Deploying Tomcat on WEBppliance 3.1 for Linux

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WEBppliance 3.1 supports the latest version of Tomcat (v-4.0.3), developed by the Jakarta-Apache Project. Tomcat 4.0 implements the final released versions of the servlet 2.3 and JSP™ 1.2 specifications. As required by the specifications, Tomcat 4.0 also supports Web applications built for servlet 2.2 and JSP 1.1 specifications, with no changes. Additionally, the 4.0 servlet container (Catalina) provides greater flexibility and performance.

The Tomcat 4 package includes a set of tools designed to host Java™ Web applications. The package is shipped with the following:

- Sun® Java 2 Standard Edition (J2SE) development environment version 1.4, which includes J2SDK™ 1.4.0 and JRE (installed in /usr/java/j2sdk1.4.0/ and /usr/java/j2sdk1.4.0/jre/ respectively)
- Apache 1.3.22
- mod_jk 1.3
- Tomcat 4.0.3, installed in /var/tomcat4
- Database driver for MySQL and postgres, installed in /var/tomcat4/common/lib:
  - mm.mysql-2.0.4-bin.jar for MySQL
  - pgjdbc2.jar for postgres
- Tyrex, installed in /var/tomcat4/common/lib/tyrex-0.9.7.7.jar
- JNDI™, installed in /var/tomcat4/common/lib/jndi.jar
- Mail, installed in /var/tomcat4/common/lib/mail.jar

JSP and servlet operation

WEBppliance 3.1 (with the mod_jk module) has JSP and servlet functionality enabled on the Apache Web server. The Tomcat engine executes JSP and servlets. Once you enable Tomcat for a site, WEBppliance 3.1 instructs the Web server to send certain requests to Tomcat for processing. Tomcat requires an execution environment known as context, to be set up before it can execute JSPs and servlets properly.

A context is basically a directory structure on the server from which Tomcat can execute servlets and JSPs. WEBppliance 3.1 automatically sets contexts for you. You can also add a new context by uploading Java Web archive files (with the extension .war) into Web content directories. We do not support Web archives.

Deploying JSPs and servlets on WEBppliance 3.1

Deploying JSPs and servlets on WEBppliance 3.1 is as easy as uploading a Web site using any FTP client. When you enable Tomcat for a site using the Appliance Administrator interface, WEBppliance 3.1 creates a default Tomcat context, for the virtual site in the Web directory. The context path of each virtual site is /home/virtual/domainname/var/www/html/.

A new directory called WEB-INF is created in this directory. The WEB-INF directory contains some configuration information for Tomcat and a directory in which servlet class files are placed for deployment.

As long as the file extension of the JSP file is .jsp, the Site Administrator can simply load a JSP page in the directory /var/www/html/, and the Web server automatically passes it on to Tomcat for processing.

For example, if you have a file named test.jsp, the Site Administrator can use an FTP client to upload the file in the directory /var/www/html/. You can then access the dynamic JSP page through http://<*site name*>/test.jsp. The first time you access this page, Tomcat takes a few seconds to compile the page but subsequent accesses are much quicker. Compiling a servlet source Java file creates a servlet class file. Deploying a servlet on WEBppliance 3.1 includes uploading the servlet class file in /var/www/html/WEB-INF/classes/.

For example, if you have a file named test.class, you would use an FTP client to upload the file in /var/www/html/WEB-INF/classes/. The servlet is executed through http://<*site name*>/servlet/test.

Compiling a Java servlet source file

You can develop servlets manually through the command line and a text editor. WEBppliance 3.1 provides Java software development kit and Java run time environment for the Site Administrator. It installs a file java.sh in /etc/profile.d/. When you log on to the server, your shell sources this file and some relevant Java-environment variables are set up for you. You can add additional $CLASSPATH, for any site, by editing the file java.sh.

To compile a Java servlet source file into a Java class file for Tomcat:

1. Log on to WEBppliance 3.1 as Site Administrator.
2. Change to the directory in which the source servlet code file is located.
3. Enter the following command.

   `javac myServlet.java` (Substitute your file name for the file myServlet.java).

   If the compilation is successful and no errors are reported, the file myServlet.class can be located in the same directory.
4. To use this servlet, copy the file myServlet.class in the WEB-INF/classes directory.

Customizing Apache Tomcat

The standard, out-of-the-box configuration of Apache Tomcat may not fit your development needs. This is particularly true if your application requires elevated permissions, a custom JDBC™ driver or access to other Java classes stored on the server.

Site permissions

The default site permissions are set by the file /var/tomcat4/conf/sites.policies.d/site<*N*>.policy and the site context is set by the file /var/tomcat4/conf/sites.xml.d/site<*N*>.xml where site<*N*> is the site index.

To find out the site index for a particular site:

1. Log on to the server as root user.
2. To get the site index, enter the following command.

   sitelookup -d <*domain name*>

   The following output displays.

   <*domain name*>, admin<*N*>,site<*N*>,/home/virtual/<*domain name*>,<*admin name*>.

   The output indicates that the site index of <*domain name*> is site<*N*>.

For example, if a site is named www.myco.com has its site index as site<*N*>, then the file /var/tomcat4/conf/sites.policies.d/site<*N*>.policy will consist of default site permissions for site<*N*>. This file appends to the file catalina.policy.

Site context

The default site context is set by the file /var/tomcat4/conf/sites.xml.d/site<*N*>.xml.

The contents of the file site<*N*>.xml are:

```
<Host name="myco.com" appbase="/home/virtual/site<N>/fst/
var/www/html">
      <Alias>www.myco.com</Alias>
      <!-- Global logger unless overridden at lower levels --
      >
      <Logger
      className="org.apache.catalina.logger.FileLogger"
            directory="/home/virtual/site<N>/fst/var/log"
            prefix="tomcat4_log."
            timestamp="true"/>
      <Realm
      className="org.apache.catalina.realm.MemoryRealm" />
             <Context path=""
            docBase="/home/virtual/site<N>/fst/var/www/html"
            crossContext="false"
            reloadable="true" />
      sinclude(`/var/tomcat4/conf/sites.xml.d/
      site<N>.xml.custom')
</Host>
```

The default context for myco.com is /var/www/html in the domain file system of myco.com .This file appends to the file server.xml.

Security permissions

All Tomcat contexts, added by the WEBppliance 3.1, receive a default set of security permissions. The default security permissions are as follows:

```
grant codeBase “file:/home/virtual/site<N>/fst/var/www/html/
-” {permission java.net.SocketPermission “*”, "connect”;}
permission
```

To add security permissions for a site:

1. Log on to WEBppliance 3.1 as root user.
2. Change directory to /var/tomcat4/conf/ sites.policies.d/.
3. In this directory, create the file site<*N*>.policy.custom.
4. In the file site<*N*>.policy.custom, add the required security permissions. The contents of this file are appended to the file /var/tomcat4/conf/ catalina.policy.
5. To clear the cache and to enable new changes in /var/tomcat4/work/ domainname, type the following commands.

   ```
   cd /var/tomcat4/work/
   rm -rf *
   ```

6. Press **Enter.**

7 To restart Tomcat, type the following command.

```
/etc/rc.d/init.d/tomcat4 restart
```

Note: When adding security permissions for a site:

- Do **not** make any direct changes to the files /var/tomcat4/conf/catalina.policy or site<*N*>.policy, as these changes will be overwritten by the configuration scripts in WEBppliance 3.1.
- Edit the file site<*N*>.policy.custom. This will be appended to the file catalina.policy.
- Be aware that allowing all security permissions may open up the site to hackers
- Be aware that syntax errors may result in Tomcat failing to start.
- Edit /var/tomcat4/conf/catalina.policy.template to set global settings - applicable to all sites.
- Back up conf files before editing them.
- Restart Tomcat to apply the changes.

Context path

All Tomcat enabled sites receive default context path as /var/www/html/.
As an Appliance Administrator you can add an additional context path.

To add an additional context path;

1. Log on to WEBppliance 3.1 as root user.
2. Change directory to /var/tomcat4/conf/sites.xml.d/.
3. In this directory, create a file site<*N*>.xml.custom.
4. In the file site<*N*>.xml.custom, add the additional context. The text in this file is appended to the file server.xml.
5. To clear the cache in order to enable new changes in /var/tomcat4/work/ domain name, type the following commands.

   ```
   cd /var/tomcat4/work/
   rm -rf *
   ```

6. Press **Enter.**
7. To restart Tomcat, type the following command.

   ```
   /etc/rc.d/init.d/tomcat4 restart
   ```

Note: When adding an additional context path;

- Do **not** make any direct changes to the files /var/tomcat4/conf/server.xml or site<*N*>.xml, as these changes will be overwritten by the configuration scripts in WEBppliance 3.1.
- Edit the file site<*N*>.xml.custom. This will be appended to the file server.xml.
- Be aware that syntax errors may result in Tomcat failing to start.
- Edit /var/tomcat4/conf/server.xml.template to set global settings - applicable to all sites.
- Back up conf files before editing them.
- Restart Tomcat to apply the changes.

Class path for database drivers and other classes

WEBppliance provides database drivers for MySQL and postgres. You may come across a situation where the default class path for Tomcat does not suffice and you need to indicate the path for your own classes that exist elsewhere on the file system.

If you want to add additional classes (for example, a new JDBC driver) to Tomcat's default CLASSPATH, add CLASSPATH=$CLASSPATH:/path/to/my/new/class in the file java.sh, located at /etc/profile.d/, of a domain file system.

For the changes to take effect, restart the Web server and the Tomcat engine. Only root users can set new CLASSPATH for any Web site. If you want to add new database driver or component, which should be available to all sites, add it to:

- /var/tomcat4/common/classes – if it is a class file
- /var/tomcat4/common/lib – if it is a jar file

An example of deploying JSP and servlet Web site

Create a Web site with the domain name myco.com with Tomcat development environment enabled, and set the Site Administrator name as adminmyco.

Assumptions:

- The Web site is developed on Sun J2SE 1.4
- The site number is 1

To upload myco.com:

1. Log on to myco.com as adminmyco, using any FTP client.
2. Upload all class files to /var/www/html/WEB-INF/classes.
3. Upload all lib files to /var/www/html/WEB-INF/lib.
4. Upload the file web.xml to /var/www/html/WEB-INF/.
5. Upload the remaining Web site to /var/www/html/.

Note: Use javac *.java, if you want to compile any .java files.

Adding permissions

To add permissions to connect to the SMTP server:

1. Log on to WEBppliance 3.1 as root user.
2. Change directory to /var/tomcat4/conf/sites.policy.d.
3. Create a new file site1.policy.custom.
4. In the file site1.policy.custom, include the following lines to add permissions to connect to the SMTP server.

   Permission java.net.SocketPermission "127.0.0.1:25","listen, connect, accept, resolve";
   Permission java.net.SocketPermission "localhost: 25","listen, connect, accept, resolve";
5. Save the file site1.policy.custom.
6. To restart Tomcat, type the following command.

   /etc/rc.d/init.d/tomcat4 restart

Adding additional context

To add additional context:

1. Log on to WEBppliance 3.1 as root user.
2. Change directory to /var/tomcat4/conf/sites.xml.d.
3. Create a new file site1.xml.custom.
4. Add new context to the file site1.xml.custom.
5. Save the file site1.xml.custom.
6. To restart Tomcat, type the following command.

   /etc/rc.d/init.d/tomcat4 restart

Enabling Tomcat on WEBppliance 3.1

> **Important:** To install Tomcat in WEBppliance 3.1, you must meet the following minimum system requirements.
> **Processor** - Intel® Pentium® III
> **Memory** - 512 MB of RAM

In WEBppliance 3.1, by default, the Tomcat status is **ON.**

To manually start Tomcat:

1. Log on to WEBppliance 3.1 as Appliance Administrator.
2. In the Appliance Administrator interface, click **Services** in the left navigation bar.
3. In the Services window, locate the Tomcat service.
4. In the **Actions** column, click the **Start** icon.

To automatically start Tomcat:

1. Log on to WEBppliance 3.1 as root user.
2. Type the following commands in the order specified.

```
/etc/rc.d/init.d/tomcat4 stop
/sbin/chkconfig --add tomcat4
/etc/rc.d/init.d/tomcat4 start
```

3. Press **Enter.**

Disabling the Tomcat engine

You can disable Tomcat permanently if you no longer want to use Tomcat. You can turn off the Java virtual machines that handles the requests and prevent Tomcat from launching in the future.

To disable Tomcat:

1. Log on to the WEBppliance 3.1 as Appliance Administrator.
2. Type **su -**.

   The system prompts you for a password.
3. Enter the root password.

   You now have root privileges, which means that you can change anything on the server appliances's operating system.
4. Type the following commands in the order specified.

   ```
   /sbin/chkconfig --del tomcat4
   /etc/rc.d/init.d/tomcat4 stop
   ```
5. Press **Enter**.

Resources

For more information on Tomcat, refer to the following links.

1. http://jakarta.apache.org/tomcat/tomcat-4.0-doc/index.html
2. http://www.jguru.com/faq/Tomcat
3. http://java.sun.com/j2se/1.4/index.html
4. http://jakarta.apache.org/site/mail.html
5. http://mmmysql.sourceforge.net
6. http://jdbc.postgresql.org
7. http://jdbc.postgresql.org/doc.html
8. http://www.exolab.org
9. http://jakarta.apache.org/ant/index.html

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