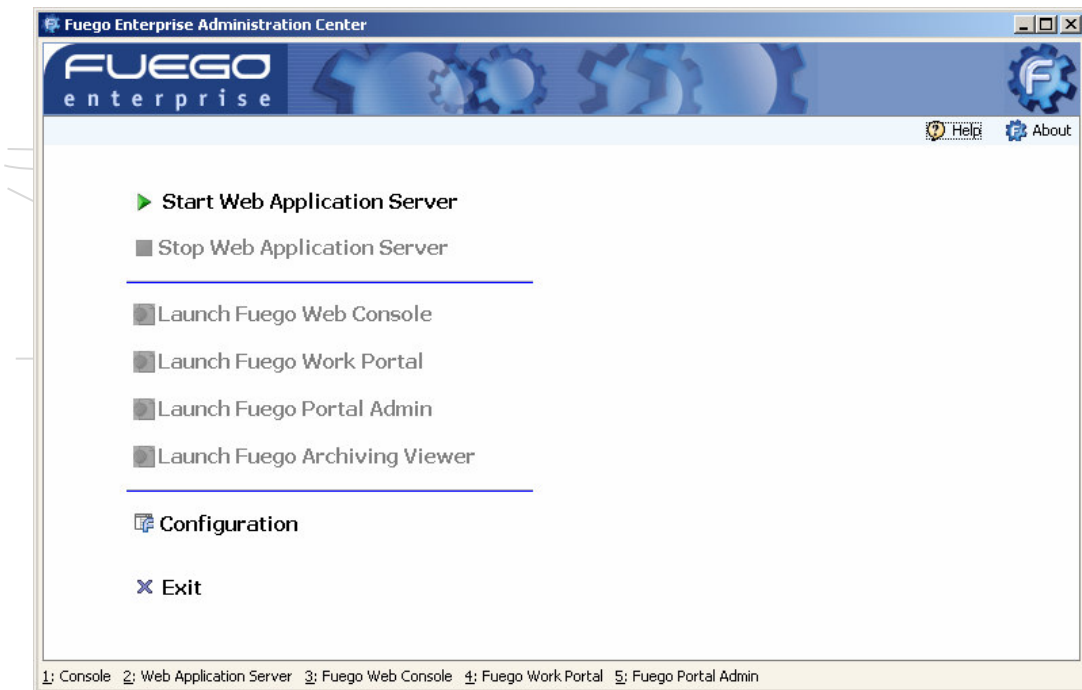
### Creating Fuego's Directory Service

Fuego Enterprise 5.5 for JBoss provides a desktop application for creating Fuego's Directory Service. This application is Fuego's Admin Center. The application may be launched using the shortcuts created at installation time. On Windows, the default

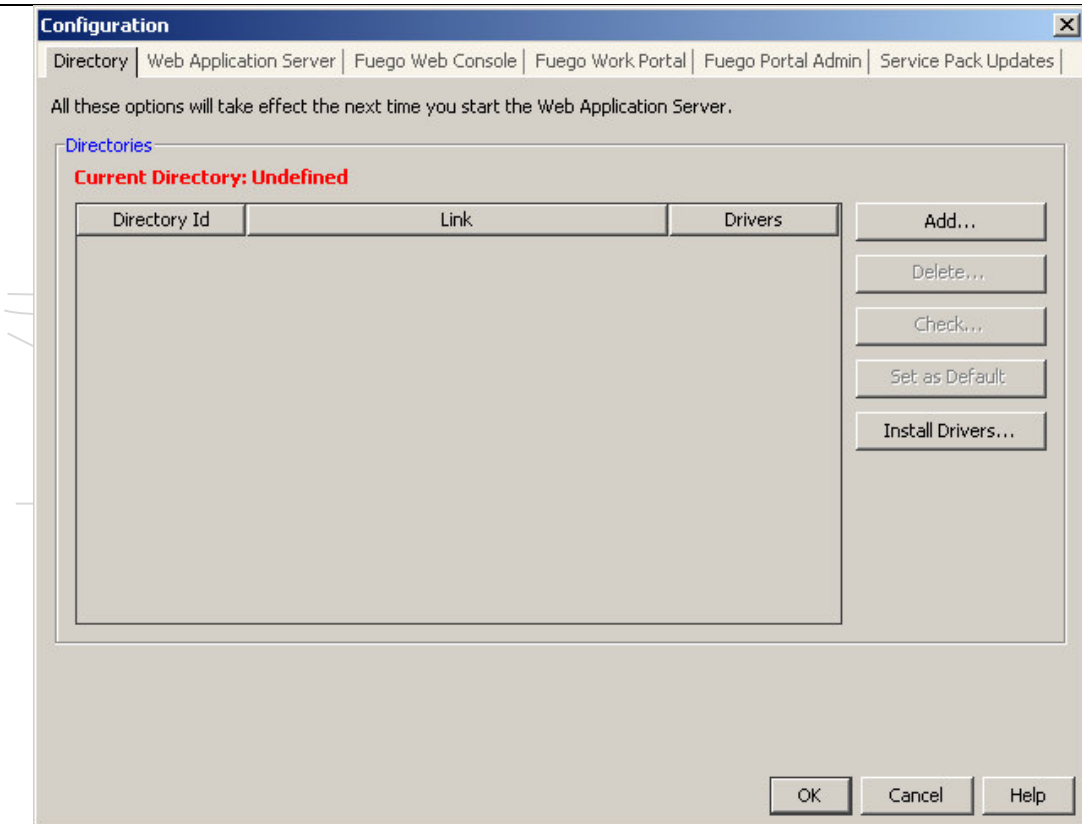
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path to the Admin Center shortcut is: Start -> Programs -> Fuego 5.5 for JBoss -> Fuego Adm Center.

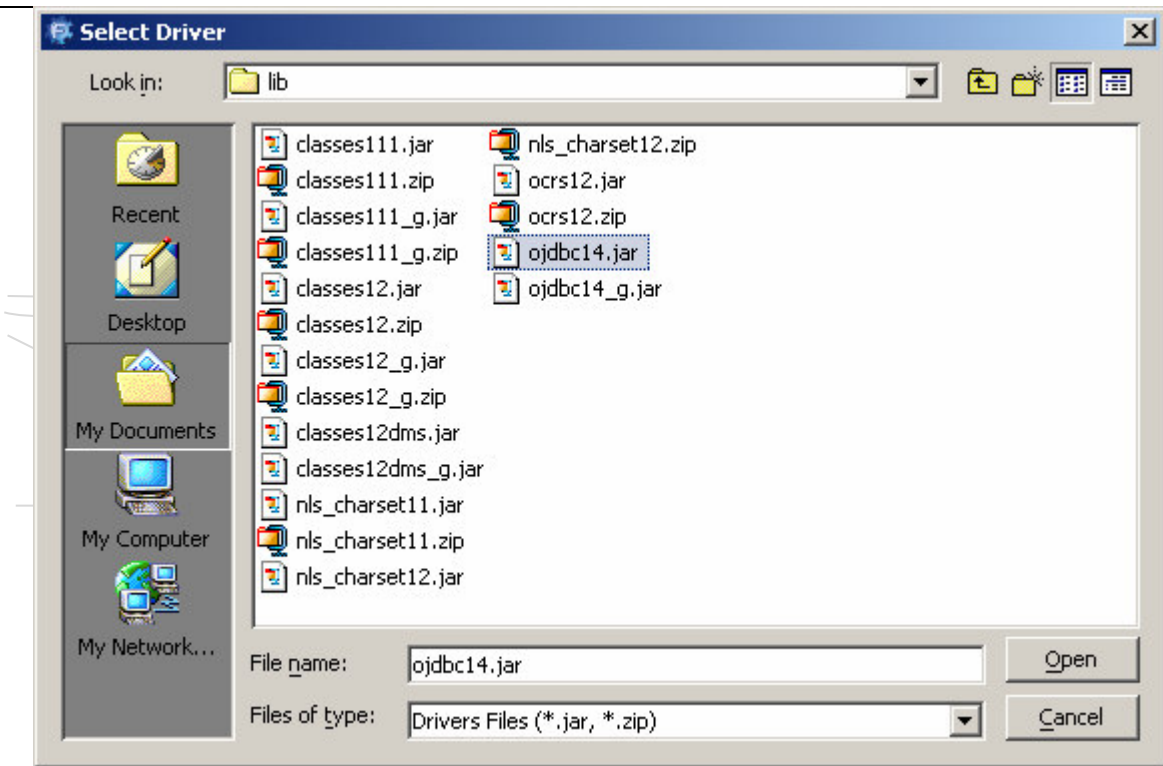
The following panel will be presented when Fuego's Adm Center is launched.



To proceed with the Fuego Directory Service configuration, click on the "Configuration" link at the bottom of the Panel. The following Panel is displayed.

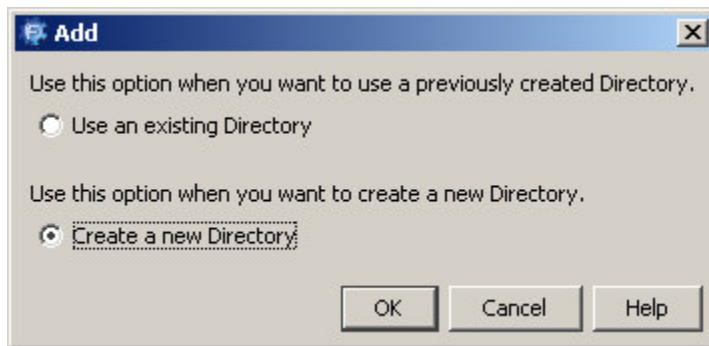


As the Directory Service will be deployed on Oracle 9i, the appropriate JDBC Driver needs to be installed. Click on the “Install Drivers...” button to proceed with the installation of Oracle 9i’s JDBC Driver. The Fuego Administrator will need to navigate through the Computer’s Hard disk looking for the file containing the JDBC Driver classes as depicted in the figure below.

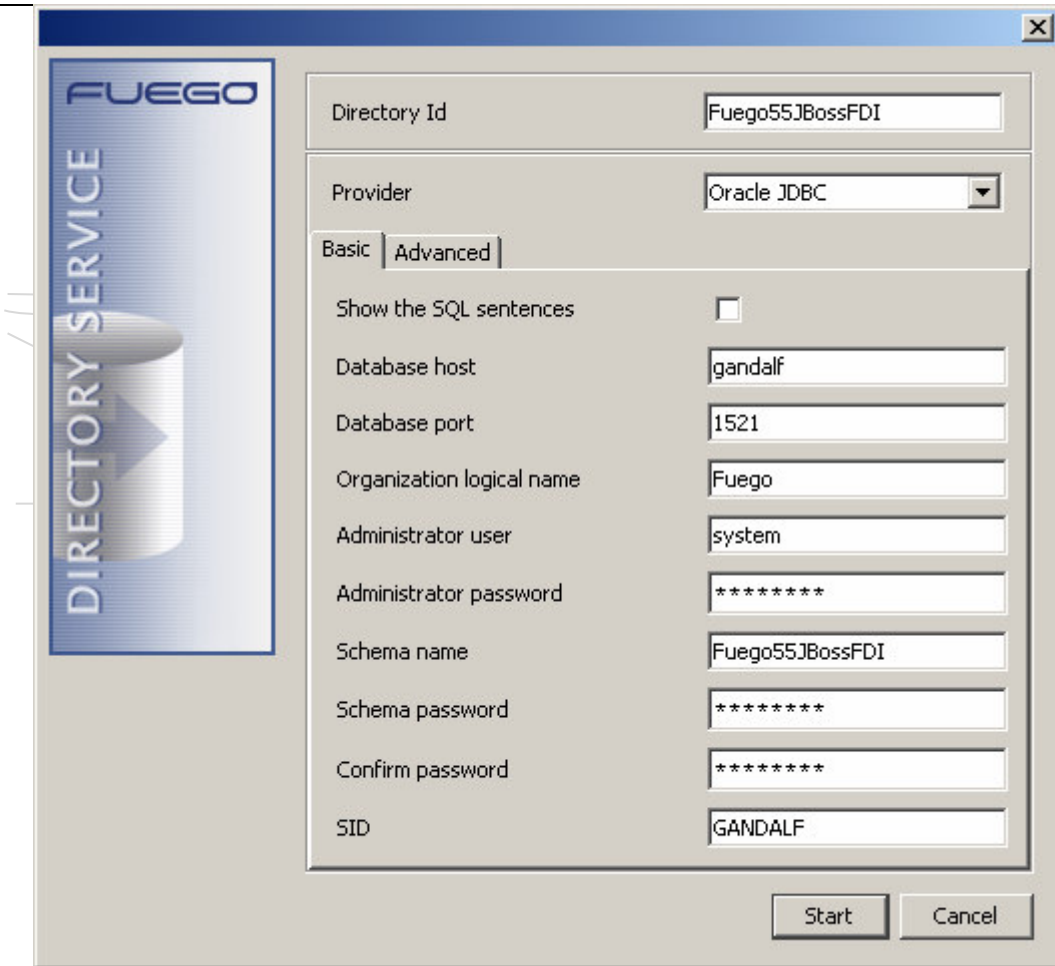


Click on the “Open” button to proceed.

To start creating the Directory Service, click on the “Add” button on the “Directory” Tab. The following dialog will be presented to decide whether a new Directory Service should be created or not. As we will be creating a new Directory Service on Oracle 9i, the Fuego Administrator will need to select the “Create a New Directory” option.



Click “Ok” to proceed. A new panel will be presented requiring specific values to be provided to configure the Directory Service to be used by the Fuego Enterprise 5.5 Server deployed on JBoss. The following figure illustrates the panel. A brief explanation is provided for each form field. For more information check the Fuego’s FDI for Oracle Documentation.



The following is a brief description of each one of the fields in the form:

**Directory Id:** This is a logical name for the Directory Service. It can be any name.

**Provider:** As Oracle 9i is the target for the Directory Service, the entry “Oracle JDBC” should be selected from the drop down.

**Show the SQL sentences:** It should be checked if the Administrator wants to get the SQL Script executed to create the Directory Service Database structure. In our case, we will let Fuego’s Adm Center to create it so it should be unchecked.

**Database host:** This is the host where the Oracle 9i is deployed.

**Database port:** Oracle’s JDBC Driver connects with Oracle 9i using TCP/IP’s protocol. The TCP/IP used by the MS SQL Server to receive incoming calls should be provided in this field. 1521 is the default TCP/IP for Oracle 9i.

**Organization logical name:** This is the logical name of the Organization being created with this Directory Service. This can be any literal. It is usually the name of the company that has bought Fuego.

**Administrator user:** This is Oracle’s Administrator user. This is a user with enough permission to create a Database, a Login and tables on the created Directory Service Database.

**Administrator password:** This is the password for the Administrator user specified in the previous field.

**Schema Name:** This is the name of the Schema in the Oracle 9i Instance that will contain the FDI tables. This will be the same name used to create the Oracle User that will contain the FDI tables.

**Login Password:** This is the password for the Schema Name specified in the previous field.

**Confirm Password:** This is the same value provided in the “Schema Password” field. It is just for consistency when providing passwords as its value is not visualized to the Administrator entering the password.

Now, we will turn to the “Advanced” Tab. The values in this Tab will help us define the data for the Fuego Directory Service Administrator. Below, a list of the fields with a brief description is provided.

**Administrator ID:** This is the Fuego Directory Service Administrator’s ID. This is the user id to be used when connecting to Fuego’s Web Console to administer and manage Fuego Engines as well as publishing and deploying projects.

**Administrator password:** This is the password to be linked to the Fuego Directory Service Administrator ID.

**Confirm password:** This is the same value provided in the “Administrator password” field.

**Fuego handles authentication:** This is the preferred authentication mechanism since all Fuego Business Process participants will be persisted in the Directory Service Database. If this checkbox is not selected, the authentication will rely on Oracle’s 9i Database authentication. For more information refer to the Oracle FDI Instructions.

**Tablespace:** The Fuego Administrator can decide in which tablespace the tables for the FDI tables will reside.

**Temporary Tablespace:** The Fuego Administrator can decide in which tablespace the temporary structures related to the FDI Users should reside.

**Profile:** The Fuego Administrator can associate an Oracle profile to the FDI User being created.

The panel below shows the “Advanced” panel.



The screenshot shows a configuration window for the Fuego Directory Service. The window is titled 'FUEGO' and has a close button in the top right corner. On the left side, there is a vertical banner with the FUEGO logo and the text 'DIRECTORY SERVICE'. The main area of the window contains several configuration fields and tabs. The 'Basic' tab is selected, and the 'Advanced' tab is also visible. The fields are as follows:

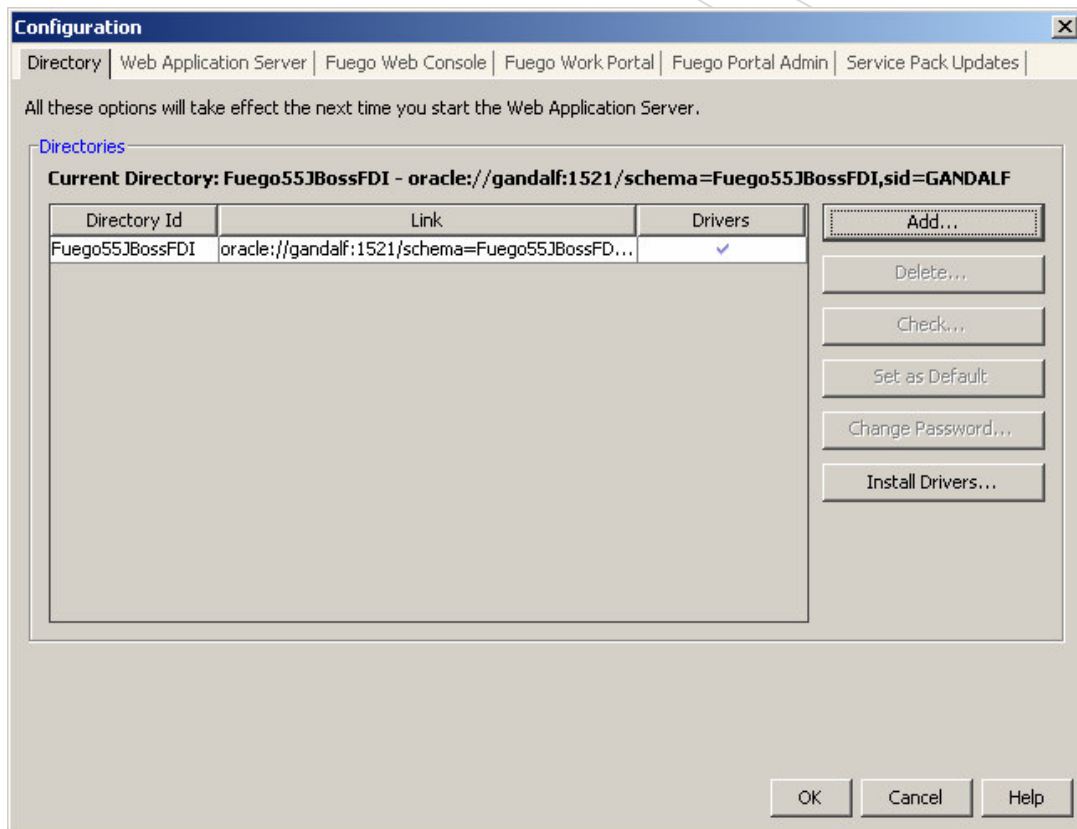
- Directory Id:** Fuego55JBossFDI
- Provider:** Oracle JDBC
- Administrator ID:** root
- Administrator password:** masked with asterisks
- Confirm password:** masked with asterisks
- Fuego handles authentication:** checked
- Tablespace:** empty
- Temporary Tablespace:** empty
- Profile:** empty

At the bottom right of the window, there are two buttons: 'Start' and 'Cancel'.

Click on the “Start” button to start the Fuego Directory Service creation. After a successful Directory Service creation, the following dialog will be presented.



Click on the “Close” button to finish the Directory Service creation. The new created Directory Service will be displayed as a new entry on the “Directory” Tab as follows. It is important to note that this one is as well the default Directory Service.

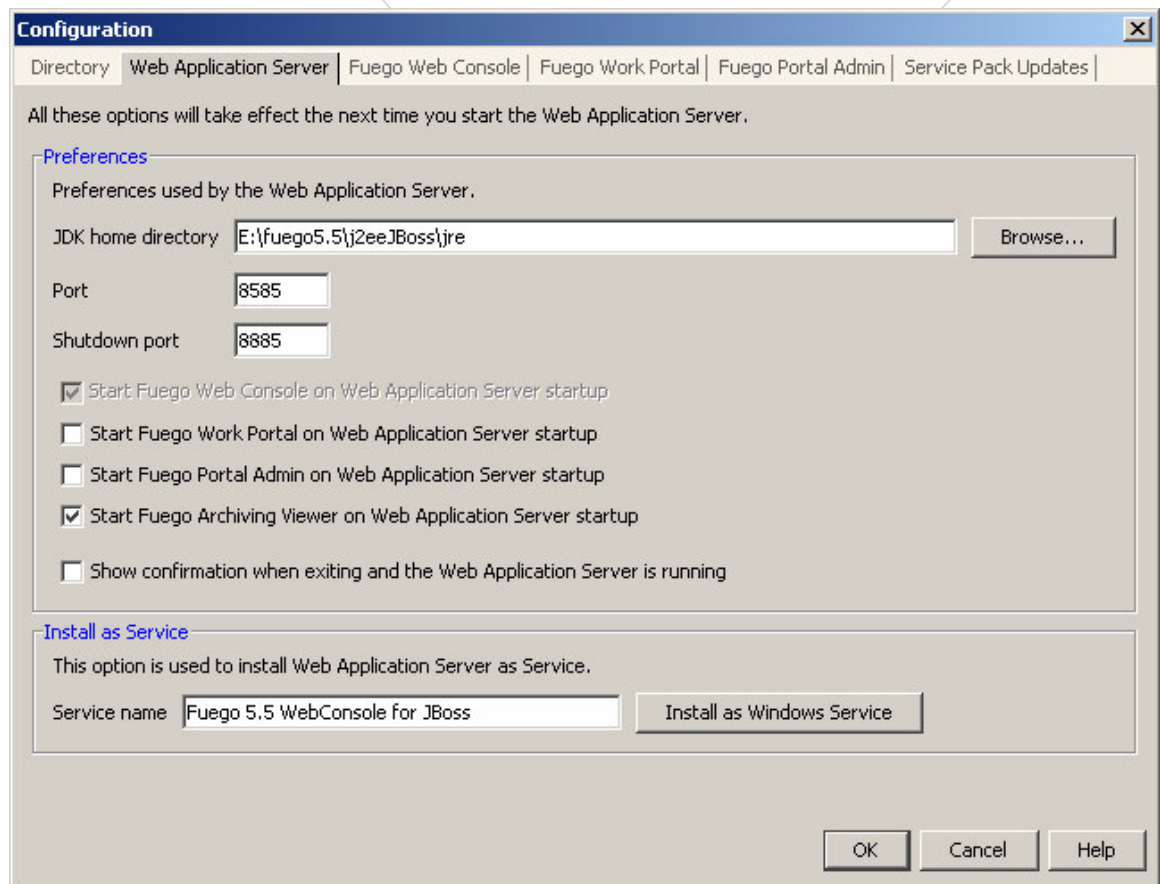


## Configuring Fuego Web Application Server for Web Console deployment

After successfully creating the Fuego Directory Service, it is convenient the Admin Service is installed as Windows Service. The Admin Service starts a Tomcat embedded Web Server with Fuego's Web Console deployed on it. Installing it as a Windows Service enforces the Fuego Web Console automatically started.

It is important to remark that the Web Console will be used to generate the EAR files to deploy on JBoss' Application Server.

To install the Web Console as a Windows Service, the Fuego Administrator should select the "Web Application Server" Tab on the Configuration Panel as shown below.



**Configuration**

Directory | **Web Application Server** | Fuego Web Console | Fuego Work Portal | Fuego Portal Admin | Service Pack Updates

All these options will take effect the next time you start the Web Application Server.

**Preferences**

Preferences used by the Web Application Server.

JDK home directory:

Port:

Shutdown port:

☒ Start Fuego Web Console on Web Application Server startup

☐ Start Fuego Work Portal on Web Application Server startup

☐ Start Fuego Portal Admin on Web Application Server startup

☒ Start Fuego Archiving Viewer on Web Application Server startup

☐ Show confirmation when exiting and the Web Application Server is running

**Install as Service**

This option is used to install Web Application Server as Service.

Service name:

This panel defines the Web Console configuration parameters. The following list provides a brief description of the form fields.

**JDK home directory:** This field contains the absolute path to a 1.4.2 JVM. By default and on Windows, it is pointing to the one provided and installed by Fuego

**Port:** This is the port used by the Web Console embedded Tomcat. 8585 is the default port used by Fuego.

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**Shutdown port:** This is the port used internally to stop the Web Console embedded Tomcat. 8885 is the default port used by Fuego.

**Start Fuego Work Portal on Web Application Server startup:** This checkbox should be unselected since the Fuego Portal will be deployed on JBoss' Application Server later with the Fuego Engine deployment.

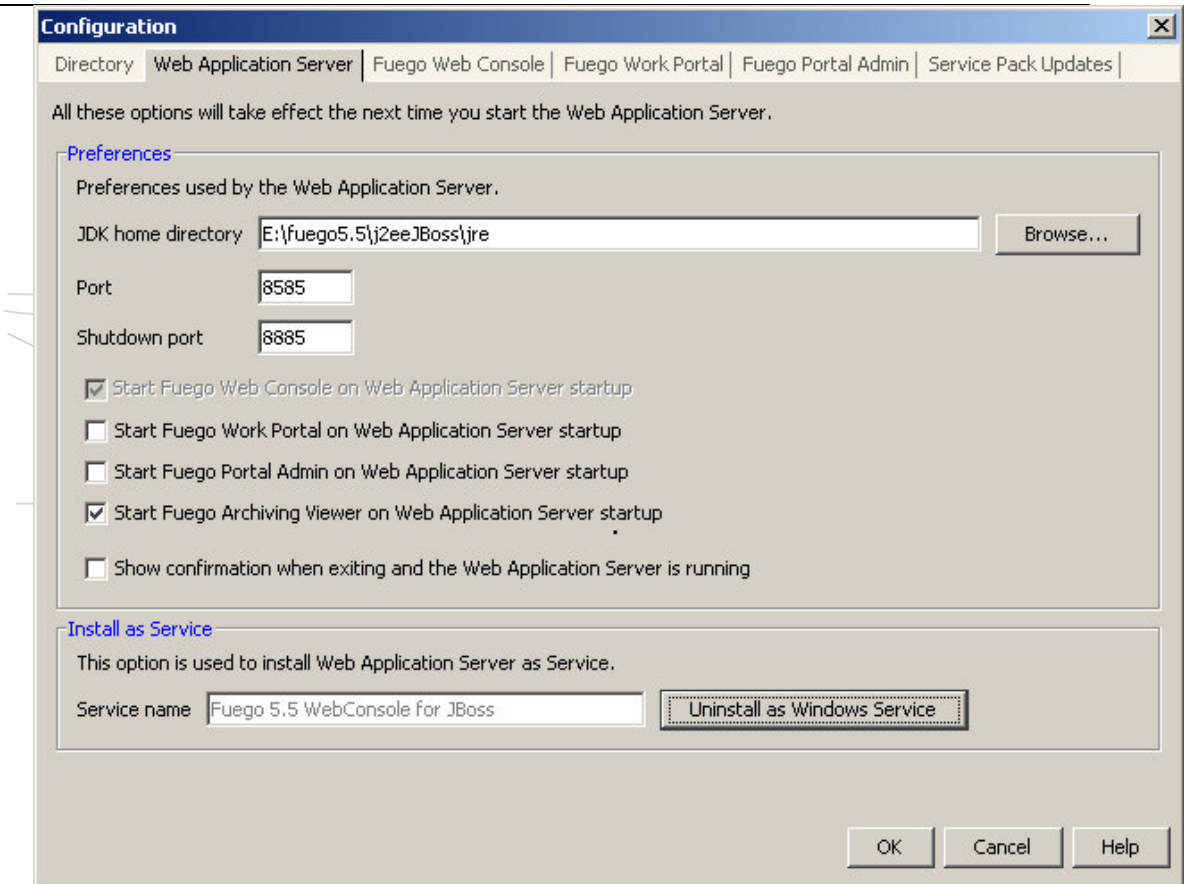
**Start Fuego Portal Admin on Web application Server startup:** This checkbox should be unselected since the Fuego Portal Admin will be deployed on JBoss' Application Server later with the Fuego Engine deployment.

**Start Fuego Archiving Viewer on Web Application Server startup:** This checkbox should be unselected since the Fuego Portal will be deployed on JBoss' Application Server later with the Fuego Engine deployment.

**Show confirmation when exiting and the Web Application Server is running:** This checkbox should be unselected so that a warning is not displayed when exiting Fuego Admin Center and the Web Application Server is running.

**Service Name:** This is the name of the Windows Service to be granted to the Fuego Web Console Service. It is a good idea to provide a name different than the default one. As Fuego Enterprise 5.5 for JBoss has been installed, "Fuego WebConsole 5.5 for JBoss" is an appropriate name.

Once the configuration for the Web Application Server has been defined, the Fuego Administrator should install the Web Console Windows Service by clicking on the "Install as Windows Service" button. After a successful installation, the "Service Name" field should be grayed out as depicted in the figure below.



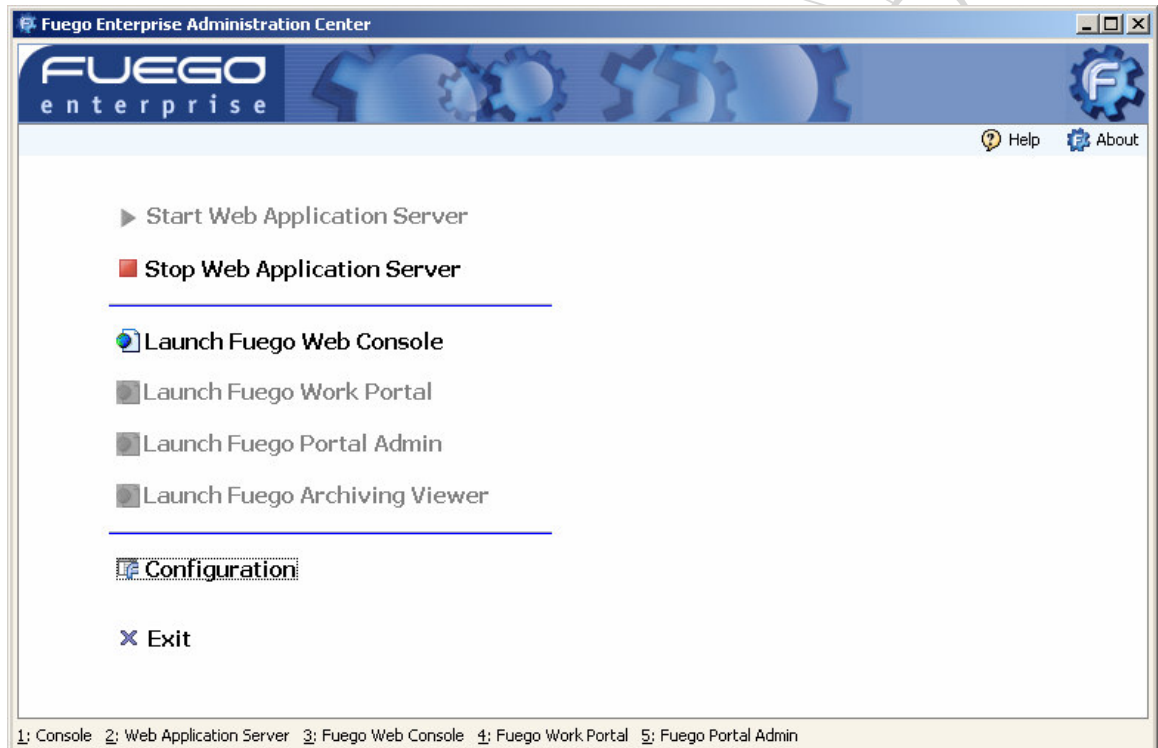
Unless specific configuration for logging is required, it is not necessary to go through the other Tabs in the Configuration Panel. Click “Ok” on the “Web Application Server” Tab Panel to finish the Web Console Configuration.

## Starting Fuego’s Web Console Windows Service

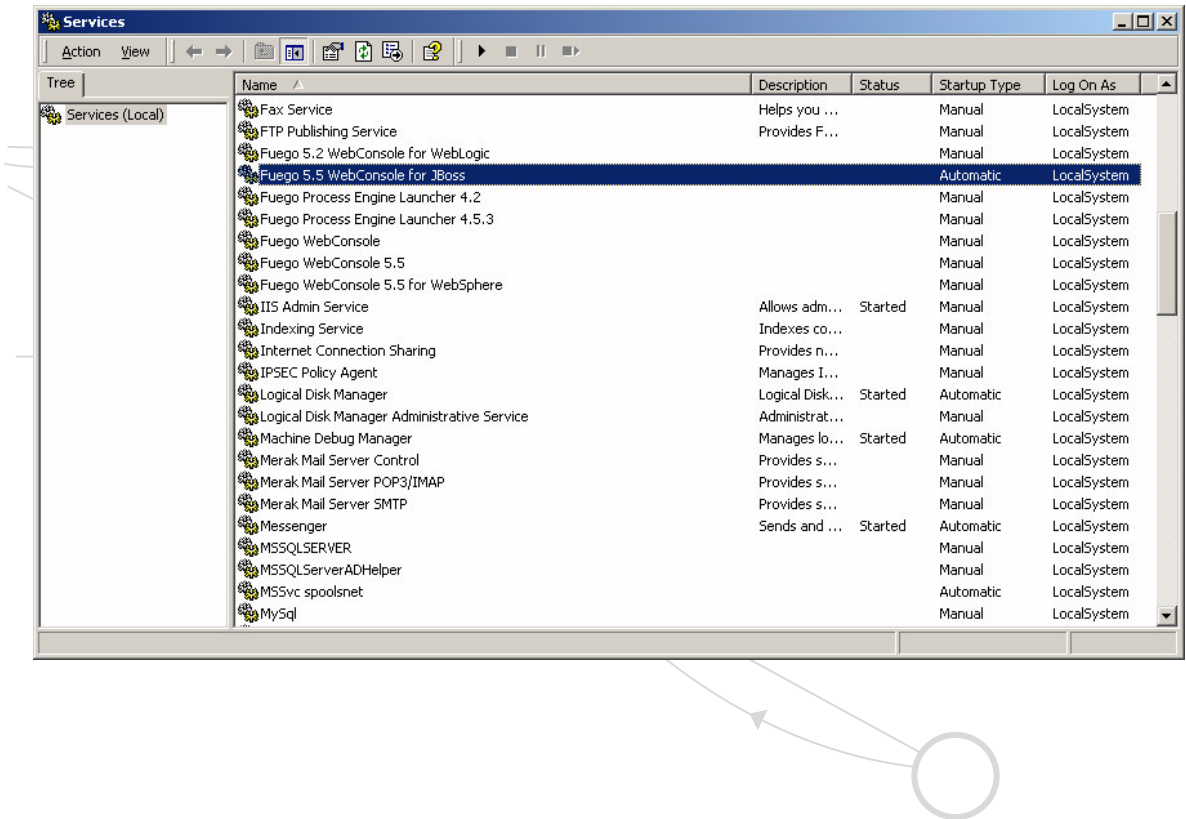
Once the Web Console has been configured, the Fuego Administrator should start the Service. This can be done through Fuego’s Adm Center application or simply by starting the previously created Windows Server. If the Web Console Service is started from Fuego’s Adm Center application, the Windows Service will be automatically started. Click on the “Start Web Application Server” link on the main Fuego Adm Center Panel as shown below.



The main panel should look like the one below after a successful Web Console Service startup.



The Fuego Administrator may also want to check the Web Console Windows Service was properly started by checking the Windows Services Panel as depicted in the figure below.

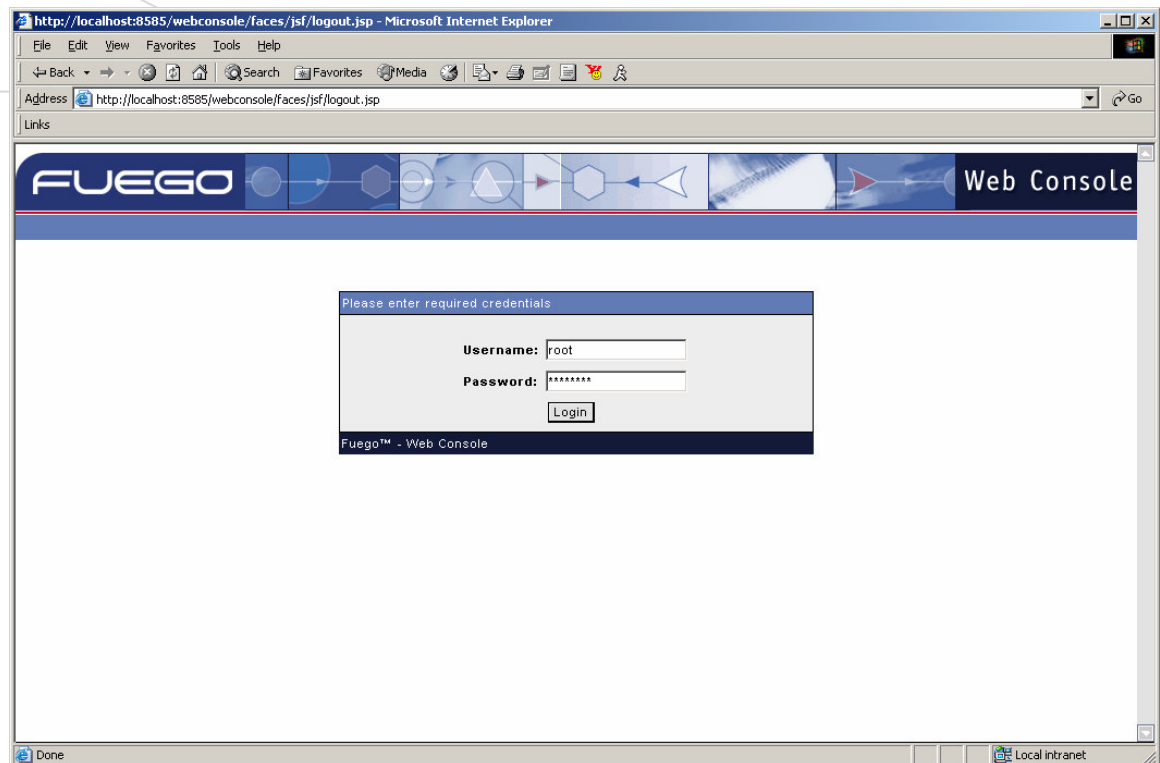




## Configuring a Fuego Engine on JBoss' Application Server

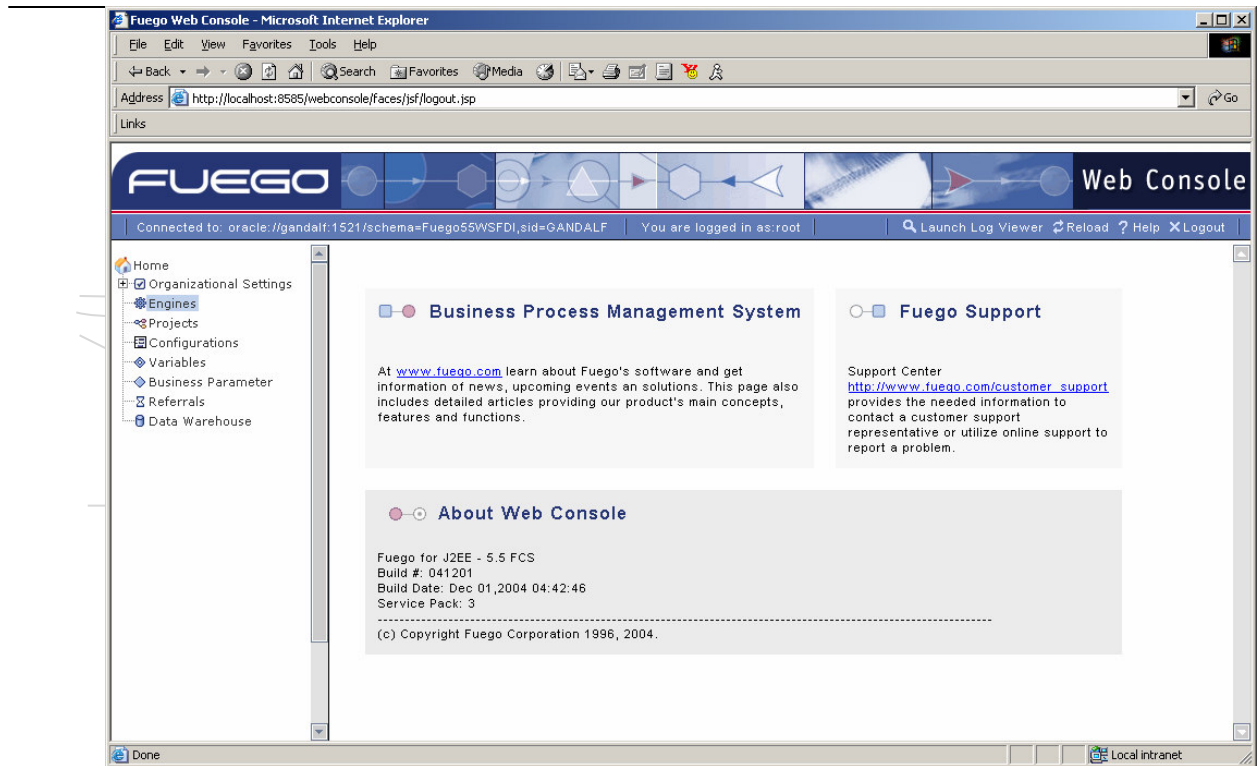
The next step in the setup is to configure the Fuego Engine. This configuration is achieved by using Fuego's Web Console. The previous sections of the document helped on configuring and starting this Web Application.

The Fuego Administrator should use a browser to connect to the Fuego Web Console as illustrated below. The URL <http://host:port/webconsole> should be used where host is the machine where the Web Console Windows Service has been installed and port is the TCP/IP port configured for the Web Console.

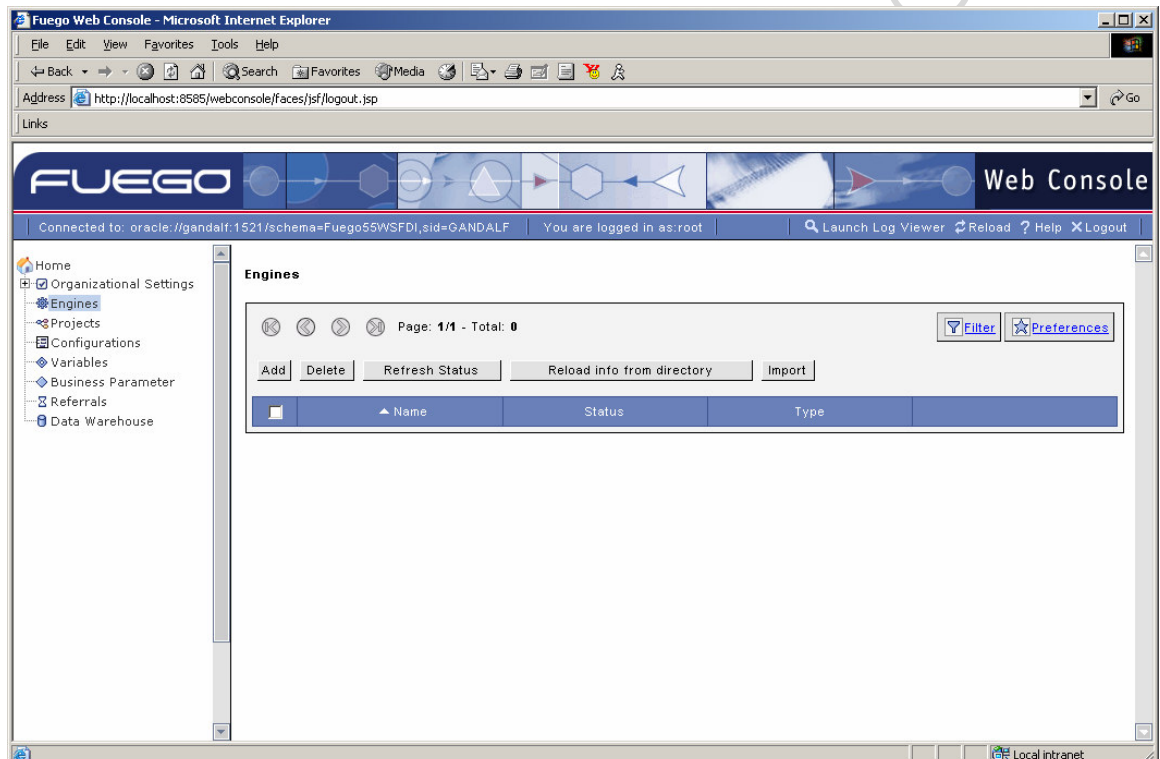


The Administrator user ID provided when creating Fuego's Directory Service should be provided in the "Username" field and its password in the "Password" field to log into Fuego's Web Console. Click on the "Login" button to proceed with the login. The following is the welcome Web Console Panel.

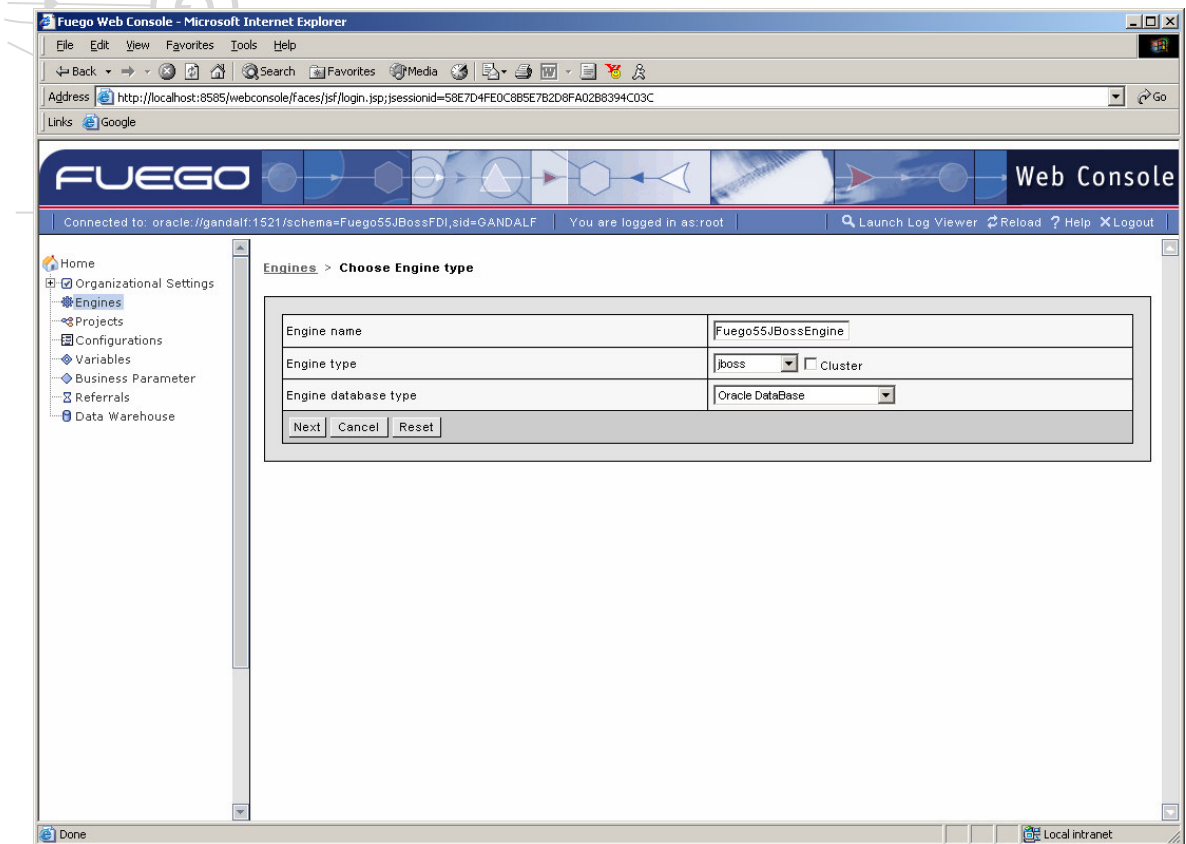




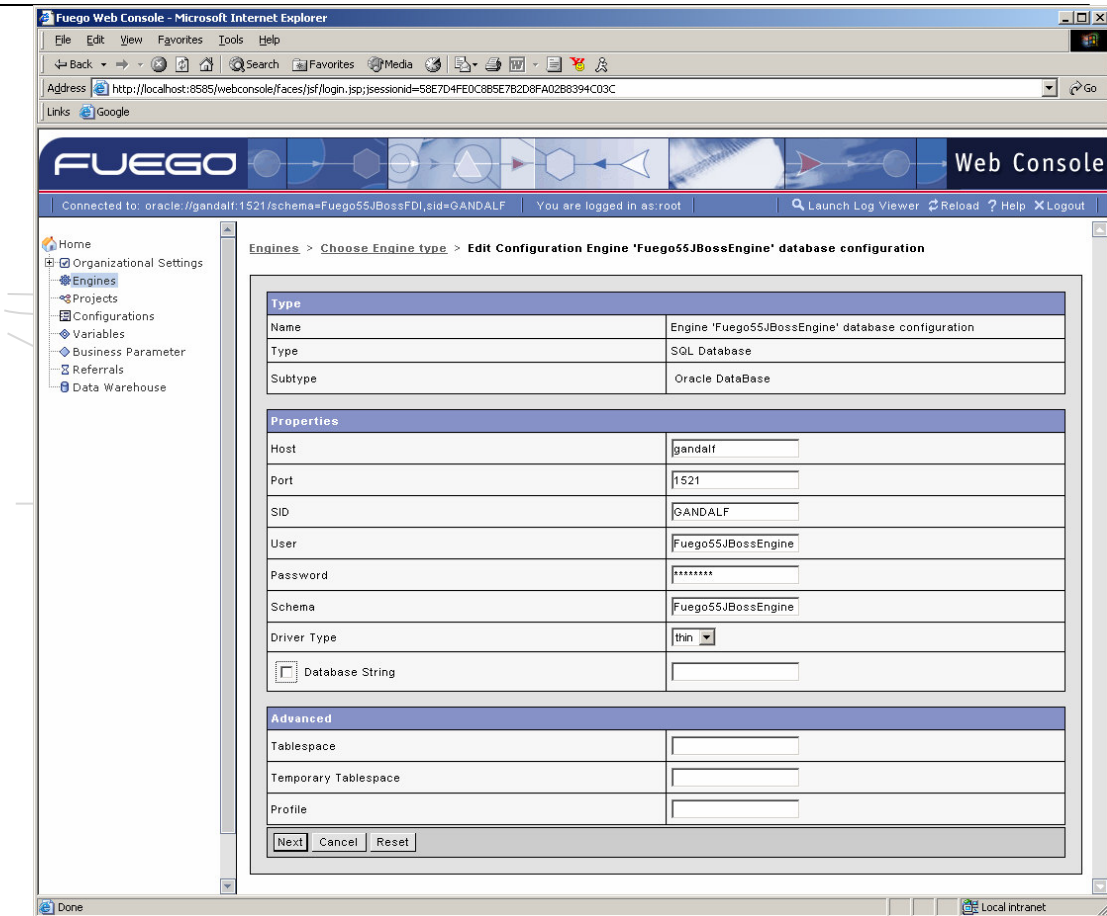
Click on the “Engine” link on the left hand side panel to create a Fuego Engine that will run on JBoss’ Application Server. Click the “Add” button to start creating the Fuego Engine as depicted in the figure below.



After clicking on the “Add” button, a new panel will be presented to select the Engine/Server type to be created. The panel below shows the fields and values selected for our example. In our case, we will define the Fuego Engine to be of “**jboss**” type as well as using Oracle as its target backend RDBMS for business process instance persistence. If the Fuego Engine will be deployed in a clustering environment, the “cluster” checkbox should be selected.



Click “Next” to continue. The panel below requires the Fuego Administrator to provide information for the Fuego Engine backend RDBMS (in our case Oracle Server) that will keep track of every single event taking place for business process instances.



The screenshot shows the Fuego Web Console in Microsoft Internet Explorer. The browser address bar shows the URL: `http://localhost:8585/webconsole/faces/jsf/login.jsp;jsessionid=58E7D4FE0C8B5E7B2D8FA02B8394C03C`. The console header displays the FUEGO logo and "Web Console". Below the header, it indicates the connection: "Connected to: oracle://gandalf:1521/schema=Fuego55JBossFDI,sid=GANDALF" and the user is logged in as "root".

The left sidebar contains a navigation menu with the following items: Home, Organizational Settings, Engines (selected), Projects, Configurations, Variables, Business Parameter, Referrals, and Data Warehouse.

The main content area shows the "Engines > Choose Engine type > Edit Configuration Engine 'Fuego55JBossEngine' database configuration" page. It contains two main sections: "Properties" and "Advanced".

**Properties Section:**

Type	
Name	Engine 'Fuego55JBossEngine' database configuration
Type	SQL Database
Subtype	Oracle DataBase
<b>Properties</b>	
Host	gandalf
Port	1521
SID	GANDALF
User	Fuego55JBossEngine
Password	*****
Schema	Fuego55JBossEngine
Driver Type	thin
<input type="checkbox"/> Database String	

**Advanced Section:**

Tablespace	
Temporary Tablespace	
Profile	

At the bottom of the Advanced section are buttons: Next, Cancel, and Reset.

The following is a list of the panel field with a brief description for each one of them. These fields are specific for Oracle 9i. Different fields may be presented if selecting another Fuego Engine backend RDBMS.

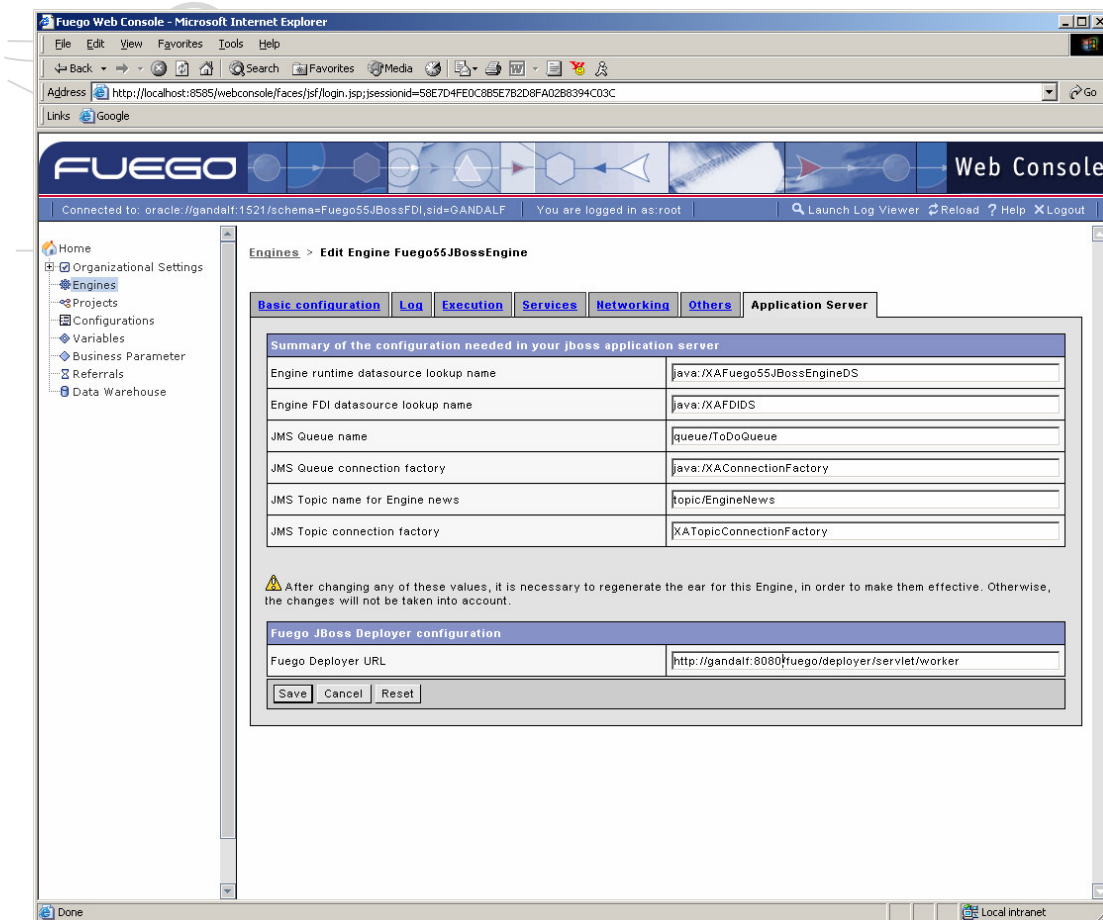
- **Host:** Host where the Oracle 9i is deployed.
- **Port:** TCP/IP port where Oracle's TNS Listener is waiting for incoming connections. For Oracle 9i, this port is usually 1521.
- **SID:** This is the Oracle SID identifying the Oracle Instance where the Fuego Engine User will be deployed.
- **User:** This is the Fuego Engine Oracle User Name. In our case, we named the Oracle User "Fuego55JBossEngine".
- **Password:** This is the password for the User specified in the previous field.
- **Schema:** Fuego's convention is to name the Schema the same as the User name.
- **Driver Type:** You will need to select the Oracle JDBC Driver Type from the drop down. This list for Oracle is composed of thin, oci7, oci8 and oci.

The values in the "Advanced" sub-panel are optional and enable further Database deployment customizations. Click "Next" to proceed with the Fuego Engine creation.

The following panel will show the name for JBoss' resources used internally by the Fuego Engine deployed on JBoss' Application Server. These resources may be modified if JBoss' Administrator already has naming conventions. JBoss' Administrator

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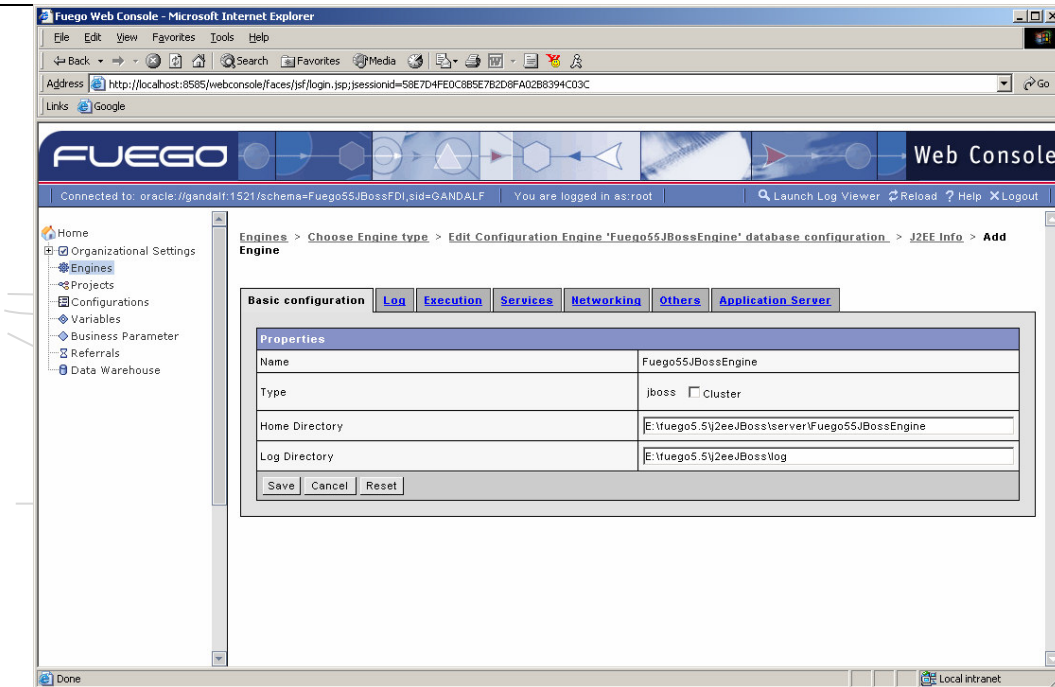
will be in charge of creating these resources after successfully completing the Fuego Engine creation. Instructions on how to create these resources will be provided in the next section of the document. It is important to replace the “<server>” tag in the Fuego Deployer URL Text Field with the name of the host where the JBoss’ Application Server is deployed. The same applies for the “<port>” tag that represents JBoss’ default incoming port. The default for JBoss is 8080.



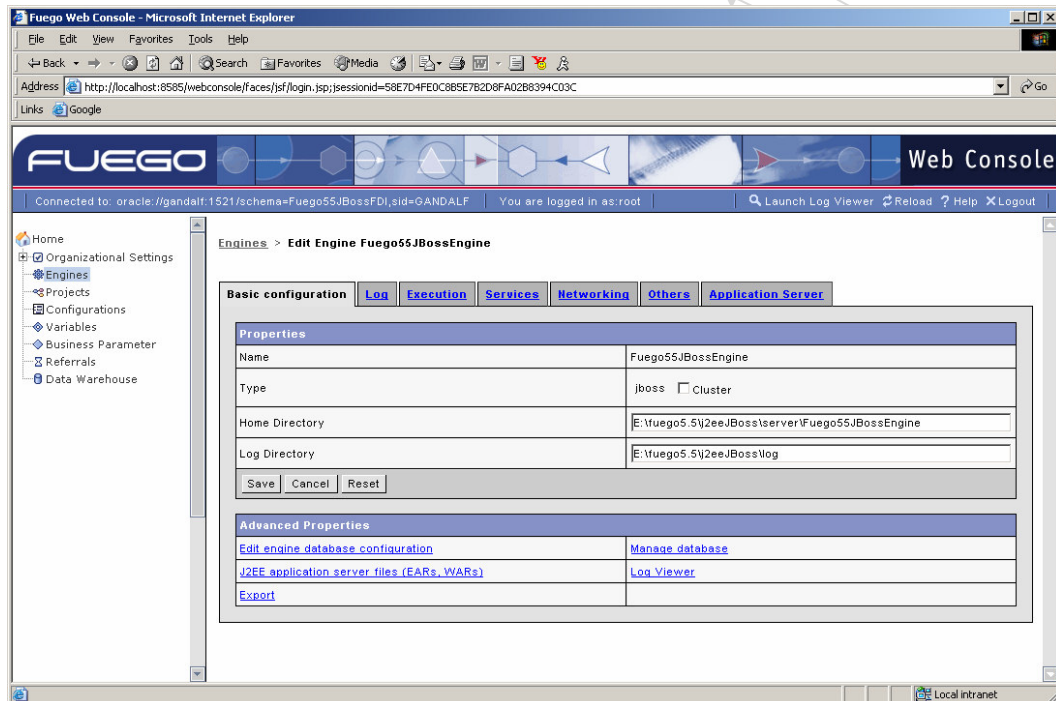
Click “Next” to continue with the Fuego Engine creation.

**IMPORTANT:** If for some reason, the content for the “JMS Topic Connection Factory” entry is set to “XATopicConnectionFactory”, Fuego’s Administrator should change this one to “java:/XAConnectionFactory” which is the default Connection Factory for XA resources.

Next, Fuego’s Administrator should define the basic configuration parameters for the recently created Fuego Engine. The following panel shows the minimal mandatory fields to complete the Fuego Engine creation. It is important to make the Log directories to point to valid and existing paths in the JBoss’ file system host.



Click “Save” to persist the Fuego Engine settings and finish the Fuego Engine creation. The following panel will be displayed after successfully creating the Fuego Engine settings.

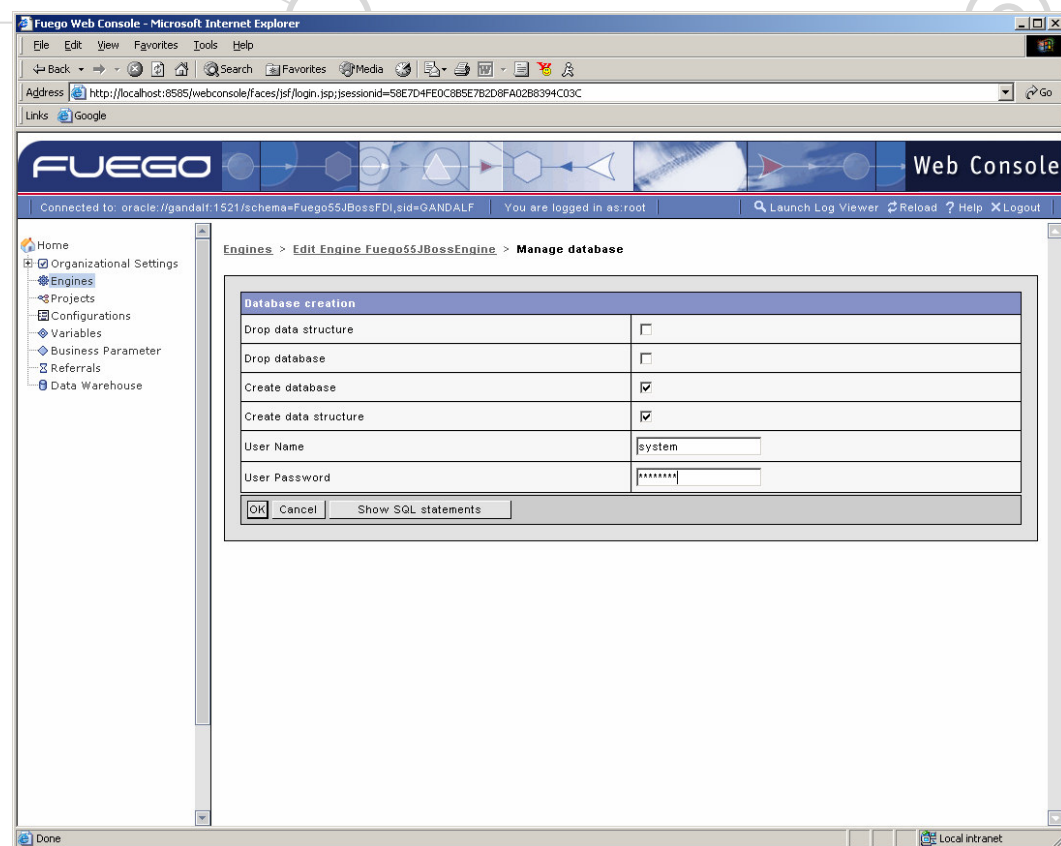


## Creating the Fuego Engine backend RDBMS

After creating the Fuego Engine settings, the Fuego Administrator should proceed to create the backend RDBMS for business process persistence. This is achieved by clicking on the “Manage database” link on the bottom of the panel shown above.

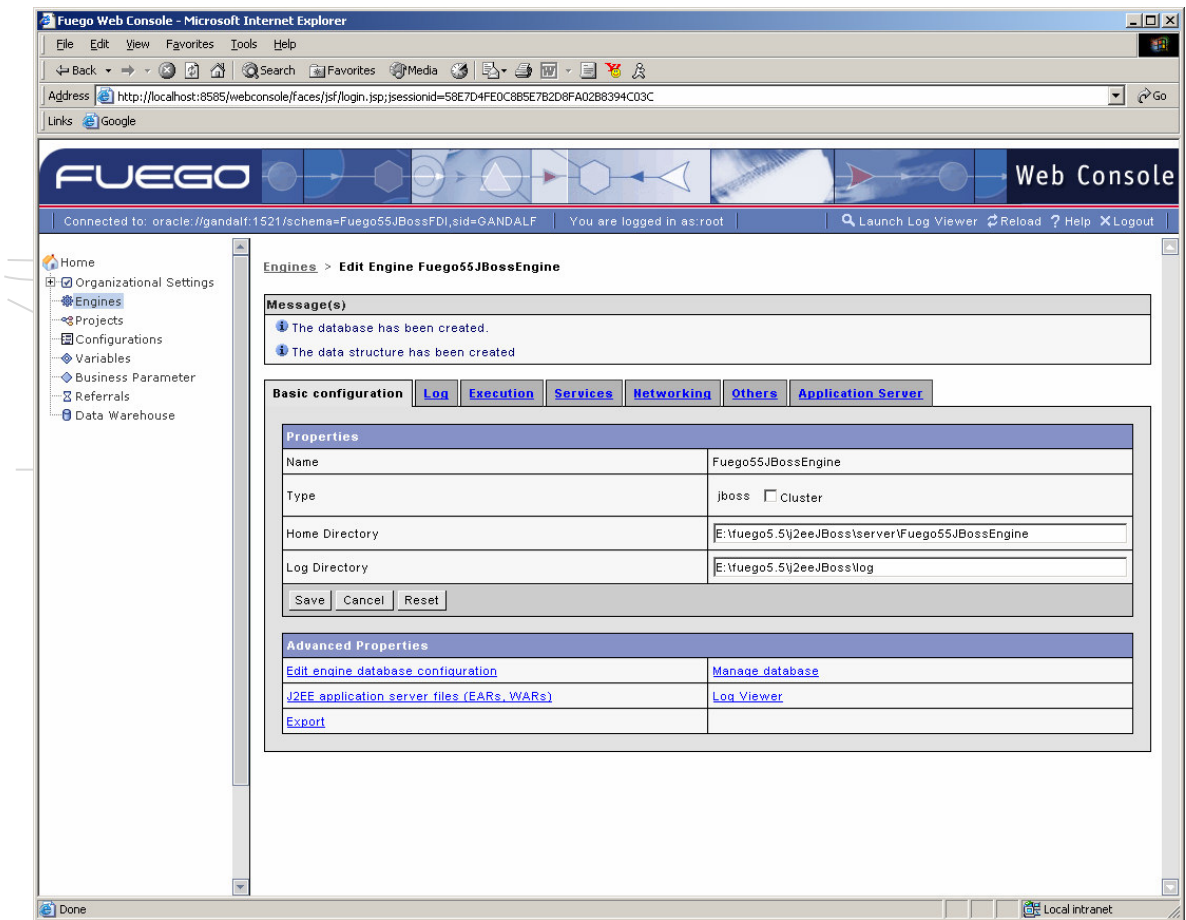
The figure below shows the panel presented to the Fuego Administrator to define the RDBMS creation actions. The checkboxes “create database” and “create data structure” should be selected. Furthermore, an Oracle user and password with enough permission should be provided by the Fuego Administrator for a proper Database creation.

Click “Ok” to proceed with the Fuego Engine creation in the panel shown below.



Upon completion of the triggered action, Fuego’s Administrator should see the notice messages asserting the Database as well as tables successfully created. The figure below shows this such panel.





## ***JBoss' Application Server Configuration***

### **Configuring jboss-service.xml**

JBoss' administration should edit \$JBoss\_HOME/server/default/conf/jboss-service.xml and change the value of the URLComparator attribute in the URLDeploymentScanner mbean. This changes the way in which JBoss loads the deployed applications. We need to change application loading since Fuego EAR's need to be loaded in a particular order for a successful startup.

The modified code should read as follows:

```
<attribute name="URLComparator">
    org.jboss.deployment.scanner.PrefixDeploymentSorter
</attribute>
```

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In the same file, look for the definition of the EARDeployer mbean and make sure the attribute Isolated is set to true. If the line is missing just add it as follows:

```
<mbean
  code="org.jboss.deployment.EARDeployer"
  name="jboss.j2ee:service=EARDeployer">
  <!-- Isolate all ears in their own classloader space -->
  <attribute name="Isolated">true</attribute>
</mbean>
```

## Updating DOM4J Library

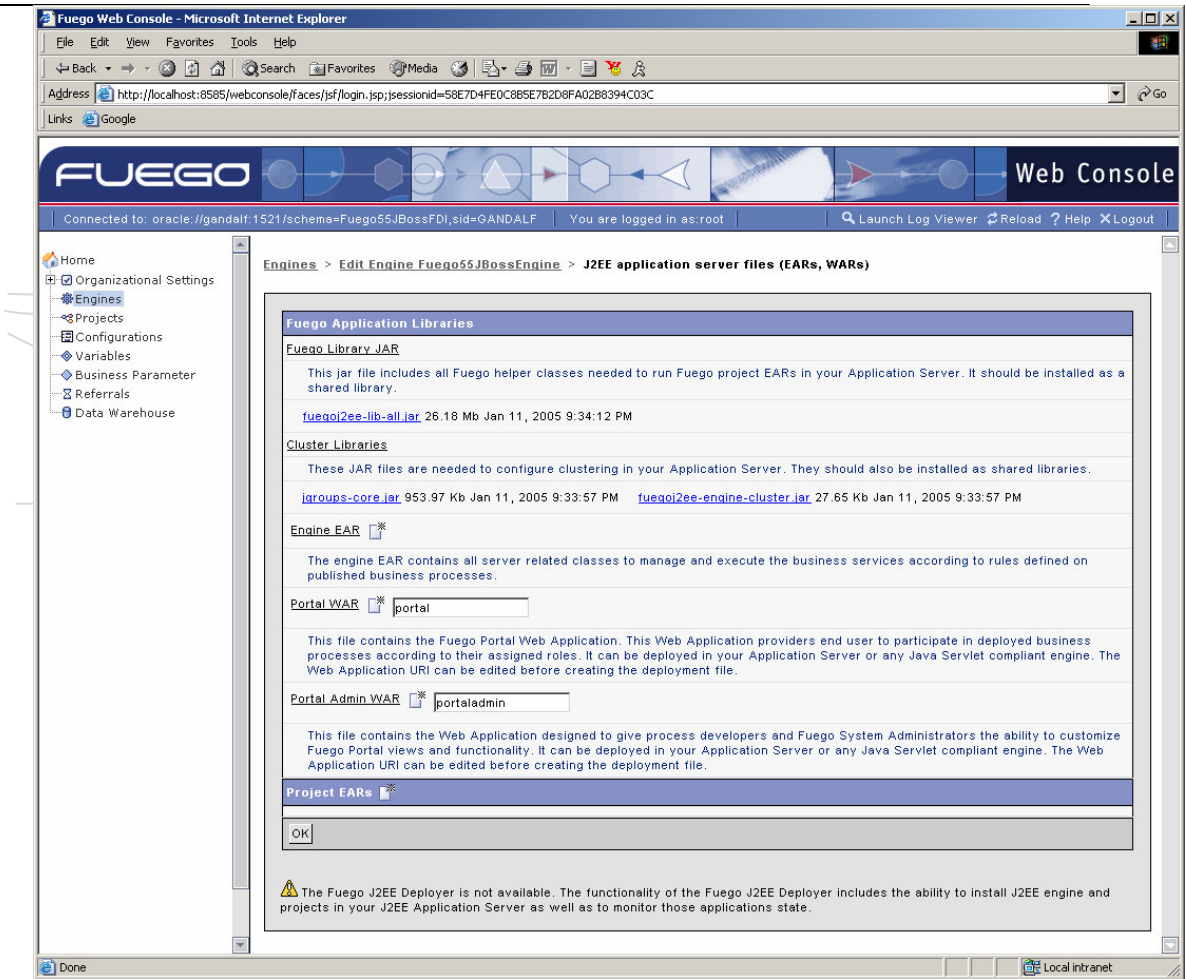
JBoss' administrator must also replace the DOM4J library of your JBOSS server with a newer version. Fuego relies on DOM4J version 1.4. Download the package, unpack the downloaded file and copy the dom4j.jar file to the \$JBoss\_HOME/lib directory. DOM4J is available at <http://www.dom4j.org>.

## Copying Fuego's Runtime libraries into JBoss' Application Server

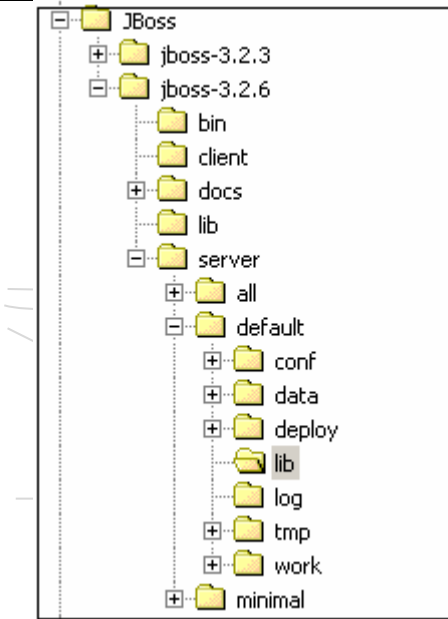
The Fuego J2EE Engine relies on these libraries so they need to be installed before the Fuego J2EE Engine is deployed in JBoss' Application Server. Per JBoss' recommendation, these libraries should be copied in \$JBoss\_HOME/server/default/lib. In this case, we assume you are using JBoss' default server.

Fuego's Administrator can log into Fuego's Web Console and download this JAR file "fuegoj2ee-lib-all.jar". The Navigation path to get to this panel is: Engines -> Engine Name -> J2EE application server files (EARs, WARs).





This file should be given to the JBoss' Administrator and copied in \$JBoss\_HOME/server/default/lib as depicted below.



## Creating Fuego's Directory Service Connection Pool and Data Source

The next step in the configuration is to setup the Directory Service resources into JBoss so that the Fuego Engine can connect successfully to the Oracle Fuego Directory Database.

## Configuring Oracle's JDBC Provider

JBoss's administrator should first copy Oracle's JDBC Driver (e.g.: ojdbc14.jar) into the JBoss' Server lib directory as with the Fuego Runtime libraries.

## Configuring JBoss for successful XA transactions

JBoss' Administrator should edit \$JBASS\_HOME/server/default/conf/jboss-service.xml and uncomment the "Pad" attribute for the Xid Factory MBEAN. The following entry should be present jboss-service.xml configuration file:

```
<mbean code="org.jboss.tm.XidFactory"
      name="jboss:service=XidFactory">
  <attribute name="Pad">true</attribute>
</mbean>
```

## Creating Fuego Engine's DataSource

The Fuego Engine deployed in JBoss needs an XA DataSource for connecting to the Fuego Engine RDBMS. This task is achieved by adding an XML file into the JBoss' deploy directory (e.g.: \$JBOSS\_HOME/server/default/deploy). We will name this file "fuego-xa-ds.xml"

A sample template for this configuration file follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources>
  <xa-datasource>
    <jndi-name>data_source</jndi-name>
    <track-connection-by-tx>true</track-connection-by-tx>
    <isSameRM-override-value>>false</isSameRM-override-value>
    <xa-datasource-class>class</xa-datasource-class>
    <xa-datasource-property
      name="URL">url</xa-datasource-property>
    <xa-datasource-property
      name="User">user</xa-datasource-property>
    <xa-datasource-property
      name="Password">password
    </xa-datasource-property>
    <exception-sorter-class-name>
      org.jboss.resource.adapter.jdbc.vendor.OracleExceptionIo
      nSorter
    </exception-sorter-class-name>
    <no-tx-separate-pools/>
  </xa-datasource>

  <mbean code=
    "org.jboss.resource.adapter.jdbc.xa.oracle.
      OracleXAExceptionFormatter"
    name="jboss.jca:service=OracleXAExceptionFormatter
    ">
    <depends optional-attribute-name=
      "TransactionManagerService">
      jboss:service=TransactionManager</depends>
  </mbean>
</datasources>
```

The following section describes how this datasource XML configuration sample file should be modified for a successful configuration.

**<jndi-name>**: The content of this attribute should be replaced with the name provided to the Fuego Engine DataSource at Fuego Engine creation time. These instructions are naming the Fuego Engine DataSource "XAFuego55JBossEngineDS". JBoss' administrator should avoid the "java:/" prefix.

**<xa-datasource-class>**: The content of this attribute should be replaced with the name of the XA Oracle JDBC Driver that will be used by JBoss to connect to the

Oracle Instance where the Fuego Engine RDBMS is deployed. The default JDBC Driver name for Oracle is: "oracle.jdbc.xa.client.OracleXADataSource".

**<xa-datasource-property name="URL">**: The content of this attribute should be replaced with a valid Oracle JDBC Driver URL. In our case, we are connecting to a standard Oracle 9i installation in a host named "Gandalf" whose ORACLE\_SID is "GANDALF". The resulting JDBC URL should be something like this:

"jdbc:oracle:thin:@gandalf.fuegotech.com:1521:GANDALF"

**<xa-datasource-property name="user">**: The content of this attribute should be the Oracle User name used to connect to the Fuego Engine Database. In our example, this user is: "Fuego55JBossEngine".

**<xa-datasource-property name="password">**: The content of this attribute should be the password for the Fuego Engine Oracle's user specified in the previous field.

The rest of the attributes should stay as outlined in the template.

The following is a sample of how this configuration should be completed.

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources>
<xa-datasource>
  <jndi-name>XAFuego55JBossEngineDS</jndi-name>
  <track-connection-by-tx>true</track-connection-by-tx>
  <isSameRM-override-value>>false
  </isSameRM-override-value>
  <xa-datasource-
class>oracle.jdbc.xa.client.OracleXADataSource</xa-
datasource-class>
  <xa-datasource-property
name="URL">jdbc:oracle:thin:@gandalf.fuegotech.com:152
1:GANDALF</xa-datasource-property>
  <xa-datasource-property
name="User">Fuego55JBossEngine</xa-datasource-
property>
  <xa-datasource-property
name="Password">password</xa-datasource-property>
  <exception-sorter-class-
name>org.jboss.resource.adapter.jdbc.vendor.OracleExce
ptionSorter
  </exception-sorter-class-name>
  <no-tx-separate-pools/>
</xa-datasource>

<mbean code=
"org.jboss.resource.adapter.jdbc.xa.oracle.
OracleXAExceptionFormatter"
```

```

name="jboss.jca:service=OracleXAExceptionFormatter">
  <depends optional-attribute-name=
    "TransactionManagerService">
    jboss:service=TransactionManager</depends>
  </mbean>
</datasources>

```

## Creating Fuego's Directory Service Data Source

A similar procedure as taken for defining the Fuego Engine's Database needs to be taken to define Fuego's Directory Service DataSource. Fuego's Directory Service Database needs to be of XA type. To define FDI's Datasource, JBoss' Administrator should include the following DataSource configuration in the recently created "fuego-xa-ds.xml" file within the JBoss' Application Server deploy directory.

The following is a template for this DataSource configuration file.

```

<xa-datasource>
<jndi-name>data source</jndi-name>
<track-connection-by-tx>true</track-connection-by-tx>
<isSameRM-override-value>>false</isSameRM-override-
value>
<xa-datasource-class>class</xa-datasource-class>
<xa-datasource-property name="URL">
  url</xa-datasource-property>
<xa-datasource-property name="User">
  user</xa-datasource-property>
<xa-datasource-property name="Password">
  password</xa-datasource-property>
<exception-sorter-class-name>
org.jboss.resource.adapter.jdbc.vendor.OracleExceptionS
orter
</exception-sorter-class-name>
<no-tx-separate-pools/>
</xa-datasource>

```

The following section describes how this datasource XML configuration sample file should be modified for a successful configuration.

**<jndi-name>**: The content of this attribute should be replaced with the name provided to the Fuego Engine FDI DataSource at Fuego Engine creation time. These instructions are naming the Fuego Engine DataSource "XAFDIDS". JBoss' administrator should avoid the "java:/" prefix.

**<xa-datasource-class>**: The content of this attribute should be replaced with the name of the XA Oracle JDBC Driver that will be used by JBoss to connect to the Oracle Instance where the Fuego Engine RDBMS is deployed. The default JDBC Driver name for Oracle is: "oracle.jdbc.xa.client.OracleXADataSource".

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**<xa-datasource-property name="URL">**: The content of this attribute should be replaced with a valid Oracle JDBC Driver URL. In our case, we are connecting to a standard Oracle 9i installation in a host named "Gandalf" whose ORACLE\_SID is "GANDALF". The resulting JDBC URL should be something like this:

"jdbc:oracle:thin:@gandalf.fuegotech.com:1521:GANDALF"

**<xa-datasource-property name="user">**: The content of this attribute should be the Oracle User name used to connect to the Fuego Directory Service Database. In our example, this user is: "Fuego55JBossFDI".

**<xa-datasource-property name="password">**: The content of this attribute should be the password for the Fuego Engine Oracle's user specified in the previous field.

The rest of the attributes should stay as outlined in the template.

The following is a sample of how this configuration should be completed.

```
<xa-datasource>
<jndi-name>XAFDIDS</jndi-name>
<track-connection-by-tx>true</track-connection-by-tx>
<isSameRM-override-value>>false</isSameRM-override-
value>
<xa-datasource-
class>oracle.jdbc.xa.client.OracleXADataSource</xa-
datasource-class>
<xa-datasource-property
name="URL">jdbc:oracle:thin:@gandalf.fuegotech.com:152
1:GANDALF</xa-datasource-property>
<xa-datasource-property
name="User">Fuego55JBossFDI</xa-datasource-property>
<xa-datasource-property name="Password">password</xa-
datasource-property>
<exception-sorter-class-
name>org.jboss.resource.adapter.jdbc.vendor.OracleExce
ptionSorter</exception-sorter-class-name>
<no-tx-separate-pools/>
</xa-datasource>
```

The whole configuration file should look like this:

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources>
  <xa-datasource>
    <jndi-name>XAFuego55JBossEngineDS</jndi-name>
    <track-connection-by-tx/>
    <isSameRM-override-value>>false</isSameRM-override-
value>
```

```

    <xa-datasource-
class>oracle.jdbc.xa.client.OracleXADataSource</xa-
datasource-class>
    <xa-datasource-property
name="URL">jdbc:oracle:thin:@gandalf:1521:GANDALF</xa-
datasource-property>
    <xa-datasource-property
name="User">Fuego55JBossEngine</xa-datasource-
property>
    <xa-datasource-property
name="Password">password</xa-datasource-property>
    <exception-sorter-class-
name>org.jboss.resource.adapter.jdbc.vendor.OracleExce
ptionSorter</exception-sorter-class-name>
    <no-tx-separate-pools/>
</xa-datasource>

<xa-datasource>
    <jndi-name>XAFDIDS</jndi-name>
    <track-connection-by-tx/>
    <isSameRM-override-value>>false</isSameRM-override-
value>
    <xa-datasource-
class>oracle.jdbc.xa.client.OracleXADataSource</xa-
datasource-class>
    <xa-datasource-property
name="URL">jdbc:oracle:thin:@gandalf:1521:GANDALF</xa-
datasource-property>
    <xa-datasource-property
name="User">Fuego55JBossFDI</xa-datasource-property>
    <xa-datasource-property
name="Password">password</xa-datasource-property>
    <exception-sorter-class-
name>org.jboss.resource.adapter.jdbc.vendor.OracleExce
ptionSorter</exception-sorter-class-name>
    <no-tx-separate-pools/>
</xa-datasource>

<mbean
code="org.jboss.resource.adapter.jdbc.xa.oracle.Oracle
XAExceptionFormatter"

name="jboss.jca:service=OracleXAExceptionFormatter">
    <depends optional-attribute-
name="TransactionManagerService">jboss:service=Transac
tionManager</depends>

```



```

</mbean>

</datasources>

```

## Creating Queues and Topics for Fuego Engine for Automatic Activity execution and News

### Creating a Queue for Fuego's ToDoItems Queue

JBoss's Administrator should proceed to create a JMS Queue to successfully manage Fuego Engine ToDoItems (execution of automatic steps defined in Fuego Business Processes). In order to create a Queue, JBoss' Administrator should edit the file called \$JBoss\_HOME/server/default/deploy/jms/jbossmq-destinations-service.xml. Within this file, JBoss' Administrator should add the following MBEAN entry to define the Queue for Fuego's ToDoItem execution.

```

<mbean
  code="org.jboss.mq.server.jmx.Queue"
  name="jboss.mq.destination:service=Queue,name=ToDoQueue">
  <depends optional-attribute-
name="DestinationManager">
    jboss.mq:service=DestinationManager
  </depends>
</mbean>

```

You will need to make sure the name given to the Queue matches the one in the definition of the Fuego Engine J2EE resources. For these instructions, the Queue name is: "ToDoQueue" as shown in the XML attribute above. It is important not to include the "queue/" prefix.

### Creating a Topic for Fuego Engine's News Topic

JBoss's Administrator should proceed to create a JMS Topic to successfully manage Fuego Engine ToDoItems (execution of automatic steps defined in Fuego Business Processes). In order to create a Topic, JBoss' Administrator should edit the file called \$JBoss\_HOME/server/default/deploy/jms/jbossmq-destinations-service.xml. Within this file, JBoss' Administrator should add the following MBEAN entry to define the Topic for Fuego's News distribution and broadcasting.



```
<mbean
  code="org.jboss.mq.server.jmx.Topic"
  name="jboss.mq.destination:service=Topic,name=EngineNews">
  <depends optional-attribute-
name="DestinationManager">
    jboss.mq:service=DestinationManager
  </depends>
</mbean>
```

You will need to make sure the name given to the Topic matches the one in the definition of the Fuego Engine J2EE resources. For these instructions, the Topic name is: “EngineNews” as shown in the XML attribute above. It is important not to include the “topic/” prefix.

After configuring these resources and JBoss’ Application Server is started, JBoss’ Administrator should see the following entries in JBoss’ Console.

```
...
15:34:16,908 INFO [EngineNews] Bound to JNDI name: topic/EngineNews
15:34:16,918 INFO [ToDoQueue] Bound to JNDI name: queue/ToDoQueue
...
16:34:43,793 INFO [Server] JBoss (MX MicroKernel) [3.2.6 (build: CVSTag=JBoss_3_2_6 date=200410140106)]
Started in 15s:553ms
```

## ***Deploying Fuego J2EE Deployer, Fuego Engine and Fuego Work Portal on JBoss***

Now that the J2EE resources have been created in JBoss’ Application Server, Fuego’s Administrator should provide the EAR (Enterprise Application Files) files to the JBoss’ Administrator for deployment.

### **Requirements before deploying Fuego J2EE Application**

add the following property: “java.awt.headless” with a value set to true. The following panel depicts this setting.

### **Fuego J2EE Deployer for JBoss**

The Fuego Enterprise for JBoss does not bundle the Fuego J2EE deployer since the deployment in JBoss is extremely easy. The Fuego J2EE Applications just need to be

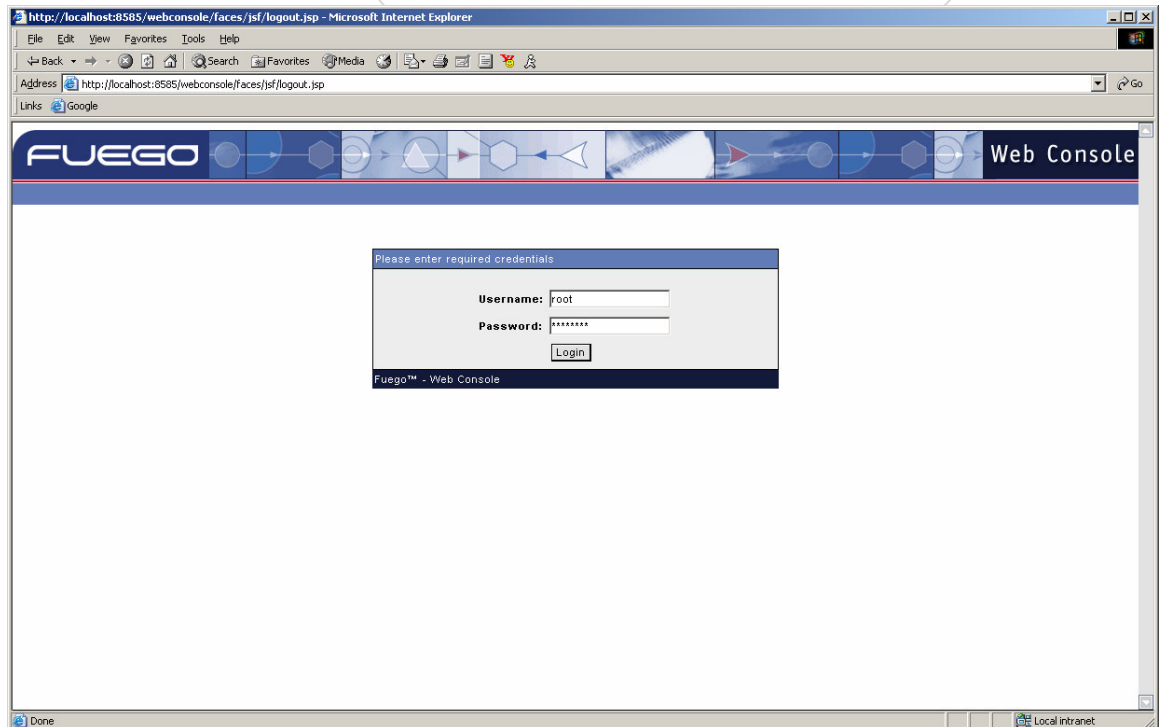
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copied into the JBoss' Application Server deploy directory and this is the reason for which this application is not in the JBoss installer bundle.

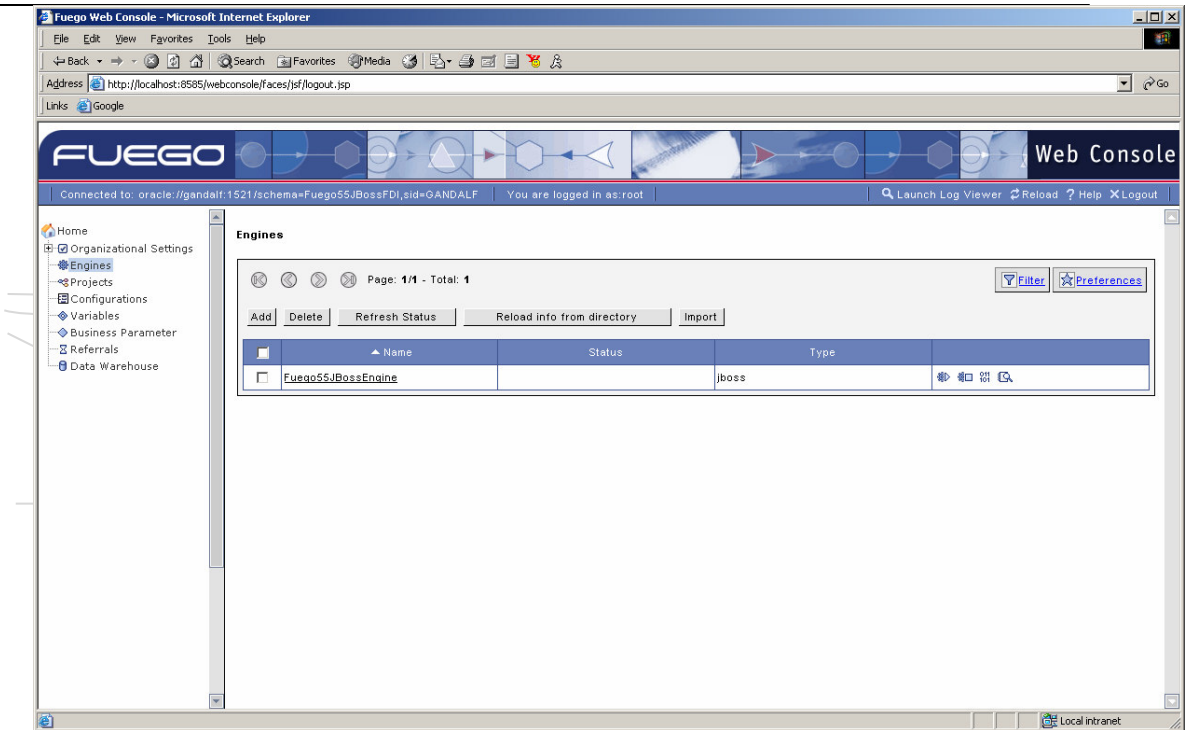
## Deploying Fuego J2EE Engine

Now it is time to deploy the Fuego Enterprise Engine for JBoss into the JBoss Application Server. For this purpose, Fuego's Administrator will need to log into Fuego's Web Console to create the Fuego Engine for JBoss EAR and hand it over to the JBoss Administrator for subsequent deployment.

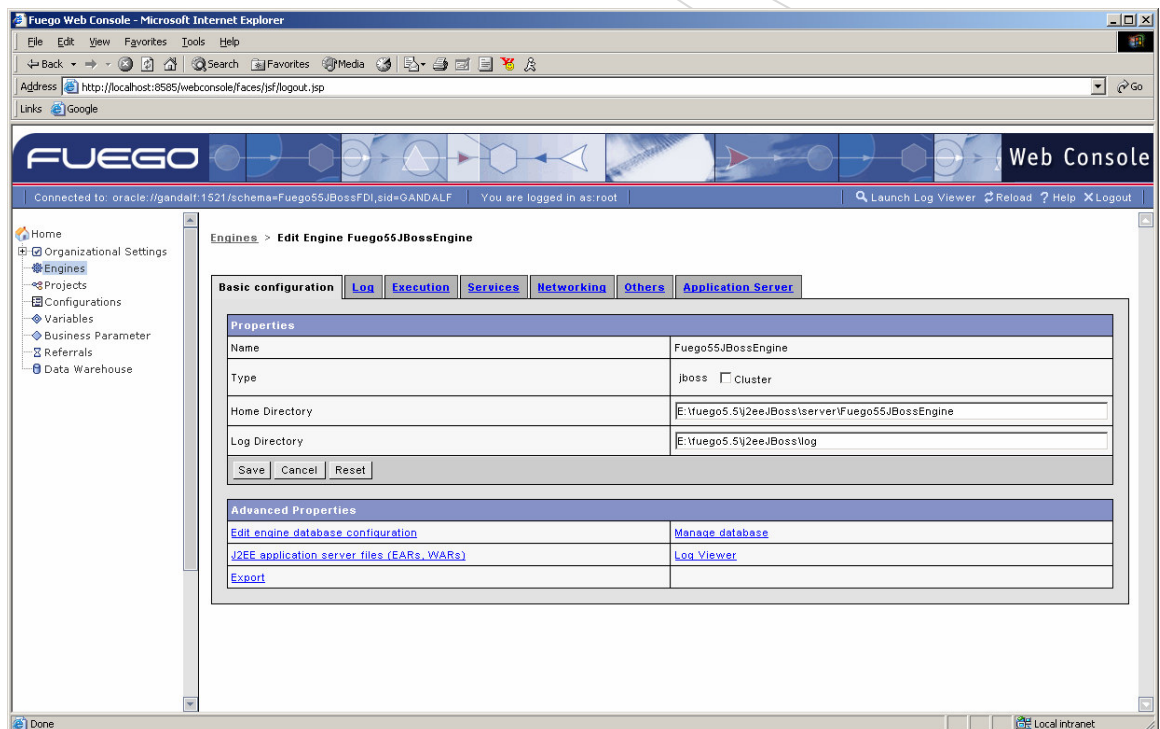
To proceed with the deployment of the Fuego J2EE Engine, Fuego's Administrator will need to first launch Fuego's Web Console.



After logging into Fuego's Web Console, click on the "Engine" node on the left navigational tree. This will take you to the Fuego Engine Definition as shown below.

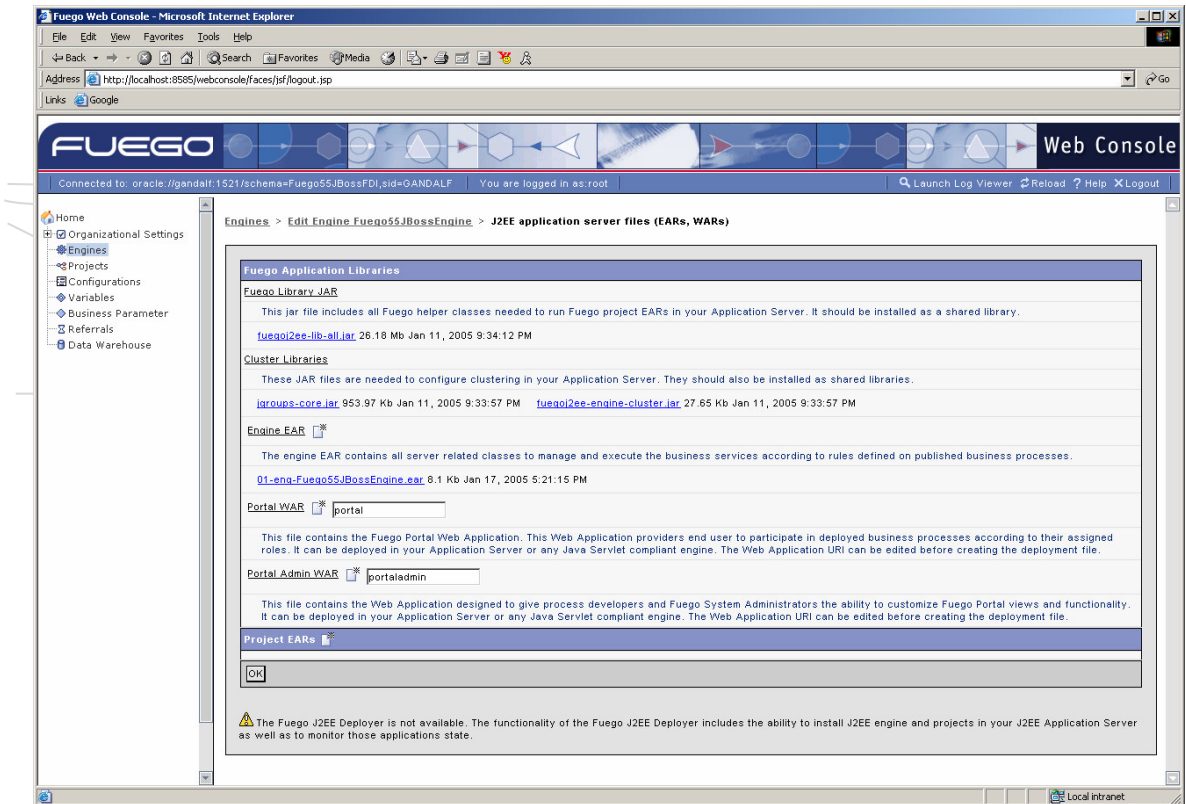


Click on the Engine name to proceed.



Fuego’s Administrator should click on the “J2EE Application Server files (EARS, WARs)”. This will take Fuego’s Administrator to the Panel where the Fuego J2EE

Applications can be assembled to be given to the JBoss' Administrator for deployment. The following panel depicts all the Fuego J2EE Applications that can be deployed.



Fuego's Administrator should now click on the icon next to the "Engine EAR". This will trigger the creation of the Fuego Engine EAR file targeted for a JBoss Application Server. After clicking on this icon, you should see a link down the EAR description as shown in the figure above. Fuego's Administrator should download this EAR and give it to JBoss' Administrator for deployment.

JBoss' Administrator in turn should copy this Fuego Engine EAR file into the JBoss' Application Server deploy directory (e.g.: \$JBoss\_HOME/server/default/deploy).

After successful Engine deployment, the content of JBoss' console should include entries similar to the ones outlined below:

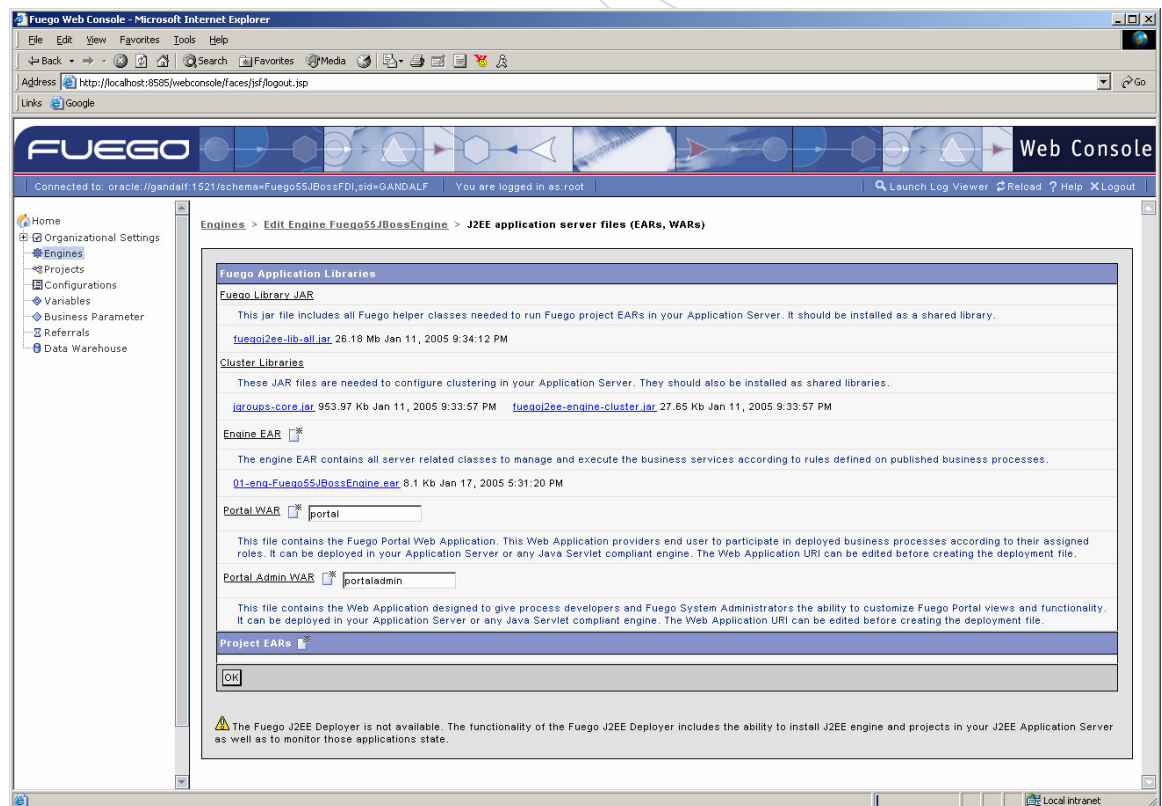
```
...
17:35:47,030 INFO [Engine] StandardContext[/web-console]jsp: init
17:35:47,131 INFO [EARDeployer] Init J2EE application: file:/E:/Downloads/JBoss/jboss-3.2.6/server/default/deploy/01-eng-Fuego55JBossEngine.ear
17:35:47,591 INFO [EjbModule] Deploying engine-Fuego55JBossEngine
17:35:47,741 INFO [EjbModule] Deploying engine-startup-Fuego55JBossEngine
17:35:47,761 INFO [EjbModule] Deploying engine-admin-Fuego55JBossEngine
17:35:47,772 INFO [EjbModule] Deploying item-execution-Fuego55JBossEngine
17:35:48,232 INFO [EJBDeployer] Deployed: file:/E:/Downloads/JBoss/jboss-3.2.6/server/default/tmp/deploy/tmp3960701-eng-Fuego55JBossEngine.ear-contents/engine-Fuego55JBossEngine.jar
17:35:48,342 INFO [TomcatDeployer] deploy, ctxPath=/fuegoServices, warUrl=file:/E:/Downloads/JBoss/jboss-3.2.6/server/default/tmp/deploy/tmp3960701-eng-Fuego55JBossEngine.ear-contents/engine-startup-Fuego55JBossEngine.war/
```

```

17:35:48,483 INFO [Engine] StandardContext[/fuegoServices]engineStartup: init
17:35:49,103 INFO [STDOUT] The JRE version is supported. However, take into account the following tested versions:
* Vendor Sun Microsystems Inc. - Version 1.4.2
* Vendor Sun Microsystems Inc. - Version 1.4.2
17:35:50,085 INFO [STDOUT] Could not find configuration file [E:\Downloads\JBoss\jboss-
3.2.6\server\default\conf\directory.properties]. No properties were loaded.
17:35:52,689 INFO [STDOUT] engineId = Fuego55JBossEngine
17:35:55,362 INFO [Engine] StandardContext[/fuegoServices]default: init
17:35:55,372 INFO [Engine] StandardContext[/fuegoServices]soapService: init
17:35:56,204 INFO [Engine] StandardContext[/fuegoServices]b2bService: init
17:35:56,214 INFO [Engine] StandardContext[/fuegoServices]jsp: init
17:35:56,294 INFO [EARDeployer] Started J2EE application: file:/E:/Downloads/JBoss/jboss-
3.2.6/server/default/deploy/01-eng-Fuego55JBossEngine.ear
17:35:56,684 INFO [Http11Protocol] Starting Coyote HTTP/1.1 on http-0.0.0.0-8080
17:35:56,925 INFO [ChannelSocket] Port busy 8009 java.net.BindException: Address already in use: JVM_Bind
17:35:56,935 INFO [ChannelSocket] JK2: ajp13 listening on /0.0.0.0:8010
17:35:56,965 INFO [JkMain] Jk running ID=1 time=0/140 config=null
17:35:56,985 INFO [Server] JBoss (MX MicroKernel) [3.2.6 (build: CVSTag=JBoss_3_2_6 date=200410140106)]
Started in 25s:807ms
  
```

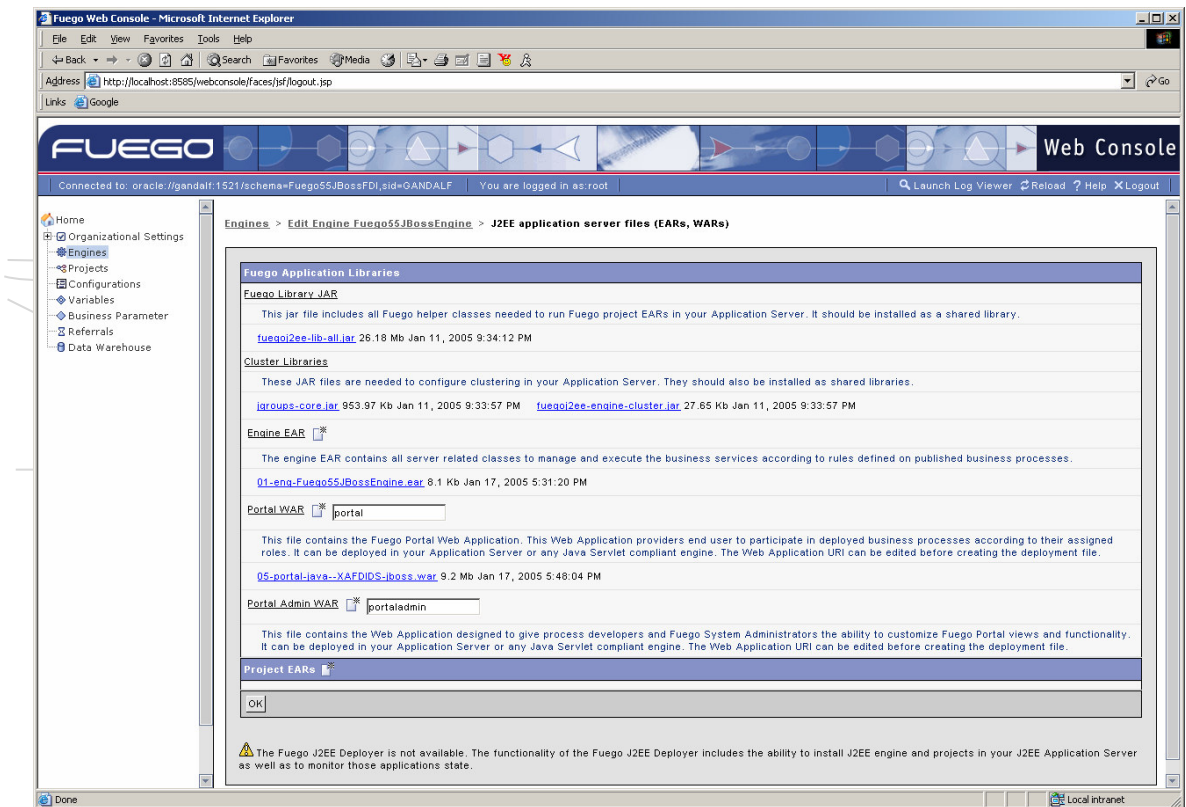
## Deploying Fuego Work Portal

Similar actions should be taken by both the Fuego and JBoss' Administrators to deploy the Fuego Work Portal into JBoss. Fuego's Administrator should click on the icon next to the "Portal WAR" entry as shown below.



After successful Work Portal WAR creation, a link should be available down below the Work Portal description as shown in the figure below.

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Fuego's Administrator should provide the file linked to the hyperlink in Fuego's Web Console. JBoss' Administrator should copy the file into JBoss' Application Server deploy directory.

After successful deployment of the EAR, entries similar to the ones shown below should be seen in JBoss' Console.

```
...
17:50:18,073 INFO [TomcatDeployer] deploy, ctxPath=/portal, warUrl=file:/E:/Downloads/JBoss/jboss-
3.2.6/server/default/tmp/deploy/tmp3960805-portal-java--XAFDIDS-jboss.war/
17:50:18,884 INFO [STDOUT] Thread[ScannerThread,5,jboss]: CompressionFilter: Using debug = (0)
17:50:18,904 INFO [Engine] StandardContext[/portal]startup: init
17:50:18,904 INFO [STDOUT] ***** Web Work Portal (Version 5.5 GA Service Pack 0) is starting *****
17:50:18,904 INFO [STDOUT] Checking Java Runtime Enviroment ...
17:50:18,904 INFO [STDOUT] Ok
17:50:18,904 INFO [STDOUT] Initializing enviroment...
17:50:18,954 INFO [STDOUT] Ok
17:50:18,954 INFO [STDOUT] Loading Plugins ...
17:50:18,954 INFO [STDOUT] Ok
17:50:18,964 INFO [STDOUT] Checking attachments configuration ...
17:50:18,964 INFO [STDOUT] Ok
17:50:18,964 INFO [STDOUT] Initializing PAPI services ...
17:50:19,755 INFO [STDOUT] Ok
17:50:19,765 INFO [STDOUT] Initializing XObjects ...
17:50:19,765 INFO [STDOUT] Ok
17:50:19,765 INFO [STDOUT] ***** Web Work Portal was initialized successfully *****
17:50:19,765 INFO [Engine] StandardContext[/portal]default: init
17:50:19,765 INFO [Engine] StandardContext[/portal]jsp: init
17:50:24,252 INFO [Engine] StandardContext[/portal]imagePipe: init
...
```



## Troubleshooting

The following section will outline some of the most common configuration errors found in JBoss' console log as well as the needed actions to correct them.

- 1) Exception: java.lang.ClassNotFoundException: No ClassLoaders found for: oracle.jdbc.xa.OracleXAException.

Answer: The Oracle JDBC JAR file containing the XA Classes is not in JBoss' Application Server lib directory. The appropriate jar needs to be copied into \$JBOSS\_HOME/server/default/lib.

- 2) Exception: java.lang.NoClassDefFoundError: fuego/papi/OperationException

Answer: The Fuego Runtime JAR file is not present in JBoss' Application Server lib directory to properly start Fuego's Work Portal. Fuego's jar fuegoj2ee-lib-all.jar needs to be copied into \$JBOSS\_HOME/server/default/lib.

- 3) Exception: java.lang.NoClassDefFoundError: fuego/server/execution/ImmediateItem

Answer: The Fuego Runtime JAR file is not present in JBoss' Application Server lib directory to properly start Fuego's Engine. Fuego's jar fuegoj2ee-lib-all.jar needs to be copied into \$JBOSS\_HOME/server/default/lib.

- 4) Exception: [TransactionImpl] xa error: -4 (The XID is not valid.); oracle error: 24756; oracle sql error: 0; oracle.jdbc.xa.OracleXAException

Answer: JBoss' needs to have a special padding to successfully execute XA transactions when Oracle is one of the DataSources. To correct this problem, the "Pad" attribute needs to be enabled and assigned the value true for the org.jboss.tm.XidFactory MBEAN. This MBEAN can be found in jboss-service.xml in \$JBOSS\_HOME/server/default/conf directory.

- 5) Exception: [URLDeploymentScanner] Incomplete Deployment listing:  
 Packages waiting for a deployer: org.jboss.deployment.DeploymentInfo@a8bb9d34 {  
 url=file:/E:/Downloads/JBoss/jboss-3.2.6/server/default/deploy/fuego-xa-ds.xml }  
 deployer: null  
 status: null  
 state: INIT\_WAITING\_DEPLOYER  
 watch: file:/E:/Downloads/JBoss/jboss-3.2.6/server/default/deploy/fuego-xa.ds.xml  
 lastDeployed: 1105999489002  
 lastModified: 1105999488992  
 mbeans:

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Answer: There is a problem with the content in the fuego-xa-ds.xml where the Fuego DataSources have been defined. JBoss' Administrator should look for tags not properly closed or misspells into the XML file.

