LogicBlaze FUSE Getting Started Guide

The Open Source SOA Platform

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This document is a quick-start guide to running and using the LogicBlaze FUSE distribution. The document includes instructions for installing and configuring LogicBlaze FUSE for both Unix and Windows' platforms. Then it explains how to run and stop LogicBlaze FUSE.

Contents

1. Installation Requirements

Hardware:
- 90 MB - 144 MB of free disk space for the automatic installers, depending on the operating system.
- 100 MB of free disk space for the LogicBlaze FUSE 1.x distribution.

Operating Systems:
- Windows: Windows XP, Windows 2003.
- Unix: RedHat Linux, Fedora 4 and 5, and Mac OS X.

Environment:
- Java Developer Kit (JDK) 1.5.x or greater.
- The `JAVA_HOME environment` variable must be set to the directory where the JDK is installed; for example, `c:\Program Files\jsdk.1.5_05`.
- Maven 2.0.4 is required when installing source or developers' releases, and when building the demos using the binary release.
- MySQL 5.0 is required if you want to migrate to a MySQL database.

2. Downloading LogicBlaze FUSE

1. From a browser, navigate to http://www.logicblaze.com and click on the "Products" link at the top of the page.
2. Click on the "Download FUSE" link and follow the instructions on the web page.
3. Upon successful completion of step 2 you will be sent an email with a variety of links to files available for download. Please continue to the *Choosing Your Installation File* section of this documentation so that you may chose the link that best serves your needs.
4. After selecting your installation please proceed to the installation portion of the document that corresponds to the type of installation you selected.

2.1. Choosing Your Installation File

When installing LogicBlaze FUSE it is important to choose the right download file for your operating system. This section will help you choose the right file.

> You may also choose to download a distribution or an installer. An installer will download both the distribution and an automatic installer for you.

2.2. Binary and Source Distributions

When downloading a distribution you may choose to download the source code or download a binary version. Source code downloads are denoted with the letters "`src`" in the file name. Source files must be built using a build tool (such as Maven). All files are in ZIP format so please choose a compression that you can open, for example "`.gz`" files for UNIX systems, "`.zip`" files for Windows systems..

Binary and source distributions are available with Apache Derby database. You have the option to use and migrate to MySQL 5.0 database. If you need additional information on these two databases please review the links in the Additional Resources section.

> When you download a binary distribution, it is up to you to manually unzip it and place it in a directory of your choice, unlike using an automatic installer, which does this for you automatically.

2.3. Installers

Installers provide you with a guided step by step setup automated installation of LogicBlaze FUSE. Each installer file has the name of the environment (`mac`, `win`, etc.) in its name. Please select the environment that corresponds to your machine. There is a graphical user interface (GUI) version and a console or command line version (text only).

To designate a console installation please choose the file with "`console`" in its name, otherwise you will have selected the UI version. If you do not have Java 1.5 on your machine and would like that to be part of your download please select the file with the text "`vm`" (virtual machine). You may choose to download Java 1.5 from another source. The virtual machine option is only for Linux and windows.

WebSphere Application Server Community Edition (WAS-CE), a Java 2 Enterprise Edition (J2EE) server compatible with V1.4 of the J2EE specification is also available with FUSE. WAS-CE is only available via an automatic installer and it comes with Apache Derby. WAS-CE downloads are specified with "WASCE" in the file name. Please review the LogicBlaze FUSE "Integration Guide for LogicBlaze FUSE and WAS CE" documentation for more information.

Installers are available with an Apache Derby database.

2.4. Packages Available

Please visit http://www.logicblaze.com to download packages.

LogicBlaze FUSE Binary Packages

Binary with installer for Mac OSX

- `FUSE-1.x_mac.zip` (90 MB) - Macintosh graphic user interfaced installer
- `FUSE-WASCE_mac.zip` (79 MB) - Macintosh graphic user interfaced installer for LogicBlaze FUSE integrated with WebSphere Application Server Community Edition

Binary with installer for Windows

- `FUSE-1.x_win.exe` (90 MB) - Windows graphic user interfaced installer
- `FUSE-1.x_vm_win.exe` (116 MB) - Windows graphic user interfaced installer with Java Virtual Machine
- `FUSE-WASCE_win.exe` (79 MB) - Windows graphic user interfaced installer for LogicBlaze FUSE integrated with WebSphere Application Server Community Edition

Binary with installer for Linux

- `FUSE-1.x_linux.bin` (90 MB) - Linux graphic user interfaced installer
- `FUSE-1-x_linux_console.bin` (90 MB) - Linux console based installer
- `FUSE-1.x_vm_linux.bin` (142 MB) - Linux graphic user interfaced installer with Java Virtual Machine
- `FUSE-1.x_vm_linux_console.bin` (141 MB) - Linux console based installer with Java Virtual Machine
- `FUSEWASCE_linux.bin` (88 MB) - Linux graphic user interfaced installer for LogicBlaze FUSE integrated with WebSphere Application Server Community Edition
- `FUSEWASCE_linux_console.bin` (88 MB) - Linux console based installer for LogicBlaze FUSE integrated with WebSphere Application Server Community Edition

LogicBlaze FUSE Source Package

- `FUSE-1.x_src.zip` (6 MB) - Source installation zipped for Windows
- `FUSE-1.x_src.tar.gz` (6 MB) - Source installation zipped for UNIX

LogicBlaze FUSE Documentation

- `FUSE-1.x_Documentation.zip` (3 MB) - Complete updated FUSE documentation set

2.5. Limitations on Packages

Macintosh:

- Mac is a UI based installer which was tested in MacOSX 10.4.5. It doesn't have a `vm` installer and the user will have to install at least a jdk1.5 in order for FUSE to work.
- When installing on a Mac, double clicking the fuse script in the `bin` directory doesn't work. The user will have to start FUSE in the console; for example, `../bin:>./fuse`.

Linux:

- When executing a `linux_vm` installer, the user will need to re-login in order for the `JAVA_HOME` environment variable to take effect.

3. Using an Automatic Installer

LogicBlaze FUSE can be installed using an automatic installer. The InstallAnywhere automatic installer will download and install a binary distribution of LogicBlaze FUSE for you. The following instructions apply for both UNIX and Windows installation. If you are installing on a UNIX server with no console, go to section 3.1.

1. From a browser, navigate to http://www.logicblaze.com and click on the "Products" link at the top of the page.

2. Click on the "Download FUSE" link and follow the instructions on the web page. You will receive an email with a list of files available for download.

3. Select the appropriate installer for your operating system. If you need help choosing an installer please refer to the Choosing Your Installation File section of this documentation.

4. Follow the prompts in the pop-up window to either Save or Open the installer.

5. After the download completes, click the Run button in the pop-up window. Then follow the prompts in the InstallAnywhere window.

> Make note of the directory in which you install LogicBlaze FUSE. This information will be necessary for starting LogicBlaze FUSE. Keep the pathname of the installation directory short, long pathnames could cause an error when running FUSE.

6. From a GUI interface you have the option to click on the FUSE icon that was installed during this installation. Alternatively you may chose to follow the Starting LogicBlaze FUSE section of this document.

7. Following start-up, go to the Testing the Installation section of this document.

3.1. Headless UNIX Server with an Automatic Installer

If you are installing on a UNIX server without a console follow these instructions. These instructions assume you are using a Windows desktop running an XServer.

1. From a browser on your *Windows* machine, navigate to http://www.logicblaze.com and click on the "Products" link at the top of the page.

2. Click on the "Download FUSE" link and follow the instructions on the web page. You will receive an email with a list of files available for download.

3. Select the appropriate installer for your operating system. You may choose to use a console or UI mode installer. The installations are exactly the same with the exception of the interface. Please see the Choosing Your Installation File section for more information. Right click on the link and save or copy the link (for example, Copy Shortcut). You will use this saved shortcut in the next step.

4. Download the distribution to the *UNIX* machine using the `wget` tool. For example, from a shell on the UNIX machine type `wget` followed by the saved shortcut on your UNIX machine:

```
wget http://www.logicblaze.com/common/register/download?domain=lb&asset=FUSE-
1.0_vm_win.exe&guid=96DE2D3F-3444-7ADC-7226-C0BACDB424AF
```

5.   Change to the directory in which LogicBlaze FUSE will be installed, for example, `/usr/local`.

6.   If the files are in ZIP format, extract them from the `gzip` file into a directory of your choice. For example:

```
gunzip FUSE-x.x_x.tar.gz
tar xvf FUSE-x.x_.tar
```

OR

```
tar xvfz FUSE-x.x_x.tar.gz
```

7.   On your Windows system, start the XServer, if it is not already running. The operation of the XServer client is beyond the scope of this document. Please refer to your XServer documentation for more information.

8.   Set your `DISPLAY` environment variable to your Windows desktop. This step may or may not be needed based on your chosen environment. For example:

In the BASH shell:

```
DISPLAY=<ipaddress>;export DISPLAY
```

9.   If the fuse start-up script is not executable, change its permissions. For example:

```
chmod 755 FUSE-x.x_linux.bin
```

OR

```
chmod +x FUSE-x.x_linux.bin
```

10. Run this installer using the following command. For example:

```
[fuse_dir]/FUSE-x.x_linux.bin
```

This command opens the InstallAnywhere window. Please follow the InstallAnywhere prompts answering the questions as they best fit your needs.

Make note of the directory in which you install LogicBlaze FUSE. This information will be necessary for starting LogicBlaze FUSE. Keep the pathname of the installation directory short, long pathnames could cause an error when running FUSE.

11. Proceed to the Starting LogicBlaze FUSE section of this document.

12. Following start-up, go to the Testing the Installation section of this document.

4. Manual Installation

The following sections discuss how to install LogicBlaze FUSE without using an automatic installer on Windows and UNIX platforms.

> For all manual installations, make note of the directory in which you install LogicBlaze FUSE. This information will be necessary for starting LogicBlaze FUSE. Also, keep the pathname of the installation directory short, long pathnames could cause an error when running FUSE.

4.1. Windows Binary Installation

1. From a browser, navigate to http://www.logicblaze.com and click on the "Products" link at the top of the page.
2. Click on the "Download FUSE" link and follow the instructions on the web page. You will receive an email with a list of files available for download.
3. Select the desired distribution. If you need help choosing an installer please refer to the Choosing Your Installation File section of this documentation. For a Windows binary distribution, the filename will be similar to: `FUSE-x.x_.zip`.
4. Extract the files from the ZIP file into a directory of your choice.
5. Proceed to the Starting LogicBlaze FUSE section of this document.
6. Following start-up, go to the Testing the Installation section of this document.

4.2. Windows Source Installation

1. From a browser, navigate to http://www.logicblaze.com and click on the "Products" link at the top of the page.
2. Click on the "Download FUSE" link and follow the instructions on the web page. You will receive an email with a list of files available for download.
3. Select the desired distribution. If you need help choosing an installer please refer to the Choosing Your Installation File section of this documentation. For a source distribution, the filename will be similar to: `FUSE-x.x_src.zip`.
4. Extract LogicBlaze FUSE from the ZIP file into a directory of your choice.
5. Build LogicBlaze FUSE using Maven 2.0.4 and Java 5. The recommended method of building LogicBlaze FUSE is the following:

   ```
   cd [fuse_dir]
   mvn install
   ```

   where `[fuse_dir]` is the directory in which LogicBlaze FUSE was installed.

   If the build in the above step fails on some tests, type the following:

   ```
   mvn install -Dmaven.test.skip=true
   ```

6. Go to the `target` directory and extract the ZIP file within, for example:

```
[fuse_dir]\target\fuse-x.x.zip
```

7. Start LogicBlaze FUSE from the `bin` directory that was extracted within the `target` directory, for example:

```
cd [fuse_dir]\target\fuse-x.x\fuse-x.x
java -jar fuse.jar
```

OR

```
bin\fuse
```

Or add the `bin` directory to your path and execute the batch file by typing: `fuse`.

8. Proceed to the Testing the Installation section.

4.3. Windows Developers' Release

1. From a browser, navigate to http://www.logicblaze.com and click on the "Products" link at the top of the page.

2. Click on the "Download FUSE" link and follow the instructions on the web page.

3. You will receive an email with a list of files available for download. If you need help choosing an installer please refer to the Choosing Your Installation File section of this documentation.

4. Select the version of LogicBlaze FUSE to download (if necessary, scroll down to see the snapshots).

5. Extract the files from the ZIP file into a directory of your choice.

6. If a binary snapshot was downloaded proceed to the Starting LogicBlaze FUSE section of this document. If a source snapshot was downloaded perform steps 5 to 7 of the Windows Source Installation procedure.

7. Following start-up, proceed to the Testing the Installation section.

4.4. Unix Binary Installation

This procedure explains how to download and install the binary distribution on a Unix system.

1. Download the LogicBlaze `gzip` file to the Unix machine, either using a browser or using a tool, such as `wget`, `scp`, `ftp`, etc.

2. **If the Unix machine has a browser**:

    a. Navigate to http://www.logicblaze.com and click the Download link.

    b. Select the desired distribution for a binary Unix distribution, the filename will be similar to: fuse-`x.x.tar.gz`.

3. **If the Unix machine does NOT have a browser**, tools such as `wget`, `scp,` or `ftp` can be used to download the distribution.

    It is beyond the scope of this document to explain the use of those tools. For convenience an example is provided below using a Windows machine (that has a browser) and a Unix machine with "`wget`" installed on it.

There are several alternative ways to perform this type of installation.

a. From a browser, navigate to http://www.logicblaze.com and click on the "Products" link at the top of the page.

b. Click on the "Download FUSE" link and follow the instructions on the web page.

You will receive an email with a list of files available for download. Select the desired distribution. If you need help choosing an installer please refer to the Choosing Your Installation File section of this documentation.

c. Roll-over the desired distribution. For a binary Unix distribution the filename will be similar to: `fuse-x.x.tar.gz` or `fuse-x.x.tar.gz`.

d. Right-click on the distribution name and "Copy Shortcut."

e. Back on the Unix machine, change to the directory in which LogicBlaze FUSE will be installed, for example, `/usr/local`.

Download the distribution to the Unix machine using the `wget` tool. For example, type `wget` followed by the saved shortcut:

```
wget http://hostname.com/repository/logicblaze/distributions/fuse-
1.x.tar.gz
```

4. Extract the files from the gzip file into a directory of your choice. For example:

```
gunzip fuse-x.x.tar.gz
tar xvf fuse-x.x.tar
```
   OR (in one command)
```
tar xvfz fuse-x.x.tar.gz
```

5. If the fuse start-up script is not executable, change its permissions. The fuse script is located in the `bin` directory. For example:

```
cd [fuse_dir]/bin
chmod 755 fuse
```

where `[fuse_dir]` is the directory in which LogicBlaze FUSE was installed.

6. Proceed to the Starting LogicBlaze FUSE section of this document.

7. Following start-up, go to the Testing the Installation section.

4.5. Unix Source Installation

This procedure explains how to download and install the source distribution on a Unix system. This procedure assumes the Unix machine has a browser.

Java 5 is required to compile/build LogicBlaze FUSE.

1. From a browser, navigate to http://www.logicblaze.com and click on the "Products" link at the top of the page.

2. Click on the "Download FUSE" link and follow the instructions on the web page.

You will receive an email with a list of files available for download. Select the desired distribution. If you need help choosing an installer please refer to the Choosing Your Installation File section of this documentation.

3. Select the desired distribution. For a source distribution, the filename will be similar to:

    ```
    fuse-x.x-src.tar.gz.
    ```

4. Extract the files from the ZIP file into a directory of your choice, for example:

    ```
    gunzip FUSE-x.x-src.tar.gz
    tar xvf FUSE-x.x-src.tar
    ```

5. Build LogicBlaze FUSE using Maven 2.0.4 and Java 5. The preferred method of building LogicBlaze FUSE is the following:

    ```
    cd [fuse_dir]
    mvn install
    ```

    If the build in the above step fails on some tests, type the following:

    ```
    mvn install -Dmaven.test.skip=true
    ```

    where [fuse_dir] is the directory in which LogicBlaze FUSE was installed.

6. Go to the `target` directory and extract the ZIP file within, for example:

    ```
    gunzip [fuse_dir]/target/fuse-x.x.tar.gz
    ```

7. The start-up script is located in the `bin` directory that was extracted. If the fuse start-up script is not executable, change its permissions. For example:

    ```
    cd [fuse_dir]/target/fuse-x.x/fuse-x.x/bin
    chmod 755 fuse
    ```

8. Start LogicBlaze FUSE from the `target` directory, for example:

    ```
    cd [fuse_dir]/target/fuse-x.x/fuse-x.x
    bin/fuse
    ```

    Working directories get created relative to the current directory. For the working directories to be created in the proper place, LogicBlaze FUSE must be launched from the directory in which it was installed.

9. Proceed to Testing the Installation section.

4.6. Unix Developers' Release

This procedure explains how to download and install the latest developers' snapshot.

1. From a browser, navigate to http://www.logicblaze.com and click on the "Products" link at the top of the page.

2. Click on the "Download FUSE" link and follow the instructions on the web page. You will receive an email with a list of files available for download.

3. Select the desired distribution. If you need help choosing an installer please refer to the Choosing Your Installation File section of this documentation. The filename will be similar to:
    fuse-x.x-src.tar.gz.

4. Extract the files from the `gzip` file into a directory of your choice. For example:

```
gunzip fuse-x.x-src.tar.gz
tar xvf fuse-x.x-src.tar
```

OR

```
tar xvfz fuse-x.x-src.tar
```

5. If a binary snapshot was downloaded the fuse script may need its permissions changed to make it executable:

```
cd [fuse_dir]/bin
chmod 755 fuse
```

where `[fuse_dir]` is the directory in which LogicBlaze FUSE was installed.

For a binary snapshot, proceed to the Starting LogicBlaze FUSE section of this document. If a source snapshot was downloaded perform steps 5 - 8 of the Unix Source Installation procedure.

6. Proceed to the Testing the Installation section.

5. Starting LogicBlaze FUSE

The following discusses how to run LogicBlaze FUSE from a command shell from Windows or Unix.

5.1. Windows

To run LogicBlaze FUSE:

Java 5 must be installed and the JAVA_HOME environment variable set prior to running the distribution.

If you installed using an automatic installer, you can run LogicBlaze FUSE by double clicking the shortcut icon that was created during installation.

You can also run LogicBlaze FUSE through the console window or command line. Change to the installation directory:

```
cd [fuse_dir]
```

where `[fuse_dir]` is the directory in which LogicBlaze FUSE was installed, for example, `c:\Program Files\fuse-x.x`.

If you downloaded and built a source or developer's version of LogicBlaze FUSE the `bin` directory is located in: `[fuse_dir]\target\fuse-1.x-SNAPSHOT`.

Run the LogicBlaze FUSE distribution by typing:

```
bin\fuse
```

Working directories get created relative to the current directory. For the working directories to be created in the proper place, LogicBlaze FUSE must be launched from its `home/installation` directory.

Installing FUSE as a Windows Service

If you want to install LogicBlaze FUSE as a service in Windows, execute:

```
[fuse_dir]\bin\InstallFuse-NT.bat
```

Note: This can be done before or after LogicBlaze FUSE is running.

Once LogicBlaze FUSE is installed as a service, its "`Startup Type`" is "`Automatic`". You might have to manually start the LogicBlaze FUSE service first by typing:

```
sc start fuse
```

The next time you turn on your machine LogicBlaze FUSE will be running in the background.

5.2. Unix

From a command shell, change to the installation directory and run the fuse script:

```
cd [fuse_dir]
```

where `[fuse_dir]` is the directory in which LogicBlaze FUSE was installed. For example, `/usr/local/fuse-1.x`.

Then type:

```
nohup bin/fuse > /tmp/lbfuselog 2>&1 &
```

`/tmp/lbfuselog` may be changed to another file name.

Or you can also type:

```
fuse console
```

Working directories get created relative to the current directory. For the working directories to be created in the proper place, LogicBlaze FUSE must be launched from its `home/installation` directory.

Warning: Do NOT close the console or shell in which LogicBlaze FUSE was started, as that will terminate it (unless LogicBlaze FUSE was started with `nohup`).

Installing FUSE as a Unix Daemon

On Linux, LogicBlaze FUSE can be run as a daemon. Execute the following:

```
cd [fuse_dir]
```

where `[fuse_dir]` is the directory in which LogicBlaze FUSE was installed. For example, `/usr/local/fuse-1.x`.

Then type:

```
fuse start
```

This will start LogicBlaze FUSE running in the background.

6. Using the Console

The LogicBlaze FUSE Console is a portal that allows the user to perform deployments, view operational statistics, stop and start deployments, etc.

To view and use the console:

1. Start LogicBlaze FUSE running. See Starting LogicBlaze FUSE.

2. Once LogicBlaze FUSE is running, open a web browser at the following URL: http://localhost:8080/ and follow the instructions per the LogicBlaze FUSE Console Guide.

`localhost` should be replaced by the name of the server on which LogicBlaze FUSE is running. The port number, 8080, may also need to be replaced if the port number was changed from the default.

For more information on operating the Console, please refer to: *LogicBlaze FUSE Console Guide*.

7. Testing the Installation

If LogicBlaze FUSE is running without problems, the Window's console window or the Unix command shell will display something similar to the following log lines:

```
wrapper  | --> Wrapper Started as Console
wrapper  | Launching a JVM...
jvm 1    | Wrapper (Version 3.2.0) http://wrapper.tanukisoftware.org
jvm 1    |
jvm 1    | =====================================================
jvm 1    | FUSE by LogicBlaze, Inc. Copyright (c) 2006
jvm 1    | =====================================================
jvm 1    | For more information see: http://www.logicblaze.com/
jvm 1    | For support please contact: http://support.logicblaze.com/
jvm 1    |
jvm 1    | Fuse is starting up from install directory: C:\Development\LogicBlaze
\FUSE-1.2.x\FUSE-1.2.x
jvm 1    | INFO - FileDeployer.afterPropertiesSet(85) | Starting to load compone
nts from: C:\Development\LogicBlaze\FUSE-1.2.x\FUSE-1.2.x\components

[...]
jvm 1    | INFO - FileDeployer.createServiceForFile(349) | Registering spring se
rvices service: activemq/servicemix/portal/jetty-xbean.xml from: C:\Development\
LogicBlaze\FUSE-1.2.x\FUSE-1.2.x\components\activemq\servicemix\portal\jetty-
xbean.x
ml into the Kernel
jvm 1    | INFO - FileDeployer.afterPropertiesSet(90) | Loading completed
```

There are several ports that are listening after a successful start-up of LogicBlaze FUSE. Use the `netstat` command to search for those ports. This will verify that LogicBlaze FUSE started correctly. Some ports to look for:

- Apache ServiceMix default port is 1099. This is the RMI Registry port.
- The Web server listens on port 8080.
- One or more ActiveMQ JMS brokers may be listening on ports 61616 and 61617.

On Windows: Open a Windows console (not the console in which LogicBlaze FUSE was started) and type:

```
netstat -an|find "1099"
```

On Unix: From a Unix command shell, type:

```
netstat -an|grep 1099
```

You can use `netstat` with a find or a `grep` for any of the previously mentioned port numbers.

8. Stopping LogicBlaze FUSE

For both Windows and Unix installations, terminate LogicBlaze FUSE by typing CTRL-C in the command shell or console in which it is running.

If the runtime was started in the background on Unix, the process can be killed, with the following:

```
ps -ef|grep fuse
kill [PID]
```

where `[PID]` is the process id of the LogicBlaze FUSE process.

9. Configuring LogicBlaze FUSE

After the installation and startup, LogicBlaze FUSE is running with the recommended configuration. However, the user may customize the configuration files if desired.

If you are a developer who has used [Apache ActiveMQ](#) or [Apache ServiceMix](#) feel free to customize the default configurations directly.

Some important configuration files to look at:

Configuration File:

```
[fuse_dir]\components\activemq\activemq-xbean.xml
```

ServiceMix Configuration File:

```
[fuse_dir]\components\activemq\servicemix\servicemix-xbean.xml
```

Portal Configuration:

```
[fuse_dir]\components\activemq\servicemix\portal\jetty-xbean.xml
```

If you downloaded and built a source or developer's version of LogicBlaze FUSE the `components` directory is located in: `[fuse_dir]\target\fuse-1.x-SNAPSHOT`.

10. Monitoring with a JMX Console

LogicBlaze FUSE uses JMX extensively for its management and monitoring. To use a JMX Console, such as JConsole or MC4J, connect to LogicBlaze FUSE with the following JMX URI:

```
service:jmx:rmi:///jndi/rmi://localhost:1099/defaultJBIJMX
```

11. Security

LogicBlaze FUSE can be integrated to use JAAS and an LDAP server to handle security. Apache Directory is the LDAP server used and it comes pre-installed with the distribution. This section will provide you with the information needed on how the integration was done.

11.1. ApacheDS

The LogicBlaze FUSE distribution includes Apache Directory pre-configured for you. However, if you need to customize the configuration for Apache Directory, edit this file:

```
[fuse_dir]\shared\classes\apacheds.xml
```

where `[fuse_dir]` is the directory in which LogicBlaze FUSE was installed.

After editing the `apacheds.xml` restart FUSE for the changes to take effect.

Creating the root administrator

To create the root administrator, modify the properties of the environment bean accordingly:

```
<bean id="environment"
    class="org.springframework.beans.factory.config.PropertiesFactoryBean">
  ...
  <props>
    <prop key="java.naming.security.authentication">simple</prop>
    <prop key="java.naming.security.principal">uid=admin,ou=system</prop>
    <prop key="java.naming.security.credentials">secret</prop>
  ...
</bean>
```

The configuration bean contains properties used to create the initial data and where it will be stored.

1. The property called `workingDirectory` is used to specify where the LDAP data will be created:

```
<bean id="configuration"
    class="org.apache.directory.server.configuration.MutableServerStartupConfig
    uration">
  <property name="workingDirectory">
    <value>data/apacheds-data</value>
  </property>
...
```

2. The property called `ldifDirectory` is used to specify where the schema to create the initial data is located:

```
<bean id="configuration"
    class="org.apache.directory.server.configuration.MutableServerStartupConfig
    uration">
  ...
  <property name="ldifDirectory">
    <value>data/ldif</value>
  </property>
...
```

Starting and connecting to Apache Directory Server

To start Apache Directory server, a bean `org.logicblaze.ldap.StartDirectoryService` should be added in `[fuse_dir]/components/jndi/jndi-xbean.xml`. This bean requires a property called `xmlConfigResource` whose value is the location of the Apache Directory configuration file (`apacheds.xml`).

```
<bean id="apachedsService" class="org.logicblaze.ldap.StartDirectoryService">
  <property name="xmlConfigResource" value="classpath:apacheds.xml"/>
</bean>
```

A Java bean `org.logicblaze.ldap.bean.LDAPServerBean` can be used to store connection information on the Apache Directory Server. A JNDI entry reference to this Java bean was added in `[fuse_dir]/components/jndi/jndi-xbean.xml`.

```
<entry key="java:comp/env/ldap/apacheDS">
  <bean id="apacheds" class="org.logicblaze.ldap.bean.LDAPServerBean">
    <property name="initialContextFactory"
      value="com.sun.jndi.ldap.LdapCtxFactory"/>
    <property name="securityPrincipal" value="uid=admin,ou=system"/>
    <property name="securityCredentials" value="secret"/>
    <property name="securityProtocol" value="s"/>
    <property name="providerUrl" value="ldap://localhost:10389"/>
    <property name="securityAuthentication" value="simple"/>
    <property name="userBase" value="ou=users,ou=system"/>
    <property name="userSearchFilter" value="(uid={0})"/>
    <property name="roleBase" value="ou=roles,ou=system"/>
    <property name="roleSearchFilter" value="(cn={0})"/>
  </bean>
</entry>
```

11.2. Java Authentication and Authorization Service configuration

The LogicBlaze Fuse distribution also contains a pre-configured JAAS implementation. Here's how to customize the configuration:

1. The JAAS configuration file is located in `[fuse_dir]/shared/classes/jaas.conf`. Currently, it uses the ActiveMQ JAAS `LDAPLoginModule`.

2. Upon startup, a system variable "`java.security.auth.login.config`" is created whose value is the location of the JAAS configuration file (`jaas.conf`). This is done by setting the system variable in `[fuse_dir]/conf/wrapper.conf`:

```
wrapper.java.additional.2= -Djava
   .security.auth.login.config=./shared/classes/jaas.conf
```

3. Add a user realm in Jetty whose login module uses the one declared in the JAAS configuration (`jaas.conf`). This is done by modifying the file: `[fuse_dir]/components/activemq/servicemix/portal/jetty-xbean.xml`:

```xml
<jetty xmlns="http://mortbay.com/schemas/jetty/1.0">
  ....
  <userRealms>
    <bean xmlns="http://xbean.apache.org/schemas/spring/1.0"
      class="org.mortbay.jetty.plus.jaas.JAASUserRealm">
      <property name="callbackHandlerClass"
        value="org.mortbay.jetty.plus.jaas.callback.DefaultCallbackHandler" />
      <property name="loginModuleName" value="LoginLdapConfiguration" />
      <property name="name" value="LdapRealm" />
      <property name="roleCheckPolicy">
        <bean class="org.mortbay.jetty.plus.jaas.StrictRoleCheckPolicy" />
      </property>
    </bean>
  </userRealms>
</jetty>
```

4. A Web application may implement the configured JAAS using the login configuration property of its deployment descriptor (`web.xml`).

```xml
</web-app>
  ....
  <login-config>
    <auth-method>FORM</auth-method>
    <realm-name>LdapRealm</realm-name>
    <form-login-config>
      <form-login-page>/c/portal/j_login</form-login-page>
      <form-error-page>/c/portal/j_login_error</form-error-page>
    </form-login-config>
  </login-config>
  ...
```

12. Troubleshooting

This section provides solutions to commonly encountered problems.

12.1. Changing Jetty's Port Number

On starting up LogicBlaze FUSE, if you see a message similar to "address already in use" your host already has a web server install that is using port 8080. To resolve this modify Jetty's port number:

1. Stop LogicBlaze FUSE. For shutdown instructions please see the *Getting Started with LogicBlaze FUSE* manual.

2. Edit the file `jetty-xbean.xml`

    Binary Install: If using the Binary installation the path is
    `[fuse_dir]\components\activemq\servicemix\portal\jetty-xbean.xml`

    Source Install: If using the Source installation the path is `[fuse_dir]\target\fuse-1.x-SNAPSHOT\components\activemq\servicemix\portal\jetty-xbean.xml`

3. Search for a line similar to: `<nioConnector port="8080"/>`. Change 8080 to an available port number. The suggested range of port numbers is between 8000 and 9900; 8180, 8280, 8380 are all good choices if they are available on your server.

4. Save and exit the `jetty-xbean.xml` file.

5. Start LogicBlaze FUSE. Please see the *Getting Started with LogicBlaze Fuse* manual for instructions.

Warning: Do not edit anything else in the `jetty-xbean.xml` file, especially the web `contextPath`, as it will impact the ability to run the console.

---

13. Additional Resources and Support

Before trying to use LogicBlaze FUSE you may want to read the *Overview of LogicBlaze FUSE*.

A quick way to get started is to run either of the available demonstrations which are part of the LogicBlaze FUSE distribution. The first one is the grocery inventory demonstration that is located in the `demos\grocery-demo` directory under the directory in which LogicBlaze FUSE was installed. For instructions on running the demonstration, please see the *Grocery Inventory Tutorial*.

The other one is the loan broker demonstration that is located in the `demos\loanbroker` directory in which LogicBlaze FUSE was installed. See the *Loan Broker Demonstration Tutorial* for instructions on running this demonstration.

For more information on Apache Directory: http://directory.apache.org/

For more information on Java Authentication and Authorization Service:
http://java.sun.com/products/jaas/overview.html

If you need more help please feel free to contact LogicBlaze Support

For more information on Java Service Wrapper, please go to:
http://wrapper.tanukisoftware.org/doc/english/index.html