

# Deployment

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## 1. Introduction

This section enumerates all things needed to deploy OJB in standalone or servlet based applications and j2ee-container.

## 2. Things needed for deploying OJB

### 2.1. 1. The OJB binary jar archive

You need a `db-ojb-<version>.jar` file containing the compiled OJB library. This jar files contains all OJB code necessary in production level environments. It does not contain any test code. It also does not contain any configuration data. You'll find this file in the `lib` directory of the binary distribution. If you are working with the source distribution you can assemble the binary jar archive By calling

```
ant jar
```

This ant task generates the binary jar to the `dist` directory.

### 2.2. 2. Configuration data

OJB needs two kinds of configuration data:

1. Configuration of the OJB runtime environment. This data is stored in a file named [OJB.properties](#). [Learn more about this file here](#).
2. Configuration of the MetaData layer. This data is stored in file named [repository.xml](#) (and several included files). [Learn more about this file here](#).

#### Note:

These configuration files are read in through ClassLoader resource lookup and must therefore be placed on the classpath.

### 2.3. 3. External dependencies that do not come with OJB

Some components of OJB depend on external libraries and components that cannot be shipped with OJB. You'll also need these if you want to compile OJB from source. Here is a list of these dependencies:

**j2ee.jar**

This is the main archive of the [J2EE SDK](#).

**jdo.jar, jdori\*.jar**

The [JDO Reference implementation](#) is required if you plan to use the JDO Api.

### 2.4. 4. Optional jar archives that come with OJB

Some of jar files in the `lib` folder are only used during build-time or are only required by certain components of OJB, and so they might need not to be needed in runtime environments.

Apart from wasting disk space they do no harm. If you don't care about disk space you just take all jars from the `lib` folder.

If you do care, here is the list of jars you might omit during runtime:

**ant-\*.jar**

These are the [Apache Ant 1.6](#) jars.

**antlr-[version].jar**

[ANTLR](#) is a parser generator which is used in the ODMG component of OJB. If you only use the PB Api, then you don't need this.

`junit.jar`

[JUnit](#) for running the unit tests. You'll need this only if you're also writing unit tests for you app.

`xerces.jar`, `xml-apis.jar`

The [Xerces](#) XML parser. Since most newer JDK's ship with an XML parser, it is likely that you do not need these files.

`xalan.jar`

[Xalan](#) is used to generate the unit test report, so you'll probably don't need this.

`jakarta-regexp-[version].jar`

The [Jakarta Regular Expression library](#) is only used when building OJB from source.

`torque-xxx.jar`, `velocity-xxx.jar`

[Torque](#) is used to generate concrete databases from database-independent schema files. OJB uses it internally to setup databases for the unit tests.

`xdoclet-[version].jar`, `xjavadoc-[version].jar`,

`xdoclet-ojb-module-[version].jar`,

`commons-collections-[version].jar`

The [XDoclet OJB module](#) can be used to generate the repository metadata and Torque schema files from Javadoc comments in the Java source files. It is however not required at runtime, so you can safely ignore these files then.

### 2.5.5. Don't forget the JDBC driver

The `repository.xml` defines JDBC Connections to your runtime databases. To use the declared JDBC drivers the respective jar archives must also be present in the classpath. Refer to the documentation of your databases.

In the following sections I will describe how to deploy these items for specific runtime environments.

## 3. Deployment in standalone applications

Deploying OJB for standalone applications is most simple. If you follow these four steps your application will be up in a few minutes.

1. Add `db-ojb-<version>.jar` to the classpath
2. place `OJB.properties` and `repository.xml` files on the classpath
3. Add the additional runtime jar archives to the classpath.
4. Add your JDBC drivers jar archive to the classpath.

## 4. Deployment in servlet based applications

Generally speaking the four steps described in the previous section have to be followed also in Servlet / JSP based environments.

The exact details may differ for your specific Servlet container, but the general concepts should be quite similar.

1. Deploy `db-ojb-<version>.jar` with your servlet applications WAR file.  
The WAR format specifies that application specific jars are to be placed in a directory `WEB-INF/lib`. Place `db-ojb-<version>.jar` to this directory.
2. Deploy [OJB.properties](#) and [repository.xml](#) with your servlet applications WAR file.  
The WAR format specifies that Servlet classes are to be placed in a directory `WEB-INF/classes`. The OJB configuration files have to be in this directory.
3. Add the additional runtime jar archives to `WEB-INF/lib` too.
4. Add your JDBC drivers jar archive to `WEB-INF/lib`.

By executing `ant war` you can generate a sample servlet application assembled to a valid WAR

file. The resulting `obj-servlet.war` file is written to the `dist` directory. You can deploy this WAR file to your servlet engine or unzip it to have a look at its directory structure. you can also use the target war as a starting point for your own deployment scripts.

## 5. Deployment in managed environment (e.g. EJB based)

The above mentioned guidelines concerning jar files and placing of the *OJB.properties* and the *repository.xml* are valid for managed/EJB environments as well.

But apart from these basic steps you'll have to perform some additional configurations to integrate OJB into a managed environment.

*Managed environment: Using of OJB in a managed environment means primarily the cooperation of OJB with the application server JTA service (via JCA or by using JTA classes).*

The instructions to make OJB running within your application server should be similar for all server. So the following instructions for JBoss should be useful for all user. E.g. most [OJB.properties](#) file settings are the same for all application server.

There are some topics you should examine very carefully:

- **Connection handling:** Lookup DataSource from your AppServer, only these connections can be enlisted in running transactions (JTA)
- **Caching:** Do you need caching? Do you need distributed caching?
- **Locking:** Do you need distributed locking (when using odmng-api in clustered environments)?

### 5.1. Configure OJB for managed environments considering as JBoss example

The following steps describe how to configure OJB for managed environments and deploy on a ejb conform Application Server on the basis of the [shipped ejb-examples](#). In managed environments OJB needs some specific properties:

#### 5.1.1. 1. Adapt OJB.properties file

If the PB-api is the only persistence API being used (no ODMG nor JDO) and it is **only** being used in a managed environment, it is strongly recommended to use a special `PersistenceBrokerFactory` class, which enables `PersistenceBroker` instances to participate in the running JTA transaction - e.g. this makes `PBStateListener` proper work in managed environments and enables OJB to synchronize the persistent [caches](#) (e.g. the two-level cache):

```
PersistenceBrokerFactoryClass=org.apache.obj.broker.core.PersistenceBrokerFactorySyncImpl
```

#### Note:

Don't use this setting in conjunction with any other top-level api (e.g. ODMG-api).  
If **no permanent caching** (only the "empty" cache implementation or the "per broker cache") is used and the `PBStateListener` is not used to detect tx demarcation, it's possible to use the default `PersistenceBrokerFactory` implementation, because OJB doesn't need to synchronize anything.

Your [OJB.properties](#) file need the following additional settings to work within managed environments (apply to **all** used api):

```
...
# only needed when using OJB 1.0.3 or earlier in managed environments. Since
version
# 1.0.4 OJB detects datasources from managed environments automatically.
ConnectionFactoryClass=
org.apache.obj.broker.accesslayer.ConnectionFactoryManagedImpl
```

```

...
# set used application server TM access class
JTATransactionManagerClass=
org.apache.obj.otm.transaction.factory.JBossTransactionManagerFactory

```

A specific *ConnectionFactory* implementation is used in version before 1.0.4 to by-pass all forbidden method calls in managed environments. Since OJB 1.0.4 datasources from managed environments are detected automatically by checking the *JTA-TxManager*.

The *JTATransactionManagerClass* property specify the used implementation class to lookup the *transaction manager* used by the application server. The `javax.transaction.TransactionManager` is needed to make it possible for OJB to participate in running *JTA transaction* via `javax.transaction.Synchronization` interface.

The ODMG-api needs some additional settings for use in managed environments (only needed when *odmg-api* was used):

```

...
# only needed for odmg-api
ImplementationClass=org.apache.obj.odmg.ImplementationJTAImpl

...
# only needed for odmg-api
OJBTxManagerClass=org.apache.obj.odmg.JTATxManager

```

The *ImplementationClass* specify the ODMG base class implementation. In managed environments a specific implementation is used, able to participate in *JTA transactions*.

The *OJBTxManagerClass* specify the used *OJBTxManager* implementation to manage the transaction synchronization in managed environments.

**Note:**

Currently OJB integrate in managed environments via `javax.transaction.Synchronization` interface. When the *JCA adapter* is finished (work in progress) integration will be more smooth.

### 5.1.2. 2. Declare datasource in the repository (*repository\_database*) file and do additional configuration

Do only use *DataSource* from the application server to connect to your database (Local used connections can not participate in *JTA transaction*).

**Note:**

We strongly recommend to use JBoss 3.2.2 or higher of the 3.x series of JBoss. With earlier versions of 3.x we got *Statement/Connection resource* problems when running some *ejb stress tests*. As workaround we introduce a *jboss specific attribute eager-release* for version before 3.2.2, but it seems that this attribute can cause side-effects. Again, this problem seems to be fixed in 3.2.2.

Define OJB to use a *DataSource*:

```

<!-- Datasource example -->
<jdbc-connection-descriptor
  jcd-alias="default"
  default-connection="true"
  platform="Sapdb"
  jdbc-level="2.0"
  jndi-datasource-name="java:DefaultDS"
  username="sa"
  password=""
  eager-release="false"
  batch-mode="false"
  useAutoCommit="0"

```

```

ignoreAutoCommitExceptions="false"
>
<object-cache class="org.apache.obj.broker.cache.ObjectCacheDefaultImpl">
  <attribute attribute-name="timeout" attribute-value="900"/>
  <attribute attribute-name="autoSync" attribute-value="true"/>
</object-cache>

<sequence-manager
className="org.apache.obj.broker.util.sequence.SequenceManagerNextValImpl">
</sequence-manager>
</jdbc-connection-descriptor>

```

In OJB versions before *1.0.4* the attribute `useAutoCommit="0"` is mandatory in managed environments, because it's in most cases not allowed to change the connection's *autoCommit* state.

#### Note:

In managed environments you can't use the *default* sequence manager implementation (*SequenceManagerHighLowImpl*) of OJB. For alternative sequence manager implementation [see here](#).

### 5.1.3. [2b. How to deploy obj test hsqldb database to jboss]

If you use hsql database for testing you can easy setup the DB on jboss. After creating the database in OJB test directory with `ant prepare-testdb`, take the generated `.../target/test/OJB.script` file and rename it to `default.script`. Then replace the jboss `default.script` file in `.../jboss-3.x.y/server/default/db/hypersonic` with this file.

### 5.1.4. 3. Include all OJB configuration files in classpath

Include the all needed OJB configuration files in your classpath:

- OJB.properties
- repository.dtd
- repository.xml
- repository\_internal.xml
- repository\_database.xml,
- repository\_ejb.xml (if you want to run the ejb examples)

To deploy the ejb-examples beans we include all configuration files in a ejb jar file - more info about this see [below](#).

The repository.xml for the [ejb-example beans](#) look like:

```

<?xml version="1.0" encoding="UTF-8"?>
<!-- This is a sample metadata repository for the ObjectBridge
System. Use this file as a template for building your own
mappings-->

<!-- defining entities for include-files -->
<!DOCTYPE descriptor-repository SYSTEM "repository.dtd" [
<!ENTITY database SYSTEM "repository_database.xml">
<!ENTITY internal SYSTEM "repository_internal.xml">
<!ENTITY ejb SYSTEM "repository_ejb.xml">
]>

<descriptor-repository version="1.0"
isolation-level="read-uncommitted">

  <!-- include all used database connections -->
  &database;

```

```

<!-- include ojb internal mappings here -->
        &internal;

<!-- include mappings for the EJB-examples -->
        &ejb;
</descriptor-repository>

```

#### 5.1.5. 4. Enclose all libraries OJB depend on

In most cases it is recommended to include all libraries OJB depend on in the application .ear/.sar or ejb .jar file to make OJB run and (re-)deployable. Here are the libraries needed to make the ojb sample session beans run on JBoss:

- The jakarta commons libraries files (all commons-xxx.jar) from OJB /lib directory
- The antlr jar file (antlr-xxx.jar) from OJB /lib directory
- jakarta-regexp-xxx.jar from OJB /lib directory
- [jakarta turbine jcs.jar from OJB /lib directory, only if ObjectCacheJCSImpl was used]

(This was tested with jboss 3.2.2)

#### 5.1.6. 5. Take care of caching

Very important thing is cache synchronization with the database. When using the ODMG-api or PB-api (with [special PBF \(see 1.\)](#) setting) it's possible to use all [ObjectCache](#) implementations as long as OJB doesn't run in a clustered mode. When the `ObjectCacheDefaultImpl` cache implementation was used it's recommended to enable the `autoSync` mode.

In clustered environments (OJB run on different AppServer nodes) you need a [distributed ObjectCache](#) or you should use a local/empty cache like

```
ObjectCacheClass=org.apache.ojb.broker.cache.ObjectCachePerBrokerImpl
```

or

```
ObjectCacheClass=org.apache.ojb.broker.cache.ObjectCacheEmptyImpl
```

The cache is pluggable, so you can write your own `ObjectCache` implementation to accomplish your expectations.

More info you can find in [clustering](#) and [ObjectCache](#) topic.

#### 5.1.7. 6. Take care of locking

If the used api supports *Object Locking* (e.g. ODMG-api, PB-api does not), in clustered environments (OJB run on different AppServer nodes) a distributed [lock management](#) is mandatory.

#### 5.1.8. 7. Put all together

Now put all files together. We keep the examples as simple as possible, thus we deploy only a ejb .jar file. [Below](#) you can find a short instruction how to pack an ejb application .ear file including OJB.

Generate the ejb-examples [described below](#) or build your own ejb .jar file including all beans, ejb-jar.xml and appServer dependend files. Then add all OJB configuration files, the db-ojb jar file and all libraries OJB depends on into this ejb .jar file.

The structure of the ejb .jar file should now look like this:

```

/OJB.properties
/repository.dtd

```

```

/repository.xml
/all used repository-XYZ.xml
/META-INF
../Manifest.mf
../ejb-jar.xml
../jboss.xml

/all ejb classes

/db-obj-1.X.jar
/all used libraries

```

### 5.1.9. 7b. Example: Deployable jar

For example the jar-file used to test the [ejb-examples](#) shipped with OJB, base on the *db-obj-XY-beans.jar* file. This jar was created when the [ejb-examples](#) target was called.

The generated jar contains only the ejb-classes and the deployment-descriptor. We have to add additional jars (all libraries used by OJB) and files (all configuration files) to make it deployable. The deployable *db-obj-XY-beans.jar* should look like this:

```

/OJB.properties
/repository.dtd
/repository.xml
/repository_database.xml
/repository_ejb.xml
/repository_internal.xml
/META-INF
../Manifest.mf
../ejb-jar.xml
../jboss.xml

/org
../apache (all ejb classes)

/db-obj-1.X.jar

/antlr-XXX.jar
/commons-beanutils-XXX.jar
/commons-collections-XXX.jar
/commons-logging-XXX.jar
/commons-pool-XXX.jar
/commons-logging-XXX.jar
/commons-pool-XXX.jar
/jakarta-regexp-XXX.jar

```

Please pay attention on the [configuration settings](#) to make OJB work in managed environments (especially the OJB.properties settings).

#### Note:

This example isn't a real world production example. Normally you will setup one or more enterprise archive files (.ear files) to bundle one or more complete J2EE (web) applications. More about how to build an *J2EE application* using OJB [see here](#).

The described example should be re-deployable/hot-deployable in JBoss.

**If you will get any problems, please let me know. All suggestions are welcome!**

### 5.1.10. 8. How to access OJB API?

In managed environments it is possible to access OJB in same way used in non-managed environments:

```

// PB-api
PersistenceBroker broker = PersistenceBrokerFactory.create...;

```

```
//ODMG-api
Implementation odmg = OJB.getInstance();
```

But it is recommended to bind OJB api access classes to JNDI and lookup the the api entry [classes via JNDI](#).

### 5.1.11. 9. OJB logging within JBoss

Jboss use [log4j](#) as standard logging api.

In summary, to use log4j logging with OJB within jBoss:

1) in OJB.properties set

```
LoggerClass=org.apache.ojb.broker.util.logging.Log4jLoggerImpl
```

There is no need for a separate log4j.properties file of OJB-specific log4j settings (in fact the OJB.properties setting LoggerConfigFile is ignored). Instead, the jBoss log4j configuration file must be used:

2) in JBOSS\_HOME/server/default/conf/log4j.xml,

define appenders and add categories to add or filter logging of desired OJB packages, following the numerous examples in that file. For example,

```
<category name="org.apache.ojb">
  <priority value="DEBUG" />
  <appender-ref ref="CONSOLE" />
  <appender-ref ref="FILE" />
</category>

<category name="org.apache.ojb.broker.metadata.RepositoryXmlHandler">
  <priority value="ERROR" />
  <appender-ref ref="CONSOLE" />
  <appender-ref ref="FILE" />
</category>
```

## 5.2. Example Session Beans

### 5.2.1. Introduction

The OJB source distribution was shipped with a bunch of sample session beans and client classes for testing. Please recognize that we don't say that these examples show "best practices" of using OJB within enterprise java beans - it's only one way to make it work.

To keep the examples as simple as possible we directly use the OJB main classes via static lookup or helper classes on each `ejbCreate()` call. But we recommend to [bind the OJB main classes](#) in JNDI instead of direct use in the session beans.

### 5.2.2. Generate the sample session beans

The source code of the sample beans is stored in directory

```
[db-ojb]/src/ejb/org/apache/ojb/ejb
```

To generate the sample beans call

```
ant ejb-examples
```

This ant target copies the bean sources to `[db-ojb]/target/src/ejb` generates all needed bean classes and deployment descriptor ([by using xdoclet](#)) to the same directory, compiles the sources and build an `ejb.jar` file called `[db-ojb]/dist/db-ojb-XXX-beans.jar`. Test clients for the generated beans included in the `[db-ojb]/dist/db-ojb-XXX-client.jar`.

To run xdoclet properly the following xdoclet jar files needed in `[db-ojb]/lib` directory

(xdoclet version 1.2xx or higher):

```
xdoclet-xxx.jar
xdoclet-ejb-module-xxx.jar
xdoclet-jboss-module-xxx.jar
xdoclet-jmx-module-xxx.jar
xdoclet-web-module-xxx.jar
xdoclet-xjavadoc-module-xxx.jar
```

If you using a different application server than JBoss, you have to modify the *xdoclet* ant target in `[db-objb]/build-ejb-examples.xml` to force xdoclet to generate the appServer specific files. See xdoclet documentation for further information.

### 5.2.3. How to run test clients for PB / ODMG - api

If the "extended `ejb.jar`" file was successfully deployed we need a test client to invoke the `ejb-examples`. As said above, the *ejb-examples* target generates a test client jar too. It's called `[db-objb]/dist/db-objb-XXX-client.jar` and contains junit based test clients for the PB-/ODMG-api.

The main test classes are:

- `org.apache.obj.ejb.AllODMGTests`
- `org.apache.obj.ejb.AllPBTests`

OJB provide an ant target to run the client side bean tests. Include all needed appServer libraries in `[db-objb]/lib` (e.g. for JBoss `jbossall-client.jar` do the job, beside the "j2ee jars"). To run the PB-api test clients (access running JBoss server with default settings) call

```
ant ejb-examples-run -Dclient.class=org.apache.obj.ejb.AllPBTests
```

To run the test clients on an arbitrary appServer pass the JNDI properties for naming context initialisation too, e.g.

- `-Djava.naming.factory.initial="org.jnp.interfaces.NamingContextFactory"`
- `-Djava.naming.provider.url="jnp://localhost:1099"`
- `-Djava.naming.factory.url.pkgs="org.jboss.naming:org.jnp.interfaces"`

Then the target call may looks like

```
ant ejb-examples-run -Dclient.class=org.apache.obj.ejb.AllPBTests
-Djava.naming.factory.initial="org.jnp.interfaces.NamingContextFactory"
-Djava.naming.provider.url="jnp://localhost:1099"
-Djava.naming.factory.url.pkgs="org.jboss.naming:org.jnp.interfaces"
```

## 5.3. Packing an .ear file

Here is an example of the `.ear` package structure. It is redeployable without having to restart JBoss.

### 5.3.1. The Package Structure

The package structure of the `.ear` file should look like:

```
/ejb.jar/
...EJBs
...META-INF/
.....ejb-jar.xml
.....jboss.xml
.....MANIFEST.MF

/web-app.war/
...JSP
...WEB-INF/
```

```

.....web.xml

/META-INF/
..application.xml
/obj.jar
/[obj required runtime jar]

/OJB.properties
/OJB-logging.properties
/repository.dtd
/respository_internal.xml
/repository.xml
/repository_database1.xml
/repository_appl.xml
/repository_database2.xml
/repository_app2.xml

```

### 5.3.2. Make OJB API Resources available

There are two approaches to use OJB api in the ejb.jar file:

1. To create a Manifest.mf file with classpath attribute that include all the runtime jar required by OJB (Very important to include all required jar). The sample below works fine (replace [version] with distributed JAR versions):

```

Class-Path: db-obj-[version].jar antlr-[version].jar
commons-beanutils-[version].jar
commons-collections-[version].jar commons-dbc-p-[version].jar
commons-lang-[version].jar
commons-logging-[version].jar commons-pool-[version].jar
jakarta-regexp-[version].jar

```

#### Note:

If you to include the jar file under a directory of the ear file, says /lib/db-obj-[version].jar and etc. At the classpath attribute it will be something like: Class-Path: ./lib/db-obj-[version].jar and etc (The "." in front is important)

2. To add the required jar file as a "java" element in the application.xml file:

```

<module>
  <java>antlr-[version].jar</java>
</module>
<module>
  <java>commons-beanutils-[version].jar</java>
</module>
<module>
  <java>commons-collections-[version].jar</java>
</module>
<module>
  <java>commons-dbc-p-[version].jar</java>
</module>
<module>
  <java>commons-lang-[version].jar</java>
</module>
<module>
  <java>commons-logging-[version].jar</java>
</module>
<module>
  <java>commons-pool-[version].jar</java>
</module>
<module>
  <java>db-obj-[version].jar</java>
</module>

```

#### Note:

To use this approach, all the library had to be in the root of the ear.

(This was tested on Jboss 3.2.3)

## 5.4. Make OJB accessible via JNDI

Current bean examples do directly use OJB main classes, but it's also possible to make OJB accessible via JNDI and use a JNDI-lookup to access OJB api's in your beans.

To make the OJB api's accessible via JNDI, bind main/access classes to JNDI. How to do this depends on the used environment. The main classes/methods to bind are:

- PB-api:  
Method  
`org.apache.ojb.broker.core.PersistenceBrokerFactoryFactory#instance()`  
returns the used  
`org.apache.ojb.broker.core.PersistenceBrokerFactoryIF`. Make this instance accessible via JNDI.
- ODMG-api:  
Method `org.apache.ojb.odmg.OJB#getInstance()` returns a new instance of the `org.odmg.Implementation` instance. Open a new Database and make this instance and the Database instance accessible via JNDI.

### 5.4.1. JBoss

In JBoss you can write *mbean* classes to bind OJB main/access classes to JNDI, similar to the [Weblogic example](#) below.

Let JBoss know about the new mbeans, so declare them in a `jboss-service.xml` file. Please see JBoss documentation how to write mbeans and bind objects to JNDI.

### 5.4.2. Other Application Server

In other application server you can do similar steps to bind OJB main api classes to JNDI. For example in Weblogic you can use *startup class* implementation to bind OJB main/access classes to JNDI (see [below](#)).

## 5.5. Instructions for Weblogic

1. Add the OJB jar files and dependencies into the Weblogic classpath
2. As usual create the connection pool and the datasource.
3. Prepare the OJB.properties file. Should be similar to [jboss](#). Expect the following entry:

```
...
# Weblogic Transaction Manager Factory
JTATransactionManagerClass=
org.apache.ojb.broker.transaction.tm.WeblogicTransactionManagerFactory
```

4. Modify the connection information in the repository.xml (specify the datasource name). SequenceManager implementation depends on the used DB, more info [see here](#):

```
<jdbc-connection-descriptor
jcd-alias="default"
default-connection="true"
platform="Sapdb"
jdbc-level="2.0"
jndi-datasource-name="datasource_demodb"
eager-release="false"
batch-mode="false"
useAutoCommit="0"
ignoreAutoCommitExceptions="false"
```

```
>
<sequence-manager
className="org.apache.obj.broker.util.sequence.SequenceManagerNextValImpl">
<attribute attribute-name="grabSize" attribute-value="20"/>
</sequence-manager>
</jdbc-connection-descriptor>
```

**Note:**

The following step is only necessary if you want to bind OJB main api classes to JNDI.

[5.] Compile the following classes (see at the [end of this section](#)) and add them to the weblogic classpath. This allows to access the PB-api via JNDI lookup. Register via the weblogic console the startup class (see `OjbPbStartup` class below). The JNDI name and the `OJB.properties` file path can be specified as parameters in this startup class.

To use the ODMG-api you have to write a similar startup class. This shouldn't be too complicated. Take a look in `org.apache.obj.jboss` package (dir `src/connector/main`). Here you could find the `jboss mbeans`. All you have to do is bound a similar class to JNDI in weblogic. Implement `ODMGJ2EEFactory` Interface in your class bound this class to JNDI (in the `ejb-examples` the beans try to lookup the `Implementation` instance via `"java:/obj/defaultODMG"`). Your `ODMGFactory` class should implement this method

```
public Implementation getInstance()
{
    return OJB2EE_2.getInstance();
}
```

Write a session bean similar to those provided for the JBOSS samples. It is also possible to use the `ejb-example` beans (doing minor modifications when the JNDI lookup should be used).

*Weblogic startup class*

Write an OJB startup class to make OJB accessible via JNDI can look like (I couldn't test this sample class, so don't know if it will work ;-)):

```
package org.apache.obj.weblogic;

import javax.naming.*;

import org.apache.obj.broker.core.PersistenceBrokerFactoryFactory;
import org.apache.obj.broker.core.PersistenceBrokerFactoryIF;

import weblogic.common.T3ServicesDef;
import weblogic.common.T3StartupDef;
import java.util.Hashtable;

/**
 * This startup class created and binds an instance of a
 * PersistenceBrokerFactoryIF into JNDI.
 */
public class OjbPbStartup
    implements T3StartupDef, OjbPbFactory, Serializable
{
    private String defaultPropsFile = "org/apache/obj/weblogic/OJB.properties";

    public void setServices(T3ServicesDef services)
    {
    }

    public PersistenceBrokerFactoryIF getInstance()
    {
        return PersistenceBrokerFactoryFactory.instance();
    }

    public String startup(String name, Hashtable args)
```

```

        throws Exception
    {
        try
        {
            String jndiName = (String) args.get("jndiname");
            if(jndiName == null || jndiName.length() == 0)
                jndiName = OjbPbFactory.DEFAULT_JNDI_NAME;

            String propsFile = (String) args.get("propsfile");
            if(propsFile == null || propsFile.length() == 0)
            {
                System.setProperty("OJB.properties", defaultPropsFile);
            }
            else
            {
                System.setProperty("OJB.properties", propsFile);
            }

            InitialContext ctx = new InitialContext();
            bind(ctx, jndiName, this);

            // return a message for logging
            return "Bound OJB PersistenceBrokerFactoryIF to " + jndiName;
        }
        catch(Exception e)
        {
            e.printStackTrace();
            // return a message for logging
            return "Startup Class error: impossible to bind OJB PB factory";
        }
    }

    private void bind(Context ctx, String name, Object val)
        throws NamingException
    {
        Name n;
        for(n = ctx.getNameParser("").parse(name); n.size() > 1; n =
n.getSuffix(1))
        {
            String ctxName = n.get(0);
            try
            {
                ctx = (Context) ctx.lookup(ctxName);
            }
            catch(NameNotFoundException namenotfoundexception)
            {
                ctx = ctx.createSubcontext(ctxName);
            }
        }
        ctx.bind(n.get(0), val);
    }
}

```

The used OjbPbFactory interface:

```

package org.apache.ojb.weblogic;

import org.apache.ojb.broker.core.PersistenceBrokerFactoryIF;

public interface OjbPbFactory
{
    public static String DEFAULT_JNDI_NAME = "PBFactory";
    public PersistenceBrokerFactoryIF getInstance();
}

```