# Content Server

Version: 6.3

# Installing Content Server with JBoss Application Server

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FatWire SOFTWARE

*Installing Content Server with JBoss Application Server*
Document Revision Date: Jul. 27, 2006
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Chapter 1

# Installation Overview

This document provides guidelines for installing Content Server on JBoss 4 Application Server, connecting to a supported database of your choice.

**Note**

Anyone using this guide is expected to have experience installing and configuring databases, web servers, and application servers. Selected information regarding the configuration of third-party products is given in this guide. For detailed information about a particular third-party product, refer to that product's documentation.

This chapter provides information that will help you prepare for the Content Server installation. It contains the following sections:


- What This Guide Covers
- Installation Summary
- System Requirements
- Graphics in This Guide
- Graphics in This Guide
- Installation Steps

# What This Guide Covers

This guide covers the installation, configuration, and maintenance of JBoss Application Server, as required to support Content Server. This includes configuration of one or more JBoss instances, clustering, SSL, along with backend databases.

# Installation Summary

After you install and configure the J2EE components that support Content Server, run the Content Server installer. Run the installer on each development, delivery, and management system on which you plan to use Content Server. During the Content Server installation, you will have the option to install or bypass sample sites and sample contents.

**Note**

The names of the systems in your Content Server environment might vary from the names used in this document. Generally, the management system is also called “staging,” and the delivery system is also called “production.”

# System Requirements

System requirements for installing Content Server are given in the following documents located on your Content Server installation CD:

- *Content Server Supported Platform List*. The list specifies third-party databases and drivers, application servers and web servers, and other software required for installing and running Content Server.
- *Content Server Release Notes*

FatWire recommends that you read both of these documents before installing Content Server.

**Note**

The latest versions of the above-mentioned documents are located at the following URL (password-protected):

`http://e-docs.fatwire.com/CS`

If you need a password, contact FatWire Technical Support. Contact information is available at the following URL:

`http://www.fatwire.com/Support/contact_info.html`

The e-docs website is organized by product and version number. To obtain the correct documents, follow the link for the version of Content Server you are installing.

# Graphics in This Guide

Many steps in this guide include screen captures of dialog boxes and similar windows that you interact with in order to complete the steps. These screen captures are presented to help you follow the installation process. They are not intended to be sources of specific information, such as parameter values, options to select, or product version number.

# Installation Steps

The steps below summarize the installation/configuration of Content Server and its supporting software. Keep the steps handy as a quick reference to the installation procedure and to the chapters that provide more detailed instructions.

### To install Content Server and its supporting software

1. Ensure that you have licensed copies of all the software you will be installing. For information about Content Server's supporting software, refer to the *Content Server Supported Platform List* and *Release Notes*. The latest versions are available on the e-docs website (password-protected), at the URL that is given in "System Requirements," on page 6.
2. Set up your choice of supported databases by installing the database management system, creating a database for Content Server, and configuring the database. For instructions, see our configuration guide, *Third-Party Software.*
3. Set up JBoss Application Server, as shown in Chapter 3, "Installing JBoss Application Server." The steps that you will complete are the following:
   a. Install JBoss 4 Application Server.
   b. Set up the environment and test the application server.
4. Configure JBoss Application Server, as shown in "Post-Installation Steps" in Chapter 3, "Installing JBoss Application Server."
5. Install Content Server by running the installer. Halfway through the installation, you will need to deploy Content Server. For instructions on installing and deploying Content Server, see Chapter 5, "Installing Content Server."
6. If you plan to use the Verity search engine, follow installation guidelines in "Installing Verity Search Engine," on page 64.
7. If you plan to set up a clustered installation, follow instructions in "Installing Content Server in a Clustered Environment," on page 60.

Part 1

# Database

This part contains a short chapter summarizing the databases that Content Server uses. Instructions on creating and configuring the databases are given in our configuration guide, *Third-Party Software.*

This part contains the following chapter:


- Chapter 2, “Setting Up a Database”

Chapter 2

# Setting Up a Database

Content Server requires access to a supported database that is specifically configured for Content Server. Supported databases for this release include:

- Oracle 9
- Oracle 10*g*
- Microsoft SQL Server 2000 SP3 and SP4
- DB2

The complete list of supported databases (as well as other third-party components) is given in the *Supported Platform List* (accessible from `http://e-docs.fatwire.com/CS`).

Before installing any other of Content Server's supporting software, you must complete the following steps:

1. Install the database management system.
   For instructions, refer to the product vendor's documentation.
2. Create and configure a database for Content Server.
   For instructions, consult our configuration guide, *Third-Party Software.* Note that database configuration is identical across different application servers. Refer to the correct chapter to create and configure the database of your choice.

Part 2

# Application Server

This part contains information about installing and configuring JBoss Application Server divided into the following chapters:

- Chapter 3, “Installing JBoss Application Server”

Chapter 3

# Installing JBoss Application Server

This chapter provides instructions for installing JBoss Application Server so far as needed to install and run Content Server. For more information on the installation process, see the documentation that comes with JBoss.

This chapter contains the following sections:


- Installation Steps
- Post-Installation Steps

# Installation Steps

To install JBoss Application Server:

1. Create a JBoss installation directory.
2. Decompress the `jboss-4.0.2.tar.gz` file into the JBoss installation directory:

   ```
   gzip –d jboss-4.0.2.tar.gz
   tar –xvf jboss-4.0.2.tar
   ```

3. Set `JAVA_HOME` to the `jdk` folder of the version of Java that will be used. The Java version must be 1.4 or higher.

   **Ex**: `export JAVA_HOME= /u01/software/App/WebLogic814/jdk142_05`

4. Start the application server by running the startup command from the `bin` directory:

   ```
   cd <path to JBoss install directory>/bin
   ./run.sh
   ```

   This command will run the default JBoss instance on `port 8080`.

5. Enter the following url into a browser: `http://<hostname>:8080/`
   When the default "JBoss Application Server" home page is displayed, click **JBoss Web Console** to display the JBoss Management Console.
6. Shut down the application server by doing one of the following:
   - From the JBoss Web Console, right-click in the JBoss Management Console and when the menu appears, click **Shutdown JBoss instance**.
   - From the console, run the shutdown command:

     ```
     <path to JBoss install directory>/bin/shutdown.sh –s jnp://
     <hostname>:1099
     ```

     where the `–s` option allows you to specify which instance of JBoss to shut down. Port `1099` is the jnp port for the default instance where jnp is the socket/RMI-based protocol used by JBoss.

# Post-Installation Steps

### Set Up Directories

1. Create a directory for ContentServer:

   ```
   mkdir CS63
   ```

2. Create a new JBoss instance:

   ```
   cd <path to JBoss install directory>/server/
   ```

   As this instance has all the properties of a JBoss **all** instance, copy the **all** instance folder:

   ```
   cp –R all fatwire
   ```

   In this guide we will call the new instance "fatwire". However, you may name the instance as you wish.

3. Refer to the data source information that corresponds to the database you will be using (see page 17) and place the required files in:

   `<path to JBoss install directory>/server/<instance name>/lib`

   **Data Source Information**

   - Microsoft SQL Server

```
DriverClass: com.microsoft.jdbc.sqlserver.SQLServerDriver
Required .jar files: mssqlserver.jar msbase.jar msutil.jar
Url: jdbc:microsoft:sqlserver://
     <hostname>:1433;SelectMethod=Cursor;DatabaseName=<dbname>
Ex: jdbc:microsoft:sqlserver://
10.120.14.22:1433;SelectMethod=Cursor;DatabaseName=CS62_JBoss
```

   - JTDS (third-party driver)

```
DriverClass: net.sourceforge.jtds.jdbc.Driver
Required .jar files: jtds-1.1.jar
Url: jdbc:jtds:sqlserver://<hostname>:1433/<dbname>
Ex: jdbc:jtds:sqlserver://10.120.14.22:1433/CS62_JBoss
```

   - DB2

```
DriverClass: com.ibm.db2.jcc.DB2Driver
Required .jar files: db2jcc.jar, db2cc_license_cu.jar
Url: jdbc:db2://<hostname>:<dbport>/<dbname>
Ex: jdbc:db2://10.120.16.30:50001/WL814CS
```

   - Oracle

```
DriverClass: oracle.jdbc.driver.OracleDriver
Required .jar files: ojdbc14.jar, orai18n.jar
Url: jdbc:oracle:thin:@//<hostname>:1521/<dbname>
Ex: jdbc:oracle:thin:@//godzilla.fatwire.com:1521/LINKSYS
```

4. Create a new datasource file:

   a. Create a new datasource file named `<database type>-ds.xml` in the directory `<path to JBoss install directory>/server/<instance name>/deploy` and paste in the xml shown below:

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources>
  <local-tx-datasource>
    <jndi-name>jdbc/csDataSource</jndi-name>
    <connection-url><Url> </connection-url>
    <driver-class><Driver Class></driver-class>
    <user-name><User></user-name>
    <password><Password></password>
  </local-tx-datasource>
</datasources>
```

   b. Replace the `<Url>` and the `<Driver Class>` text fragments with the url and driver class selected from the above.

**c.** Replace the `<User>` and `<Password>` text fragments with the user information that you connect to your database with.

**5.** In this step, you will test the new instance by starting it and connecting to the JBoss Management Console. Do the following:

**a.** Make sure that the default instance is shut down before trying to start the new one. If you can view `http://<hostname>/web-console/` in your browser, then the instance needs to be shut down. Use the following command to shut down the default instance:

```
<path to JBoss install directory>/bin/shutdown.sh –s jnp://
<hostname>:1099
```

**b.** Start the new instance with the following command:

```
<path to JBoss install directory>/bin/run.sh –c fatwire
```

**c.** With your browser, open `http://<hostname>:8080/web-console/` to view the JBoss Management Console. If you plan to use SSL, go to the SSL section; otherwise, you are ready to install Content Server.

## Running Multiple Instances of JBoss Simultaneously

This section shows the steps that you need to take if multiple JBoss instances will be running.

**1.** Shut down the instance.

```
<path to JBoss install directory>/bin/shutdown.sh –s jnp://
<hostname>:1099
```

**2.** No two JBoss instances can use the same ports. If they do, change the ports as follows:

**a.** Change to the `/conf` directory of your instance.

```
cd <path to JBoss install directory>/server/<instance name>/
   conf
```

**b.** Open the jboss-`service.xml` file in a text editor and find the “Service Binding” section. Look for the following xml code:

```
   <mbean
code="org.jboss.services.binding.ServiceBindingManager"
     name="jboss.system:service=ServiceBindingManager">
     <attribute name="ServerName">ports-01</attribute>
     <attribute name="StoreURL">${jboss.home.url}/docs/
examples/binding-manager/sample-bindings.xml</attribute>
     <attribute name="StoreFactoryClassName">
       org.jboss.services.binding.XMLServicesStoreFactory
     </attribute>
   </mbean>

   -->
```

The `StoreURL` attribute holds the path to a file, which by default contains four different port configurations. These configurations are named `ports-default`, `ports-01`, `ports-02`, and `ports-03`.

- To access these configurations, uncomment the code above (by deleting the "close comment" tag (`-->`) at the end of the code and inserting it above the opening `<mbean` tag).
- The `ServerName` attribute holds the value of the port configuration that this instance will be using. To use a configuration other than `ports-01`, change the value according to Table 1, on page 19.
- To view which ports each configuration uses, view the `<path to JBoss install directory>/docs/examples/binding-manager/sample-binding.xml` file.

3. If the instances are not already running, start them with the command:

   **`<path to JBoss install directory>/bin/run.sh –c <instance name>`**

4. Test that two instances can be run simultaneously by loading in your browser the URL, `http://<hostname>:<port for new instance>/web-console/` to display the JBoss Management Console. If the `ports-01` configuration is being used, the port will be `8180`.

## Important Commands and Ports

**Note**

All commands are based on the assumption that `JAVA_HOME` is set to the proper directory.

- To start the JBoss instance:

  **`<path to JBoss install directory>/bin/run.sh –c <instance name>`**

- To shut down the JBoss instance:

  **`<path to JBoss install directory>/bin/shutdown.sh –s jnp://<hostname>:<jnp port>`**

**Table 1:** Port Configurations

| Port Configuration | Web Service Port | JNP Port |
|---|---|---|
| ports-default | 8080 | 1099 |
| ports-01 | 8180 | 1099 |
| ports-02 | 8280 | 1299 |
| ports-03 | 8380 | 1399 |

Part 4

# Web Server

This part shows you how to integrate the Apache web server with JBoss.

This part contains the following chapter:

- Chapter 4, “Installing and Configuring a Web Server”

Chapter 4

# Installing and Configuring a Web Server

This chapter contains information about configuring Apache 2.0.x. It contains the following sections:


- Integrating JBoss with Apache 2.0.x
- Configuring JBoss for SSL Through Apache 2.0.x

# Integrating JBoss with Apache 2.0.x

This section shows the steps to configure Apache 2.0.x.

1. Install Apache 2.0.x
2. Set `$APACHE2_HOME` to the directory in which Apache was installed.
3. Download and compile the newest release of `mod_jk`.
4. After downloading `mod_jk`, untar it using the commands:

   ```
   gunzip jakarta-tomcat-connectors-1.2.14.1-src.tar.gz
   tar –xvf jakarta-tomcat-connectors-1.2.14.1-src.tar
   ```

5. Go to the directory `jakarta-tomcat-connectors-<version>-src/jk/native`:

   ```
   cd jakarata-tomcat-connectors-1.2.14.1-src/jk/native
   ```

6. Configure and compile the `mod_jk.so` file:

   ```
   ./configure --with-apxs=$APACHE2_HOME/bin/apxs
   ```

   **make**

   ```
   cd apache-2.0
   $APACHE2_HOME/bin/apxs –n jk –i mod_jk.so
   ```

   The last command will automatically place the `mod_jk`.so file into your `$APACHE2_HOME/modules` directory.

7. Create `workers.properties` in `$APACHE2_HOME/conf` with the following contents:

   ```
   ps=/
   worker.list=jboss

   worker.jboss.port=<ajp port>
   worker.jboss.host=<hostname>
   worker.jboss.type=ajp13
   worker.jboss.lbfactor=1
   ```

   (The ajp port can be found in `<path to JBoss install directory>/server/<instance name>/deploy/jbossweb-tomcat55.sar/server.xml` under AJP 1.3 Connector. The default value is `8009`.)

8. Edit `$APACHE2_HOME/conf/httpd.conf` by adding the following to the LoadModules section:

```
Load Module jk_module modules/mod_jk.so
Before Section 3:
#
# Mod_jk settings
#

    JkWorkersFile "conf/workers.properties"
    JkLogFile "logs/mod_jk.log"
    JkLogLevel info
    JkMount /cs/* jboss

# End of mod_jk settings
```

9. Test `httpd.conf` with the following:

```
cd $APACHE2_HOME/bin
apachectl configtest
```

   You will see a warning message and then "`Syntax OK`". Ignore the warning.

10. Start JBoss:

```
<path to JBoss install directory>/bin/run.sh –c <instance name>
```

11. Start Apache:

```
$APACHE2_HOME/bin/apachectl start
```

12. Load `http://<hostname>/cs/` to verify that the `/cs directory` is displayed.

# Configuring JBoss for SSL Through Apache 2.0.x

1. Generate a self-signed certificate:
   a. Edit `openssl.cnf` (usually in `/etc/ssl/`) to have the line `dir = $APACHE2_HOME/demoCA`
   b. Set up the environment for the certificate authority certificate:

```
cd $APACHE2_HOME
mkdir demoCA
cd demoCA
mkdir certs
mkdir crl
touch index.txt
mkdir newcerts
echo “01” > serial
mkdir private
cd ..
```

   c. Generate certificate authority key (only needs to be done the first time certificate is created):

```
openssl genrsa –out ca.key 1024
```

   d. Create a self-signed certificate authority certificate:
      1) Enter the command:
      **`openssl req -new -x509 -key ca.key -out demoCA/cacert.pem`**
      2) You will be prompted to fill in the following fields:

```
Country Name (2 letter code):
State or Province Name (full name):
Locality Name (eg, city):
Organization Name (eg, company):
Organizational Unit Name (eg, section):
Common Name (eg, your name or your server’s hostname):
Email Address:
```

**e.** Create the keystore by entering the following commands (in bold) and filling in the fields (in quotes) with the information you used in the previous step:

**keytool -genkey -alias serverapp -dname** "cn=<common name>, ou=<organizational unit>, o=<organization>, L=<locality>, S=<state>, C=<country>" **-storepass fatwire -keypass fatwire -keystore newcerts**

**f.** Export the keys for the keystore:

**keytool -keystore newcerts -certreq -alias serverapp -keypass fatwire -storepass fatwire -file serverapp.crs**

**g.** Sign the exported key:

**1)** Enter the command:

**openssl ca -in serverapp.crs -out serverapp.pem -keyfile ca.key**

**2)** You will be prompted to confirm the information you had entered in the previous steps. Confirm by entering "y" in the following fields:

```
Sign the certificate?
1 out of 1 certificate requests certified, commit?
```

**h.** Convert the keys to der:

**openssl x509 -in serverapp.pem -out serverapp.der -outform DER**

**i.** Import the certificate authority certificate and the keys to the keystore:

**1)** Enter the command:

**keytool -keystore newcerts -alias fatwirecs -keypass fatwire -storepass fatwire -import -file demoCA/cacert.pem**

**2)** The certificate is displayed. Type in `yes` to continue.

```
Valid from: Mon Apr 11 04:58:46 PDT 2005 until: Wed May
11 04:58:46 PDT 2005
Certificate fingerprints:
MD5:  80:B1:67:7A:46:17:3A:31:4D:23:38:57:47:19:2B:C5
SHA1:C7:AB:55:B3:9D:8F:DF:4A:BE:C2:48:11:8D:51:F8:17:35:2
E:4C:B3
Trust this certificate?:
```

**2.** Edit the `ssl.conf` file (located in `$APACHE2_HOME/conf/ssl.conf`) as shown below.

**a.** Fill in the following fields:

> **Note**
>
> By default, the SSL port is 443. If this server runs simultaneously with another Apache or Apache2 server, the SSL port will need to be changed from 443, to some other unused port.

```
Listen <ssl port>
<VirtualHost _default_:<ssl port>>
```

```
ServerName <hostname>:<ssl port>
ServerAdmin you@example.com
```

**b.** Edit the following lines so they point to the certificate and key files:

```
SSLCertificateFile <$APACHE2_HOME>/demoCA/cacert.pem
SSLCertificateKeyFile <$APACHE2_HOME>/ca.key
```

3. Restart the Apache web server and load `http://<hostname>:<ssl port>/web-console/`.
4. You will be prompted to accept the certificate. Once you accept, the JBoss Management Console is displayed.

Part 5

# Content Server

This part shows you how to proceed through the installation of Content Server. It contains the following chapter:

- Chapter 5, “Installing Content Server”

Chapter 5

# Installing Content Server

This chapter shows you how to install Content Server on JBoss Application Server. This chapter contains the following sections:


- Pre-Installation Steps
- Install Content Server
- Installing Content Server in a Clustered Environment
- Post Installation Steps
- Installing Verity Search Engine

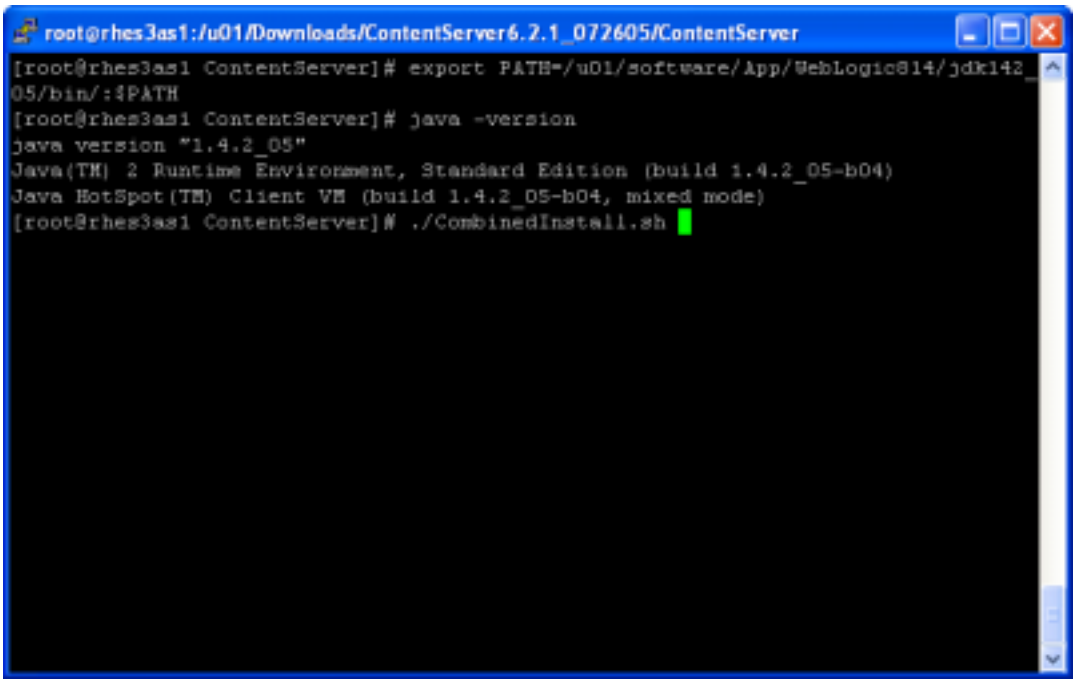
# Pre-Installation Steps

Before installing Content Server, make sure you have completed the following:

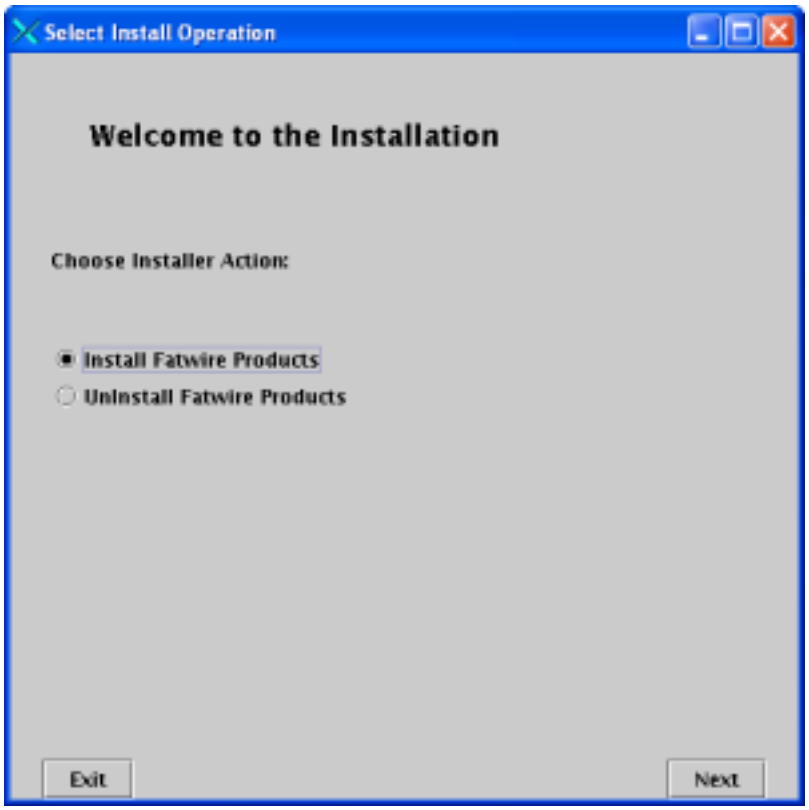
- Obtained a license with the correct IP address and ports.
- Ensured that JBoss instance is started.
- Installed JBoss Application Server as shown on page 16.
- Created a valid directory into which you plan to install Content Server.
- For clustered installations: You have created a valid shared directory into which you plan to install the Content Server shared file system

# Install Content Server

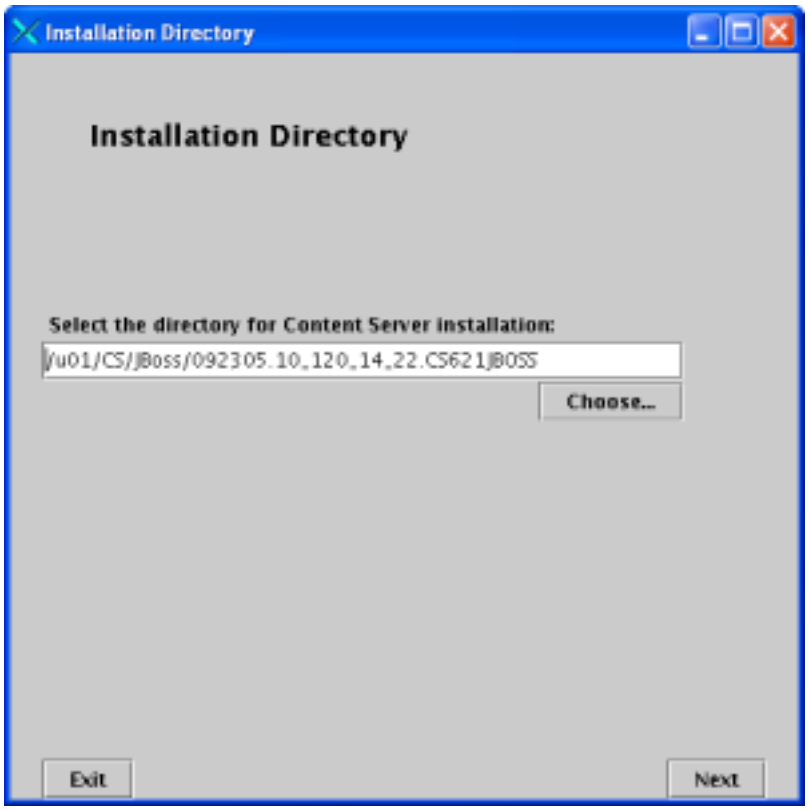
1. Start the Content Server installer by changing to the Content Server installer directory and running **`./CombinedInstall.sh`**



2. Select the option **Install FatWire Products** and click **Next**.



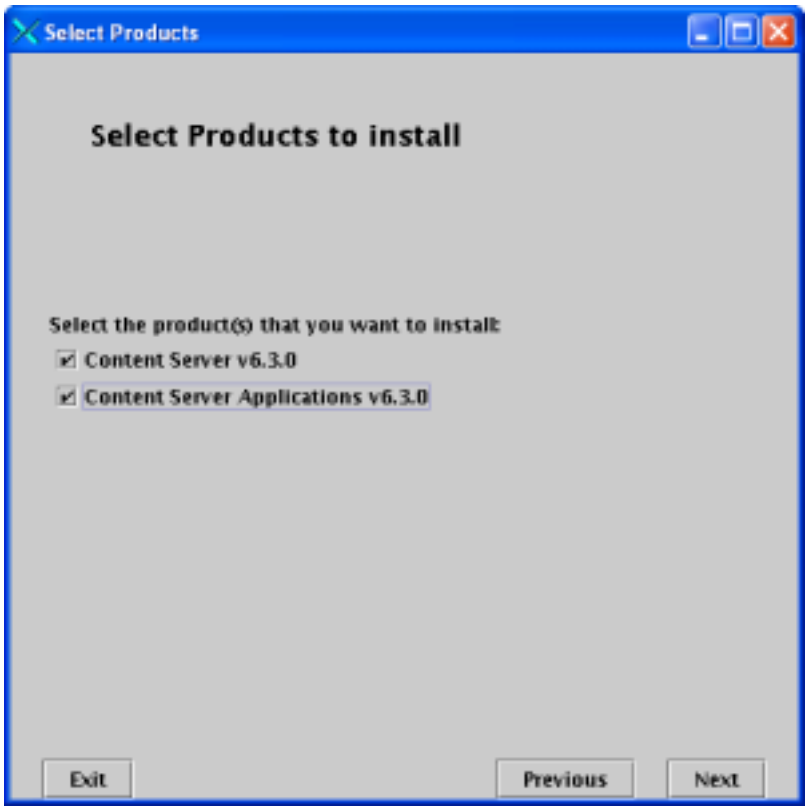
3. Choose the directory in which to install Content Server (the directory that you created in "Pre-Installation Steps") and click **Next**.



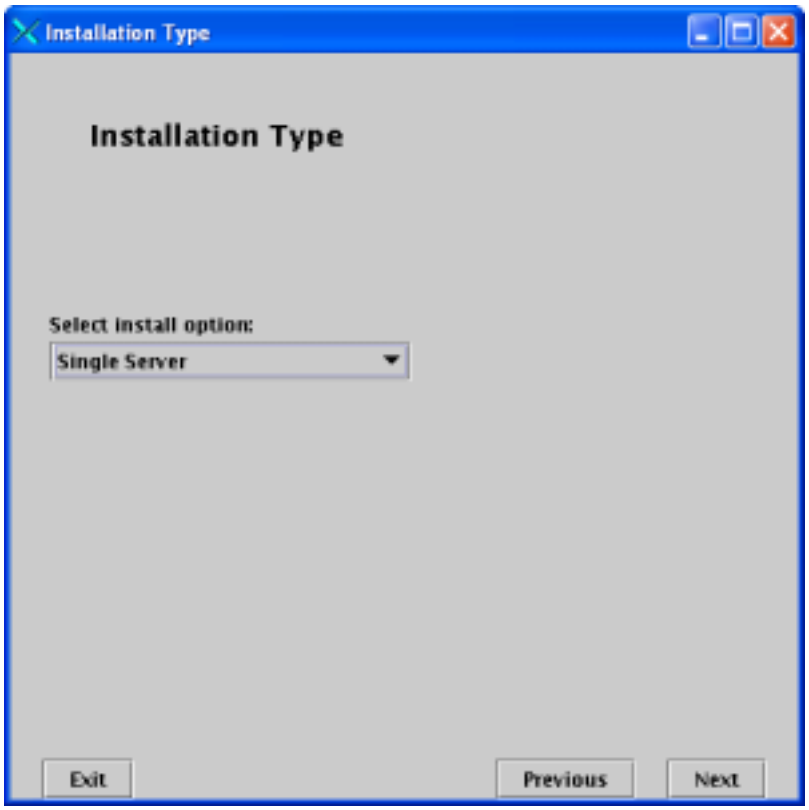
4. Enter the location of the `FWLicense.xml` file, which you received from FatWire and click **Next**.

5. Read the Fatwire License Agreement, select **I accept**, and click **Next**.

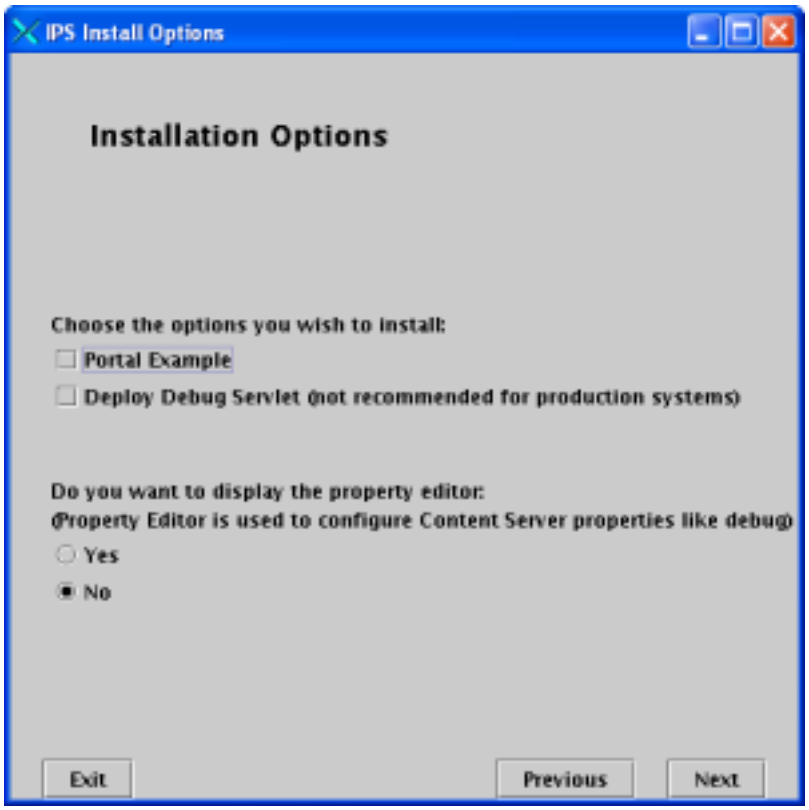
6. Select the products to install and click **Next**.



7. Select an installation type and click **Next**.



8. Select from options according to your installation and click **Next**. (It is recommended to leave the defaults).

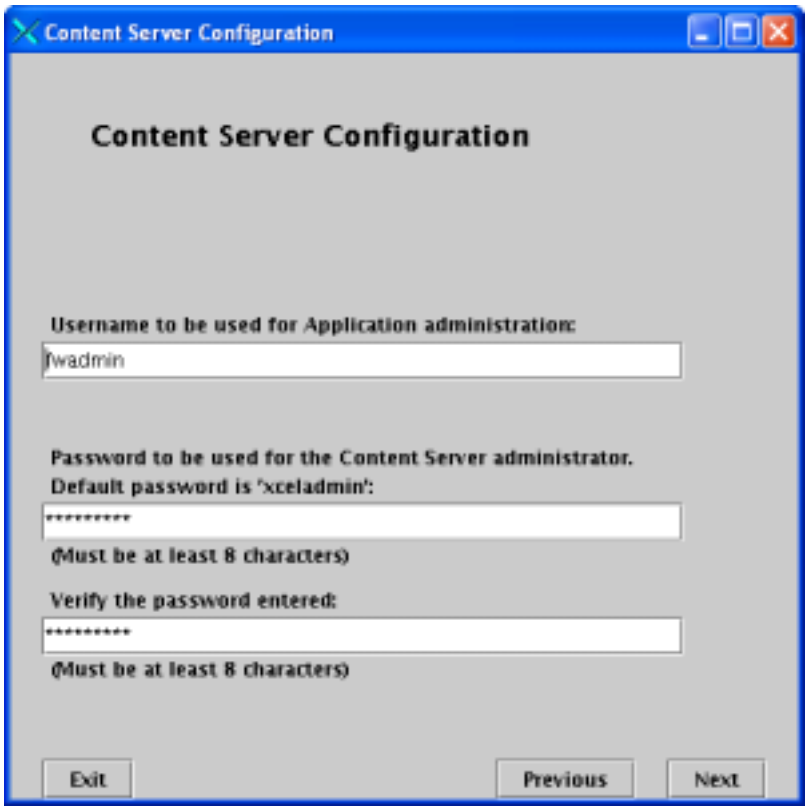


9. Configure a username and password for the Content Server administrator who will be performing installations and upgrades. Click **Next**.

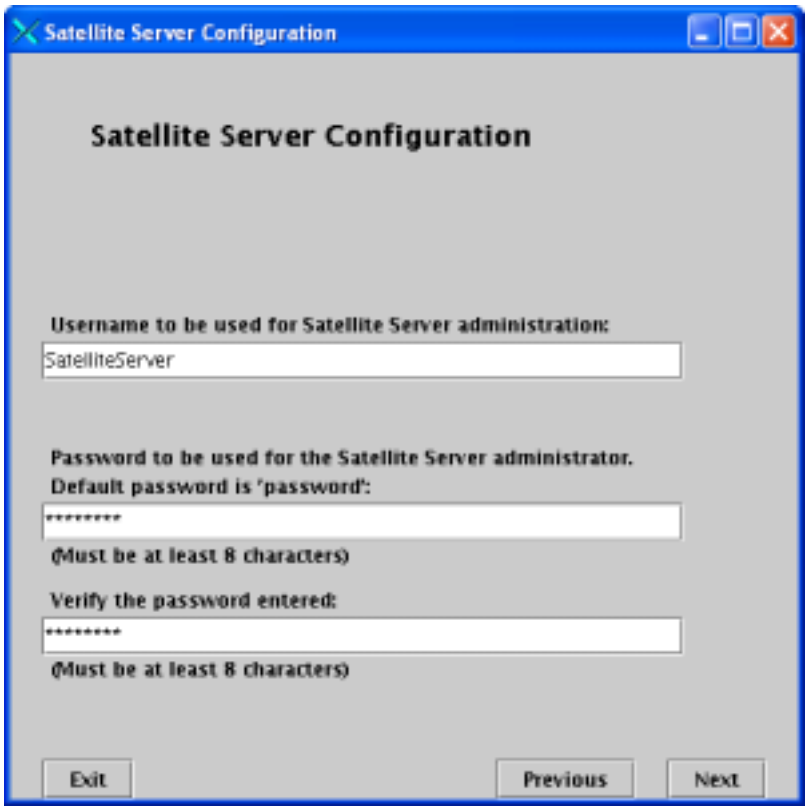
10. Configure a username and password for the Content Server administrator who will be managing the installation, including its sites, users, assets and asset types, publishing functions, and so on.

**Note**

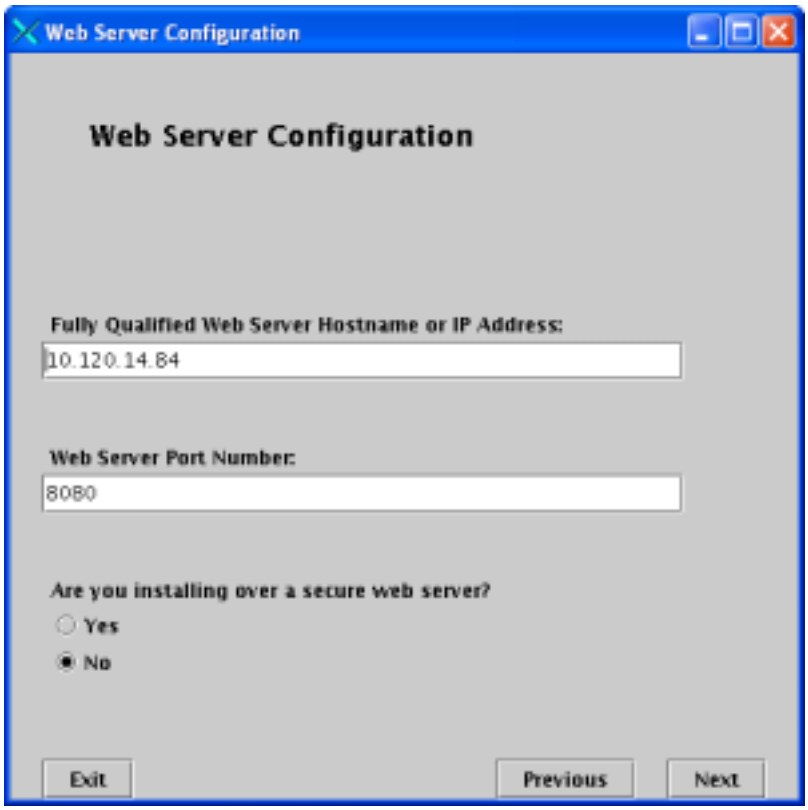
The default username is `fwadmin`. If you wish to specify your own username, specify a name other than `admin`.



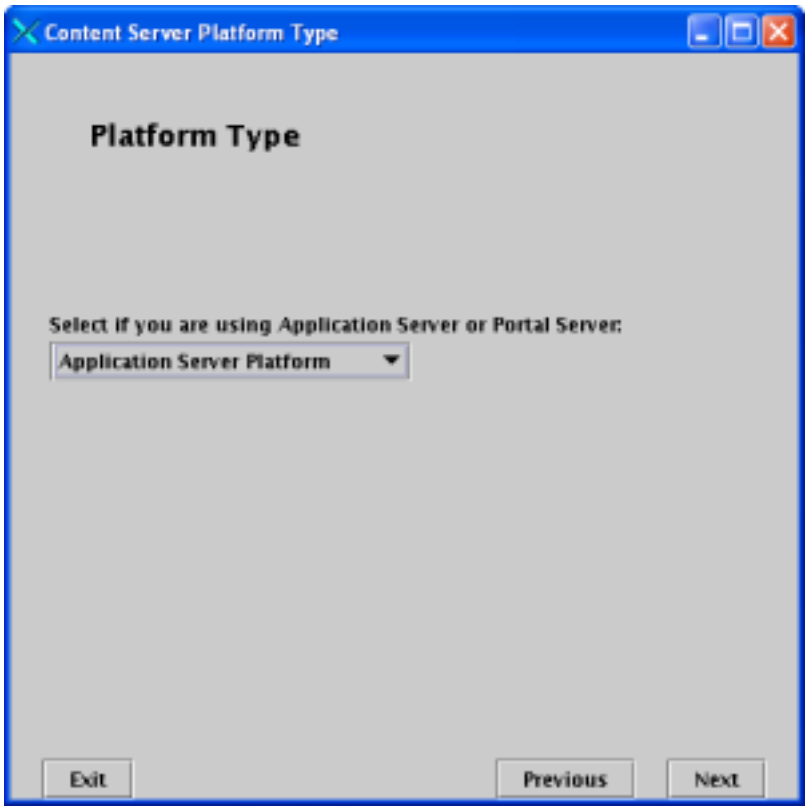
**11.** Configure a username and password for the Satellite Server administrator and click **Next**.



12. Specify the Web Server configuration:
    a. Specify the hostname or IP address of the machine on which to install Content Server.
    b. Specify the port number on which to install Content Server. The port on which JBoss is running is the "web-service port" with possible values listed in "Important Commands and Ports," on page 19.
    c. If you are installing over a secure web server, select **Yes**.
    d. When you are done click **Next**.



**13.** Leave the default selection, which is **Application Server Platform** and click **Next**.

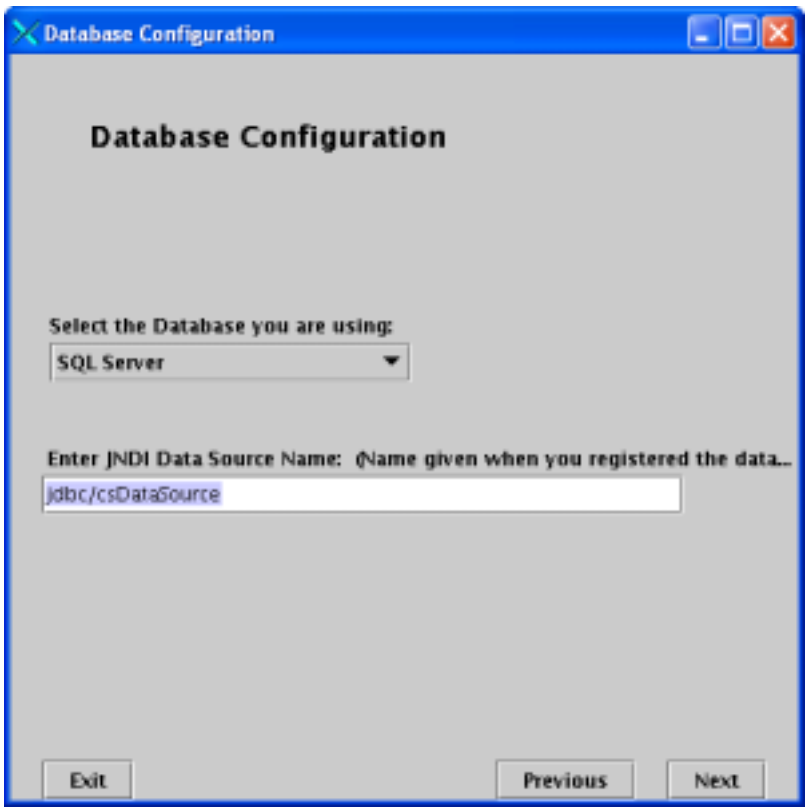


**14.** Select **JBoss App Server** from the pull-down menu and click **Next**.

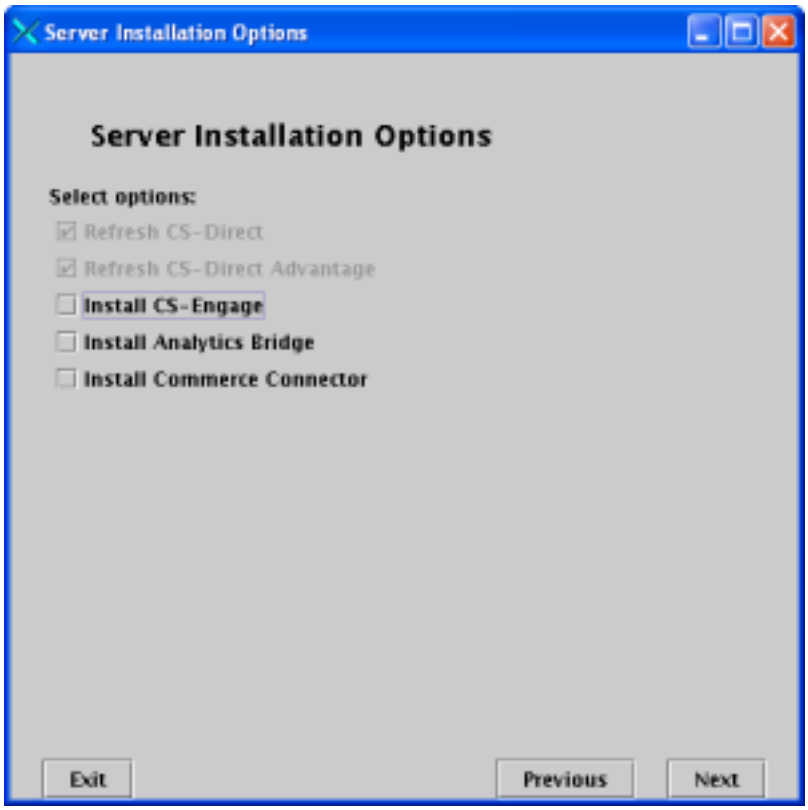
**15.** Specify the JBoss root directory:

- For the Web Application URI enter:
  `/cs/`
- For the JBoss Server Root Directory enter:
  `<path to JBoss install directory>/server/<instance name>`

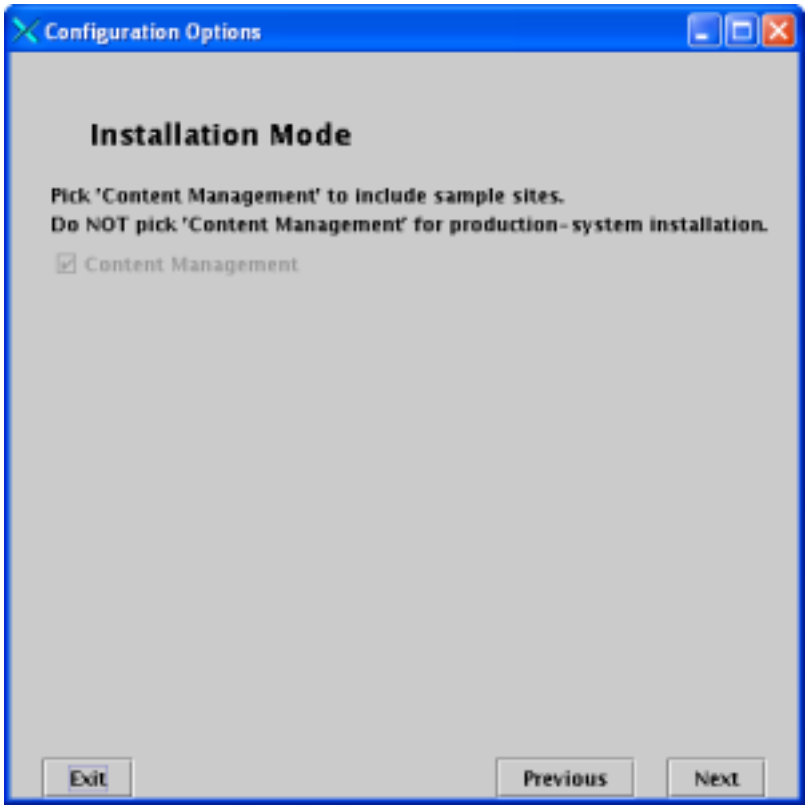
16. From the drop-down menu, select the database that you will use and specify the name of your data source (which can be found in the `jndi` tag in step b of the "Post-Installation Steps," on page 16.) Unless changed, this is `jdbc/csDataSource`. Click **Next** when you are done.



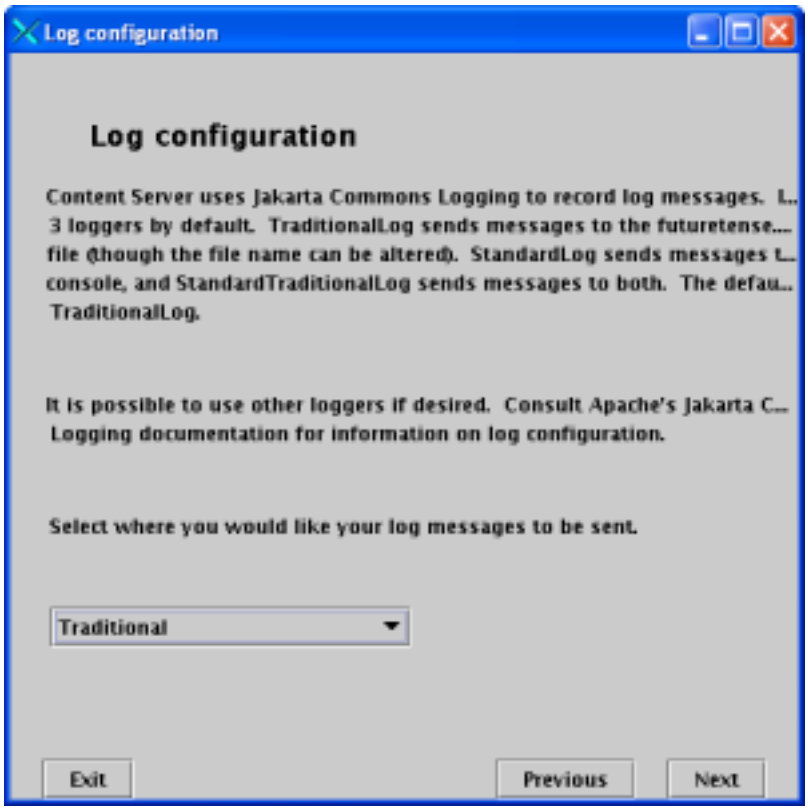
17. Choose the components according to your purchase and click **Next**.



18. Select the installation mode. Do one of the following:
    - Select **Content Management** if you are installing Content Server on either a development or management (staging) system *and* you wish to install sample sites and their assets on the system. (Sample sites and assets will be installed later in the installation process.) Click **Next**.
    - Deselect **Content Management** if you are installing Content Server on a delivery (production) system, or any system where sample sites and assets are unnecessary. (Sample sites and assets will not be installed on this system.) Click **Next**.

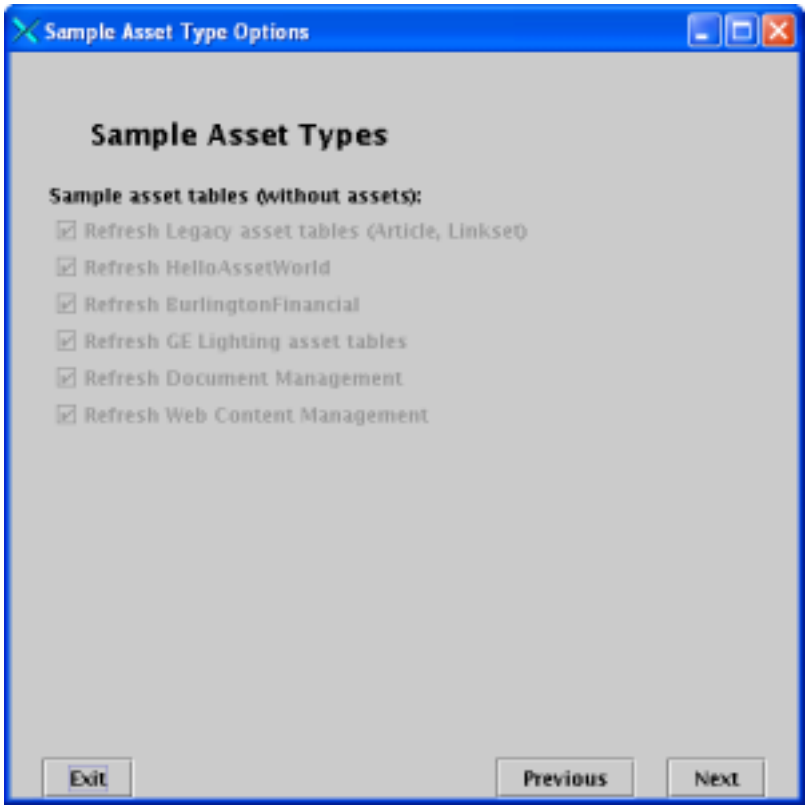


**19.** In the log configuration screen, leave **Traditional** selected and click **Next**.

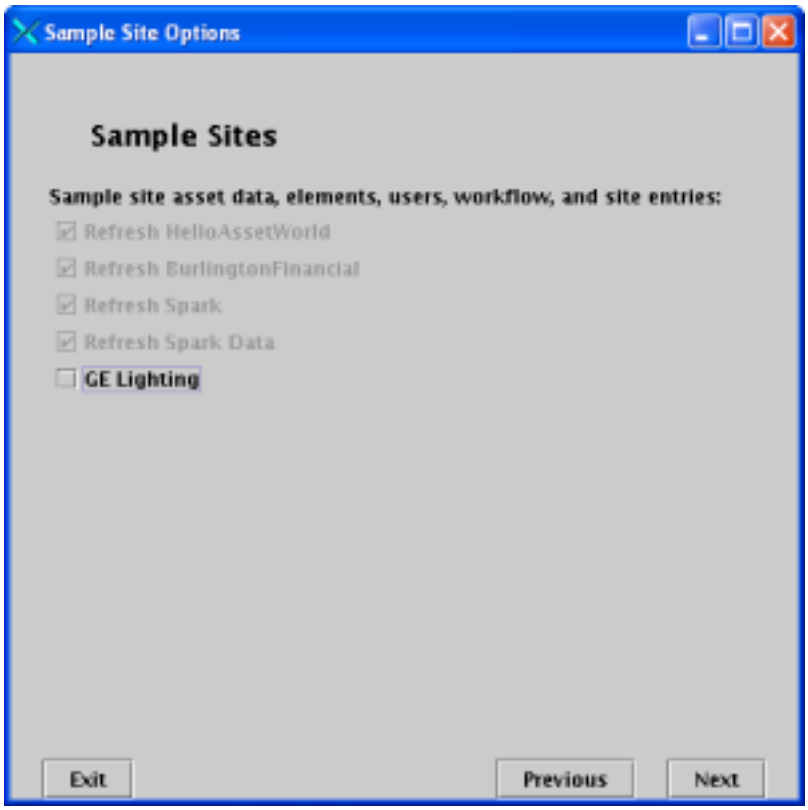


**20.** If you chose a Content Management installation mode, complete the following steps. Otherwise, skip to step 21 on page 55.

**a.** Choose from the sample asset types, then click **Next**.

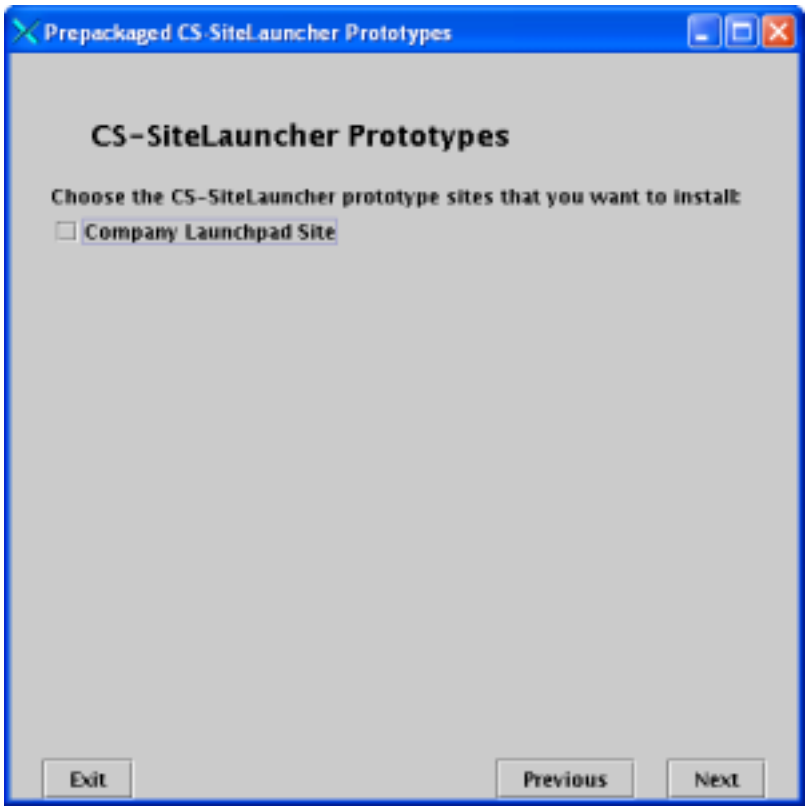


**b.** Choose from the sample sites, then click **Next**.



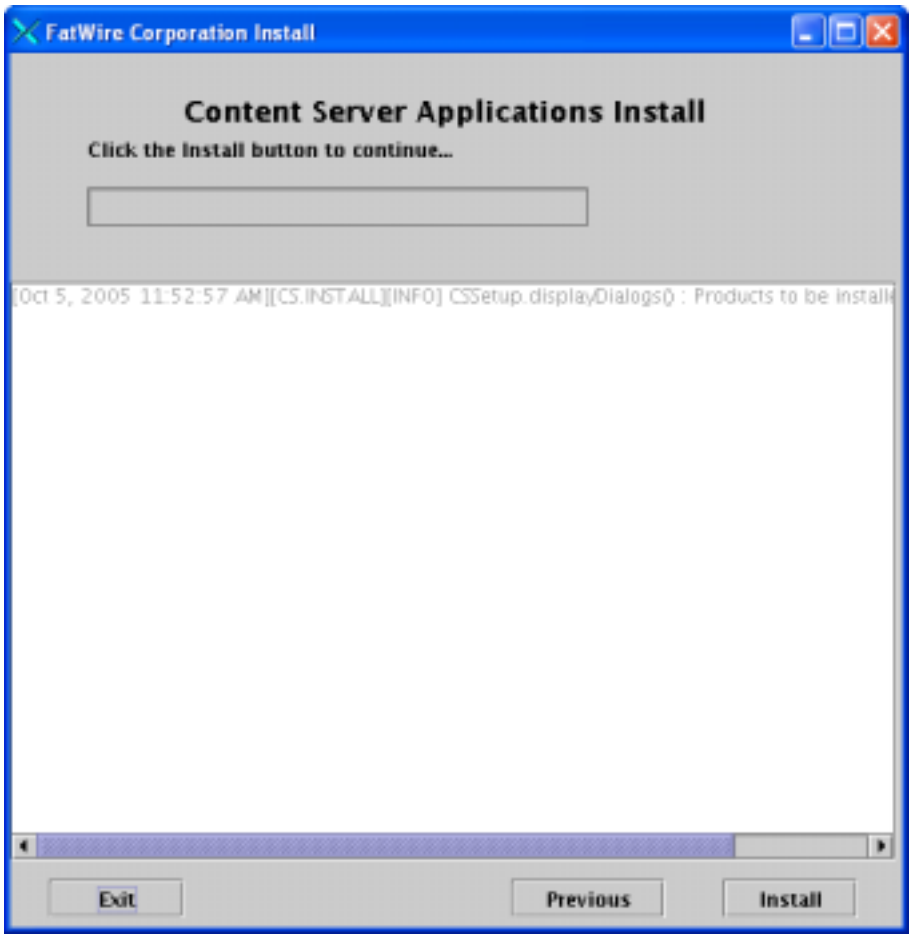
**c.** Choose from the FirstSite II components, then click **Next**.

**d.** Choose the CS-SiteLauncher prototypes (optional), then click **Next**.



**21.** Choose the Property Editors you wish to display (optional), then click **Next**.

**22.** To begin the Content Server Applications installation, click **Install**.



23. When the popup screen appears (halfway through the installation), it means that the Content Server base has been installed. You must now edit `jboss-web.xml` file and restart the server.

    a. Using a text editor, open the `jboss-web.xml` file located at `<path to JBoss install directory>/server/<instance name>/deploy/cs.war/WEB-INF/jboss-web.xml`.

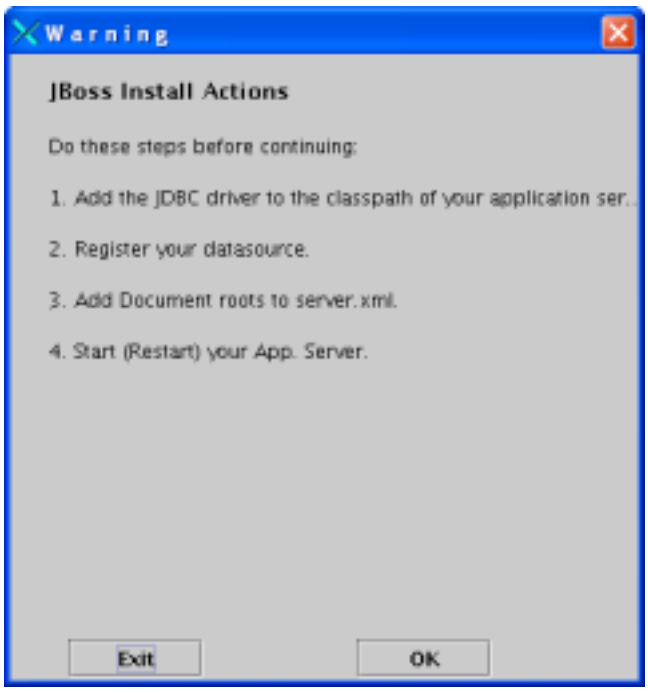
    b. Make sure that both the tags `<res-ref-name>` tag and `<jndi-name>` have either `jdbc/csDataSource` as their values or the value of the `<jndi-name>` tag in the data source file (`<database type>-ds.xml`).

    c. Shut down and restart the server using the following commands:

    **<path to JBoss install directory>/bin/shutdown.sh –s jnp://<hostname>:<jnp port>**

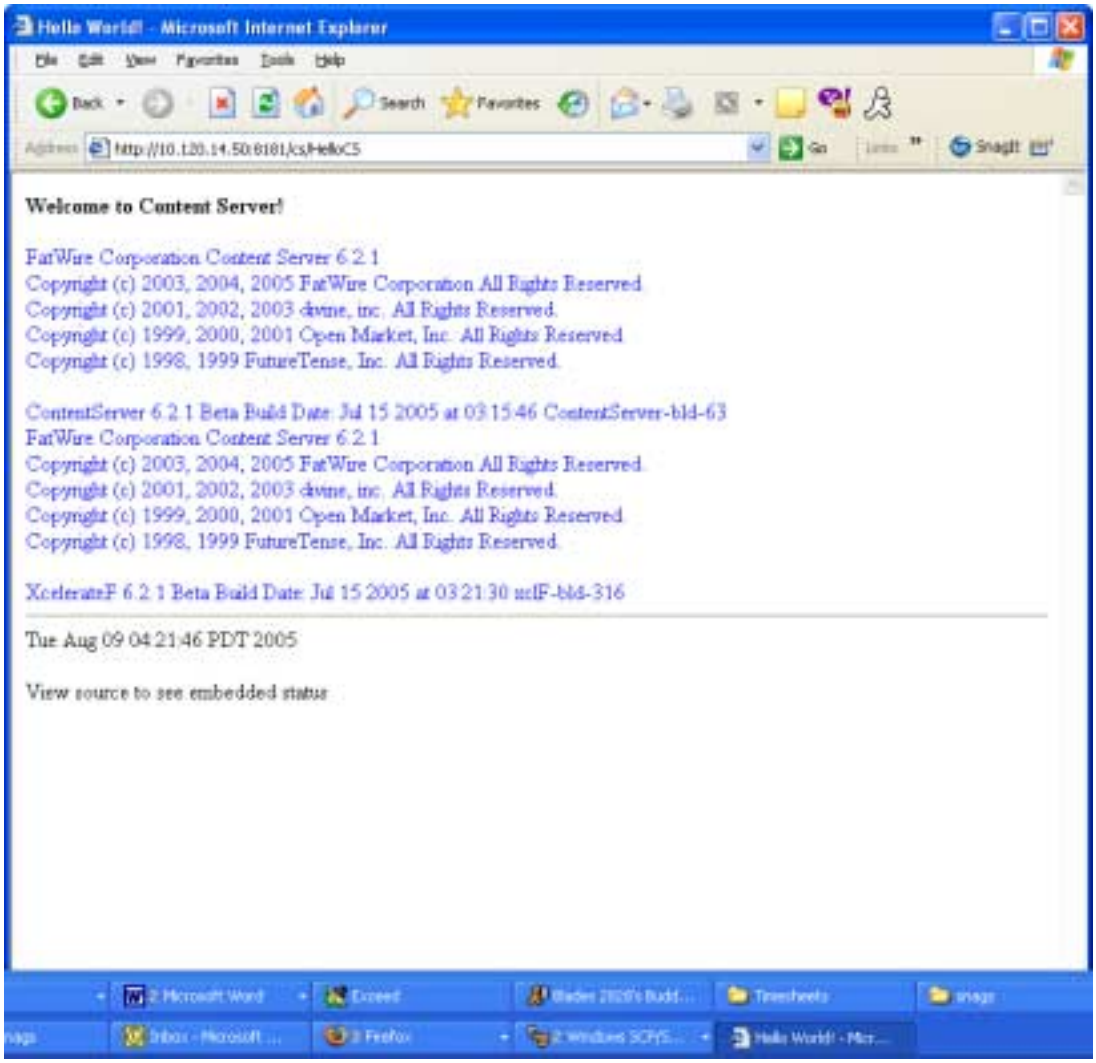
    **<path to JBoss install directory>/bin/run.sh –c <instance name>**

    d. Click **OK.**



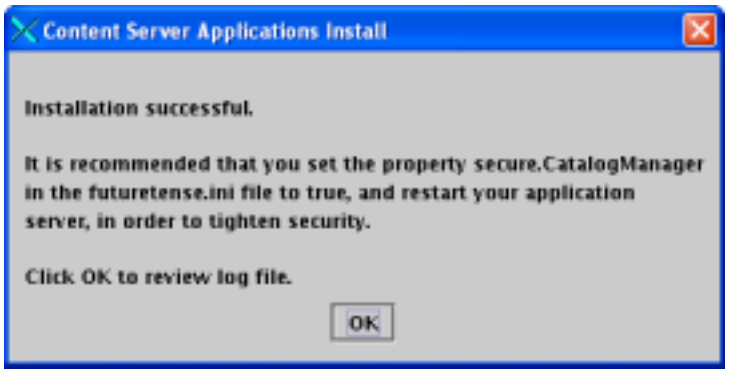
**e.** After the application server restarts, test that the application is working and can connect to the database:

**1)** `http://<hostname>:<port>/cs/HelloCS`



**2)** `http://<hostname>:<port>/cs/Cataloganager?ftcmd=pingdb`
This will test if Content Server can connect to the database.

24. When the final popup is displayed stating the installation is successful, click **OK** to close the popup then click **Exit** to close the Content Server installation window.




# Installing Content Server in a Clustered Environment

This section is written on the assumption that you have already installed and configured JBoss Application Server as specified in the previous sections of this guide (this means that you have installed and configured a single instance of Content Server to run through JBoss, and have logged in and confirmed that it is operational).

It is also assumed that you are installing a vertical cluster (JBoss Application Server instances are installed on the same machine).

1. Create a new JBoss instance and Content Server installation directory by following the steps in "Post-Installation Steps," on page 16.
2. Change the port settings of the new instance by following the steps in "Running Multiple Instances of JBoss Simultaneously," on page 18.
3. Repeat the installation steps in "Install Content Server," on page 32. Perform the steps exactly as you had in that procedure, with the exception of the following changes:
   a. In the "Installation Directory" screen (see step 3 on page 34), select the directory that you created in step 1 of this section.
   b. In the "Installation Type" screen (see step 7 on page 38), select **Cluster Member.**
   c. Select the Shared Directory Root, which defaults to `<path to previous Content Server Directory Root>/Shared`.
   d. In the "Web Server Configuration" screen (see step 12 on page 43), use the IP address and port of the server created in step 2 of this section.
   e. In the "JBoss Root Directory" screen (see step 15 on page 46), use the path to the root directory created in step 1 of this section.

4. For all members of the cluster, edit the `web.xml file` for Content Server so JBoss will add them to the cluster. Open `<path to JBoss install directory>/server/<instance name>/deploy/cs.war/WEB-INF/web.xml` in a text editor, and add the line

   ```
   <web-app>
        <distributable/>
        <servlet>
   ```

5. Make sure there is a `usedisksync` directory in the Shared directory of your primary CS installation, or the first one that was created. If this directory is not already there, then create it with the following command:

   **`mkdir <path to CS install directory>/Shared/usedisksync`**

6. To finalize the clustering process, you must edit the following properties using the Property Editor (this must be done for all cluster members).
   - `<path to CS install directory>/propeditor.sh`
     (your display variable must be set)
   - When the interface is displayed, click **File**, **Open…,** and open the `futuretense.ini file` in your Content Server installation directory.
   - Click **Cluster**. Three variable should be displayed under **Items**:
     - `cc.cacheNoSync` should have a value of “false”.
     - `ft.sync` should have a value assigned by you to all members of this cluster.
       **`Ex:`** `cluster1.`
     - `ft.usedisksync` should be set to the path of the `usedisksync` directory created in step 5.

## Load Balancing with mod_jk

**Note**

To complete this section, you must have installed JBoss Application Server with a Content Server cluster. If you have not already done so, complete the steps in “Integrating JBoss with Apache 2.0.x,” on page 24.”

1. In step 7 on page 24, make sure the `workers.properties` in `$APACHE2_HOME/conf` has the following content:

   ```
   ps=\

   worker.list=node1, node2, loadbalancer

   worker.node1.port=<ajp port1>
   worker.node1.host=<hostname>
   worker.node1.type=ajp13
   worker.node1.lbfactor=1
   worker.node1.cachesize=1

   worker.node2.port=<ajp port2>
   worker.node2.host=<hostname>
   ```

```
worker.node2.type=ajp13
worker.node2.lbfactor=1
worker.node2.cachesize=1

worker.loadbalancer.type=lb
worker.loadbalancer.balanced_workers=node1,node2

/cs/*=loadbalancer
```

**Note**

This configuration supports two cluster members and one load balancer. For each additional cluster member, add the member name to the `worker.list`, `worker.loadbalancer.balanced_workers`, and add the following lines:

```
worker.<member name>.port=<ajp port>
worker.<member name>.host=<hostname>
worker.<member name>.type=ajp13
worker.<member name>.lbfactor=1
worker.node1.cachesize=1
```

2. In step 8 on page 25, edit line `JkMount /cs/* jboss` to read : `JkMount /cs/* loadbalancer`
3. You have now completed the load balancer configuration. Restart Apache for the changes to take effect.

# Post Installation Steps

1. Copy the `libFTFilelock`.so to a location in the library path (usually `/usr/local/lib`).

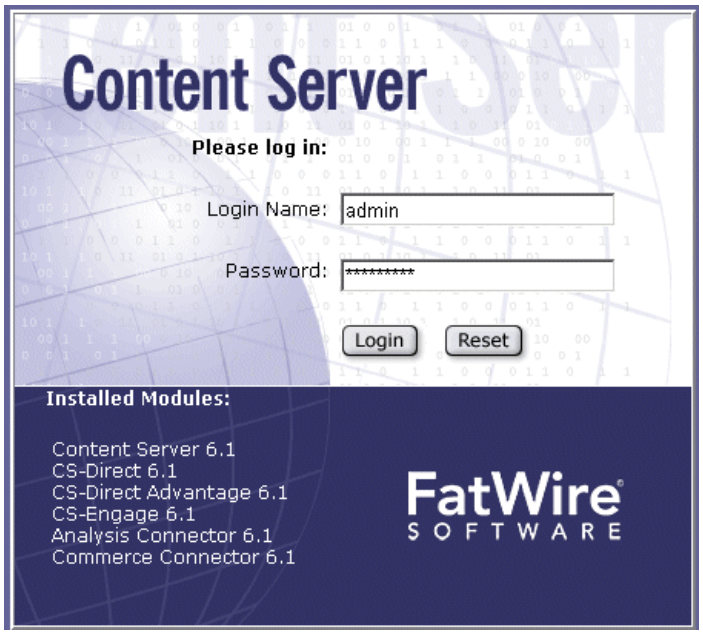
   ```
   cp <path to CS install directory>/bin/libFTFilelock.so /usr/local/lib
   ```

2. Log in to the administration page:

   URL: `http://<hostname>:<port>/cs/Xcelerate/LoginPage.html`

   Login: fwadmin

   Password: xceladmin



# Installing Verity Search Engine

> **Note**
>
> Installing the search engine is optional.

1. Install the Verity search engine, using the Verity installer provided by FatWire.
2. Copy the following two files to `<path to CS install directory>/bin`:
   - `<path to CS install directory>/binLinux/libFTVeritySearch`.so
   - `libvdk30`.so

   (This is done as JBoss has no location for OS-specific shared objects.)

   **For Linux only,** add the paths:
   - `<path to CS install directory>/bin`
   - `<path to CS install directory>/VerityK2/_ilnx21/bin`
   - `<path to CS install directory>/VerityK2/_ilnx21/filters` to `/etc/ld.so.conf` and run `ldconfig` (as root)
3. Edit the `run.sh` file for JBoss and at the beginning of the file, after the script is described, add:

   ```
   LD_LIBRARY_PATH=<path to CS install directory>/VerityK2/
      _ilnx21/bin:<cs install>/VerityK2/_ilnx21/filters: <path to
      CS install directory>/bin:$LD_LIBRARY_PATH

   export LD_LIBRARY_PATH

   PATH=$PATH:<path to CS install directory>/VerityK2/_ilnx21/
      bin:<path to CS install directory>/bin

   export PATH
   ```
4. Edit the `<path to CS install directory>/futuretense_xcel.ini` by setting the following properties as shown:

   ```
   xcelerate.usese=true
   xcelerate.sePath=<path to CS install directory>/Shared sedb
   ```
5. Issue the command: **mkdir <path to CS install directory>/Shared/sedb**