

## Installing and Configuring the JBoss Application Server

In Appendix E of *EJB 3 in Action*, we provide instructions to install and configure the ActionBazaar application using the GlassFish reference implementation. However, it is very likely that you will use an implementation other than GlassFish in your production environment, such as JBoss, WebSphere or WebLogic. Here, we will provide you the instructions to get the sample code up and running using the JBoss application server.

As you probably already know, JBoss is the premier open source Java application server. The JBoss folks, Gavin King and Bill Burke in particular, have been at the forefront of the EJB 3 specification. Not surprisingly, JBoss has provided one of the earliest implementations of EJB 3. In fact, one of the most interesting products JBoss offers is an embeddable EJB 3 container. This embeddable container can be used to enable EJB 3 outside the application server such as in JUnit tests or inside a Servlet container like Tomcat. You can find out more about Embedded JBoss at <http://wiki.jboss.org/wiki/Wiki.jsp?page=EmbeddedJBoss>. We won't focus on the embedded container right now since it involves a little more work to get up and running. Instead, we will tackle the simpler case of bootstrapping the sample code in the JBoss application server itself.

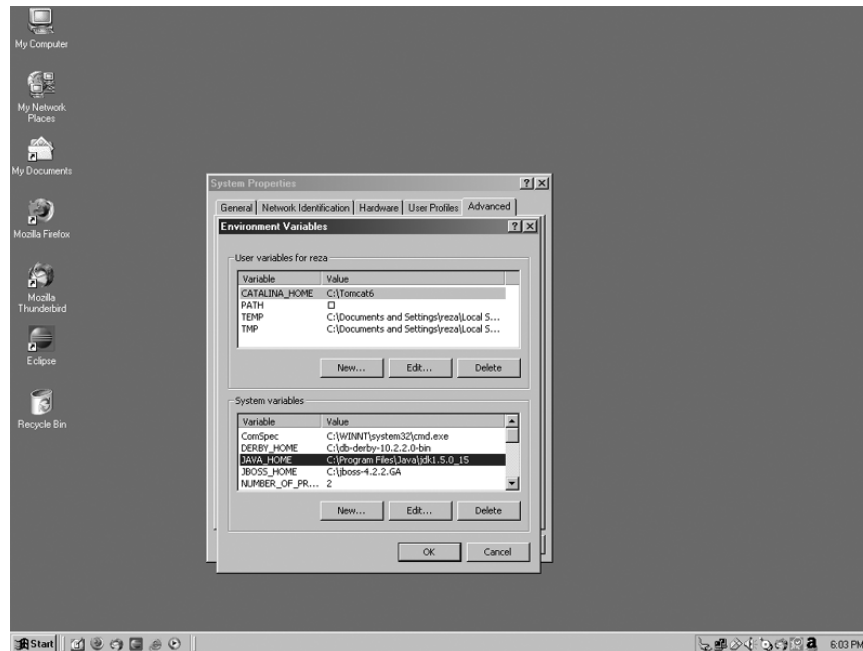
The instructions in this Appendix are for a Windows machine, but they can be easily adapted for any other operating system such as Linux. The installation and configuration instructions can be broken down into three distinct steps:

1. Installing JBoss AS.
2. Installing and running the ActionBazaar application.

### Installing the JBoss Application Server

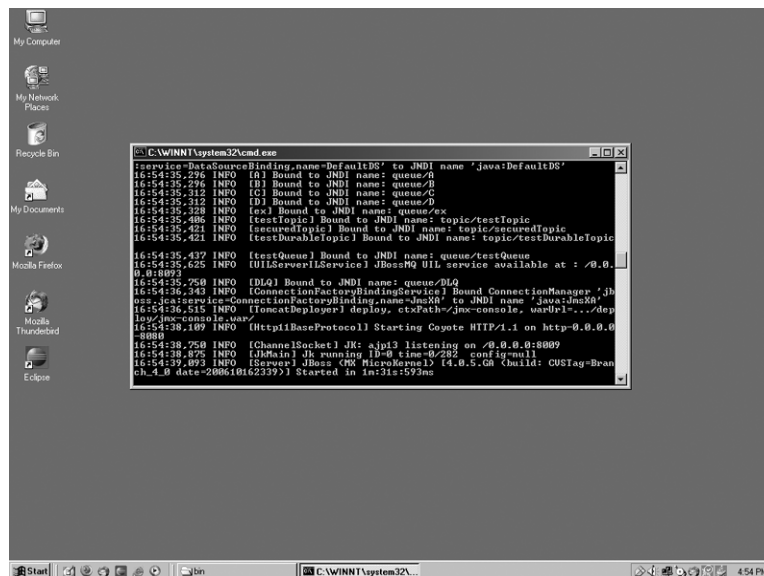
JBoss AS 4.0.5 and above include EJB 3 support. We chose JBoss AS 4.2.2.GA, the latest stable release. You can download and install JBoss AS as follows:

1. Go to <http://labs.jboss.com/jbossas/downloads>. Download the version of JBoss AS you want to work with. The file we downloaded is named `jboss-4.2.2.GA.zip`. Unzip this file into the C drive. The complete path should look like `C:\jboss-4.2.2.GA`. EJB 3 support requires Java SE 5 or higher, so make sure you have the JDK installed first. You should have both the `JAVA_HOME` and `JBOSS_HOME` environment variables set. While `JAVA_HOME` should point to your JDK installation, `JBOSS_HOME` should be set to `C:\jboss-4.2.2.GA`. You can set these environment variables through My Computer->Properties->Advanced->Environment Variables. Your environment variable entries should look something like Figure F.1.



**Figure F.1: The JAVA\_HOME and JBOSS\_HOME environment variables.**

2. At this point, you should verify that the application server is installed correctly. You can start the application server by running the run.bat file located under %JBOSS\_HOME%\bin. %JBOSS\_HOME% is the directory where JBoss AS is installed. Locate the run.bat file and double-click to run it. This script will expect the %JAVA\_HOME% directory to be set to a Java SE 5 JDK. After running this script, you will see a screen similar to F.2.



**Figure F.2: The JBoss AS startup script.**

3. You should now access the JBoss AS console through <http://localhost:8080/>. This page is shown in Figure F.3.

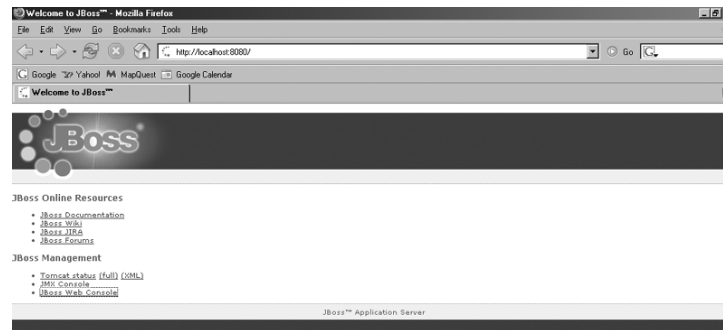


Figure F.3: The JBoss AS welcome page.

4. Click on the “JBoss Web Console” link on this page. This will open up the JBoss AS console pictured in Figure F.4. You should take a moment to explore the console before moving forward further.

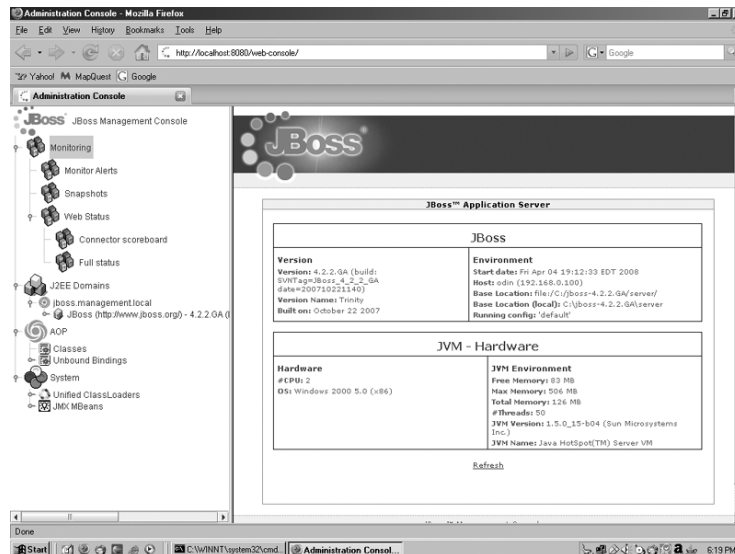


Figure F.4: JBoss Web Console.

Now that JBoss AS is up and running, you are ready to install and run the ActionBazaar application.

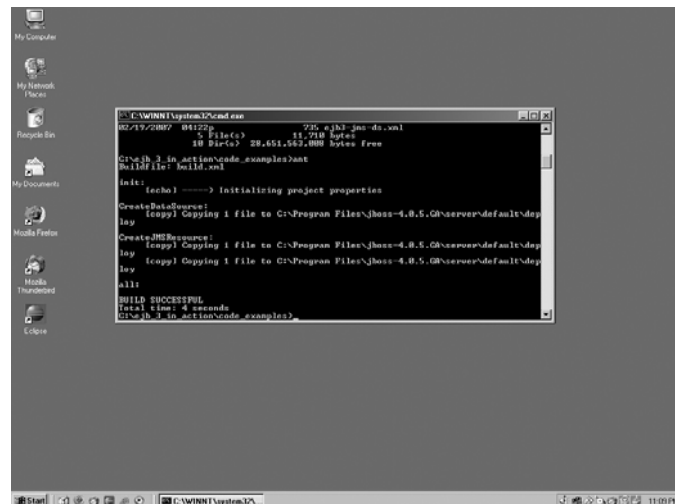
## Installing and Running the ActionBazaar Application

If you are familiar with JBoss AS, you know that you can install and configure an application manually by copying files to the deployment directory. To make things a

little easier on you, we are going to take a slightly simpler route. The ActionBazaar source code comes with Ant build scripts to deploy the application. If you are unfamiliar with Apache Ant, feel free to read-up on it at: <http://ant.apache.org>. Simply speaking, Ant is a way of automating common project configuration and deployment tasks that you would do by hand. Feel free to explore the XML Ant scripts we have supplied on your own.

5. The first step to installing the application is to download the source code bundle from <http://manning.com/panda/>. The source file bundle is named `codeexamples-jbossas.zip`. Unzip the source into any directory such as `c:\ejb_3_in_action\code_examples`.
6. We assume that you will be using the embedded Hypersonic database (HSQLDB) shipped with JBoss so the data sources in the Ant setup script are for HSQLDB. However, you could use any other database such as Derby, MySQL, PostgreSQL or the free Oracle XE (<http://www.oracle.com/technology/products/database/xe/index.html>) database. You'll simply need to make the appropriate changes to the Ant tasks.
7. If you plan to use a database other than HSQLDB, don't forget to copy the JDBC driver to the `%JBoss_HOME%\server\default\deploy\lib` directory and restart server. For example, in case of the Oracle XE database the copy the `ojdbc14.jar` JDBC driver to the server library directory.
8. Open up a command window. Type in:  
`cd c:\ejb_3_in_action\code_examples`  
`ant`

This will prepare data sources and JMS resources necessary for the database. The output of the Ant task is shown in Figure F.5.



```
C:\WINNT\System32\cmd.exe
02/19/2007 08:22:22  C:\ejb_3_in_action\code_examples>ant
Buildfile: build.xml

init:
[echo] -----> Initializing project properties

CreateDataSource:
[copy] Copying 1 file to C:\Program Files\JBoss-4.0.5.GA\server\default\deploy
log

CreateJMSResource:
[copy] Copying 1 file to C:\Program Files\JBoss-4.0.5.GA\server\default\deploy
log
[copy] Copying 1 file to C:\Program Files\JBoss-4.0.5.GA\server\default\deploy
log
All:
BUILD SUCCESSFUL
Total time: 4 seconds
C:\ejb_3_in_action\code_examples>
```

**Figure F.5: The output from the command-line Ant task to setup the data sources and JMS resources necessary for the ActionBazaar application.**

9. You are now ready to start deploying the examples for each Chapter. Each Chapter example is packaged into a separate application. To deploy an example

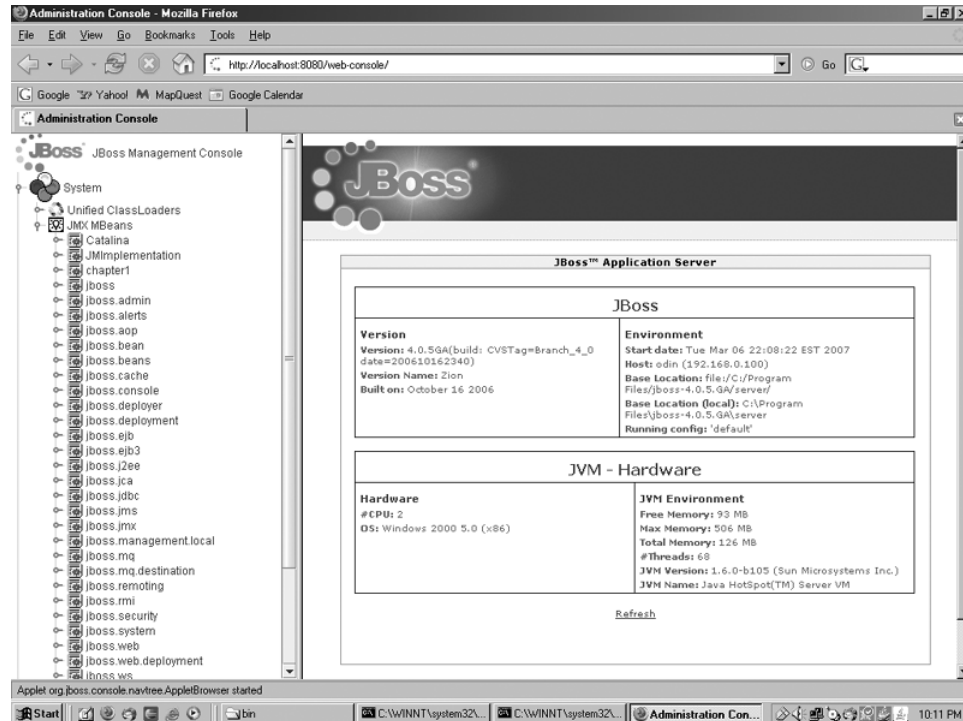
application, move into the directory for the chapter and run the Ant task. For example, to deploy the application for Chapter 1, run:

```
cd chapter1
```

```
ant
```

This Ant task will compile the classes, package as an ejb-jar/EAR and then deploy into the JBoss AS server.

10. To verify that the application was deployed, open up the JBoss Web Console. In the administration console, expand System->JMX MBeans. As shown in Figure F.6, you will see that chapter1 has been deployed.



**Figure F.6: The chapter1 application deployed to JBoss.**

11. You can run the deployed application by typing:

```
ant run
```

The output printed by the EJB will be printed to the console of the application server. In our case, the command window for the server will have the entry shown in Figure F.7.

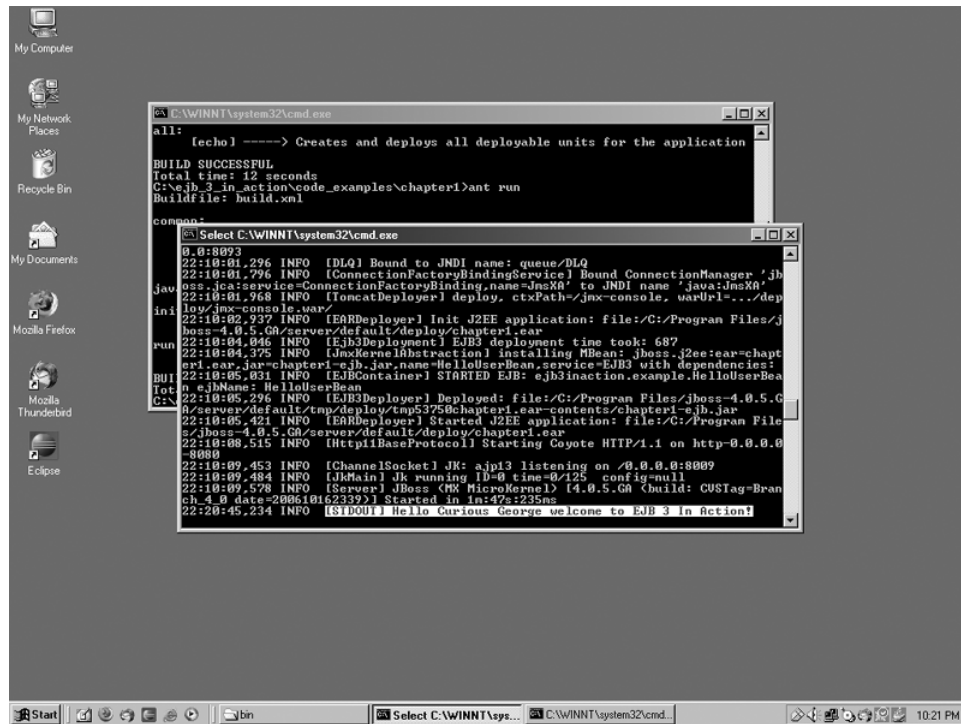


Figure F.7: The output of running the deployed application for Chapter 1.

12. You can explore the code further by opening it up in an IDE. At the time of writing NetBeans has the best support for EJB 3 and Java EE 5 in general. However, it is very likely that other popular IDEs like Eclipse will also catch up very soon.