



Apache Tomcat Web Server

By Mr. Ashok

WhatsApp Us : +91-99 85 39 66 77

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Apache Tomcat

- ➔ Apache Tomcat is a web server
- ➔ Tomcat is used to run Java Web Applications
- ➔ Tomcat is free & open-source software
- ➔ Tomcat developed by Apache Organization
- ➔ Tomcat developed by using 'Java' programming language
- ➔ Tomcat server runs on 8080 port by default (we can change that port in server.xml file)

Apache Tomcat Setup in Linux Machine

- ➔ To run Apache Tomcat Server first we need to install Java

Amazon Linux : `$ sudo yum install java`

Ubunut : `$ sudo apt install default-jdk`

```
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$ sudo yum install java-1.8.0-openjdk  
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd  
amzn2-core | 3.7 kB 00:00:00  
Package 1:java-1.8.0-openjdk-1.8.0.332.b09-1.amzn2.0.2.x86_64 already installed and latest version  
Nothing to do  
[ec2-user@ip-172-31-39-68 ~]$
```

- ➔ Download Apache Tomcat using 'wget' command
(Apache URL we can get from Apache website)

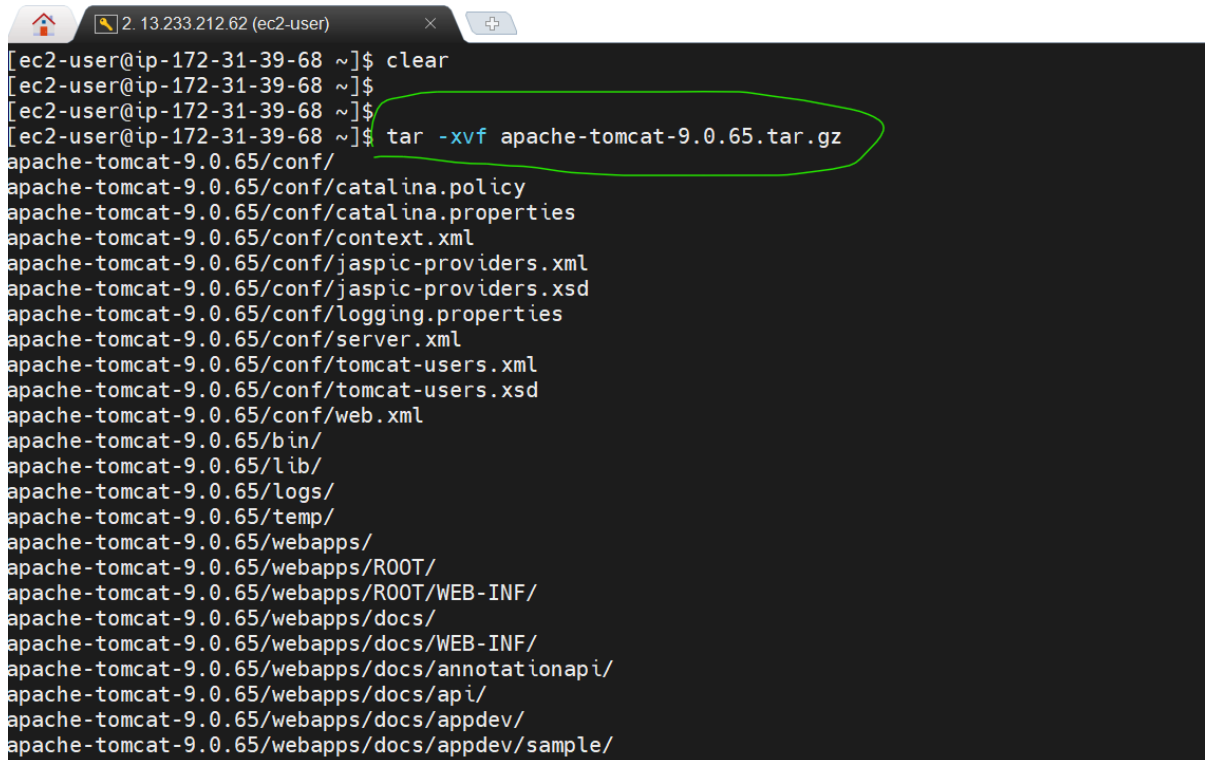
URL : <https://tomcat.apache.org/download-90.cgi>

`$ wget https://d1cdn.apache.org/tomcat/tomcat-9/v9.0.73/bin/apache-tomcat-9.0.73.tar.gz`

```
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$ wget https://d1cdn.apache.org/tomcat/tomcat-9/v9.0.65/bin/apache-tomcat-9.0.65.tar.gz  
--2022-08-27 06:40:35-- https://d1cdn.apache.org/tomcat/tomcat-9/v9.0.65/bin/apache-tomcat-9.0.65.tar.gz  
Resolving d1cdn.apache.org (d1cdn.apache.org) ... 151.101.2.132, 2a04:4e42::644  
Connecting to d1cdn.apache.org (d1cdn.apache.org)|151.101.2.132|:443 ... connected.  
HTTP request sent, awaiting response ... 200 OK  
Length: 11593900 (11M) [application/x-gzip]  
Saving to: 'apache-tomcat-9.0.65.tar.gz'  
  
100%[=====] 11,593,900 --K/s in 0.05s  
2022-08-27 06:40:36 (231 MB/s) - 'apache-tomcat-9.0.65.tar.gz' saved [11593900/11593900]
```

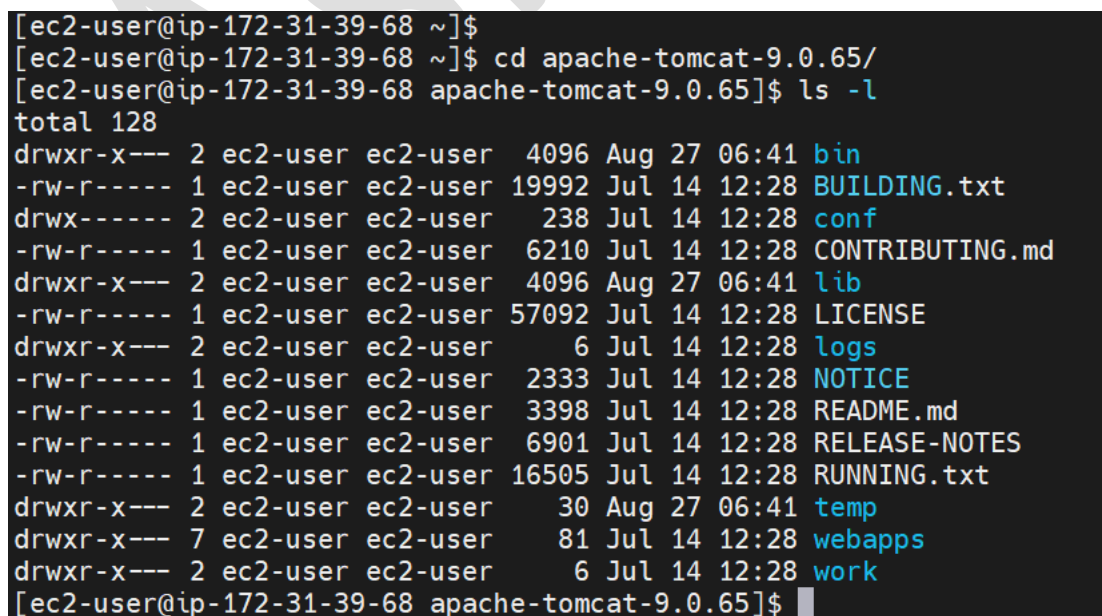
➔ Extract Apache Tomcat tar file using tar command

\$ tar <tomcat-directory-name>

A terminal window titled '2. 13.233.212.62 (ec2-user)' shows the command 'tar -xvf apache-tomcat-9.0.65.tar.gz' being executed. The command is highlighted with a green oval. The output lists the contents of the tar archive, including configuration files, binaries, and web applications.

```
[ec2-user@ip-172-31-39-68 ~]$ clear
[ec2-user@ip-172-31-39-68 ~]$ 
[ec2-user@ip-172-31-39-68 ~]$ tar -xvf apache-tomcat-9.0.65.tar.gz
apache-tomcat-9.0.65/conf/
apache-tomcat-9.0.65/conf/catalina.policy
apache-tomcat-9.0.65/conf/catalina.properties
apache-tomcat-9.0.65/conf/context.xml
apache-tomcat-9.0.65/conf/jaspic-providers.xml
apache-tomcat-9.0.65/conf/jaspic-providers.xsd
apache-tomcat-9.0.65/conf/logging.properties
apache-tomcat-9.0.65/conf/server.xml
apache-tomcat-9.0.65/conf/tomcat-users.xml
apache-tomcat-9.0.65/conf/tomcat-users.xsd
apache-tomcat-9.0.65/conf/web.xml
apache-tomcat-9.0.65/bin/
apache-tomcat-9.0.65/lib/
apache-tomcat-9.0.65/logs/
apache-tomcat-9.0.65/temp/
apache-tomcat-9.0.65/webapps/
apache-tomcat-9.0.65/webapps/ROOT/
apache-tomcat-9.0.65/webapps/ROOT/WEB-INF/
apache-tomcat-9.0.65/webapps/docs/
apache-tomcat-9.0.65/webapps/docs/WEB-INF/
apache-tomcat-9.0.65/webapps/docs/annotationapi/
apache-tomcat-9.0.65/webapps/docs/api/
apache-tomcat-9.0.65/webapps/docs/appdev/
apache-tomcat-9.0.65/webapps/docs/appdev/sample/
```

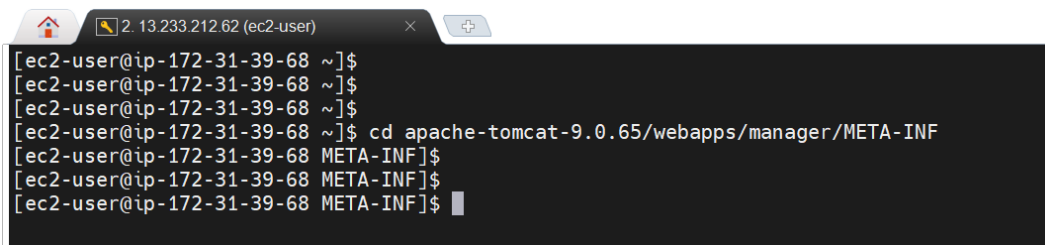
➔ We can see Apache Tomcat files using ls command like below

A terminal window shows the user navigating to the 'apache-tomcat-9.0.65' directory and running 'ls -l'. The output displays a detailed list of files and directories with their permissions, ownership, size, and modification date.

```
[ec2-user@ip-172-31-39-68 ~]$ 
[ec2-user@ip-172-31-39-68 ~]$ cd apache-tomcat-9.0.65/
[ec2-user@ip-172-31-39-68 apache-tomcat-9.0.65]$ ls -l
total 128
drwxr-x--- 2 ec2-user ec2-user 4096 Aug 27 06:41 bin
-rw-r----- 1 ec2-user ec2-user 19992 Jul 14 12:28 BUILDING.txt
drwx----- 2 ec2-user ec2-user 238 Jul 14 12:28 conf
-rw-r----- 1 ec2-user ec2-user 6210 Jul 14 12:28 CONTRIBUTING.md
drwxr-x--- 2 ec2-user ec2-user 4096 Aug 27 06:41 lib
-rw-r----- 1 ec2-user ec2-user 57092 Jul 14 12:28 LICENSE
drwxr-x--- 2 ec2-user ec2-user 6 Jul 14 12:28 logs
-rw-r----- 1 ec2-user ec2-user 2333 Jul 14 12:28 NOTICE
-rw-r----- 1 ec2-user ec2-user 3398 Jul 14 12:28 README.md
-rw-r----- 1 ec2-user ec2-user 6901 Jul 14 12:28 RELEASE-NOTES
-rw-r----- 1 ec2-user ec2-user 16505 Jul 14 12:28 RUNNING.txt
drwxr-x--- 2 ec2-user ec2-user 30 Aug 27 06:41 temp
drwxr-x--- 7 ec2-user ec2-user 81 Jul 14 12:28 webapps
drwxr-x--- 2 ec2-user ec2-user 6 Jul 14 12:28 work
[ec2-user@ip-172-31-39-68 apache-tomcat-9.0.65]$
```

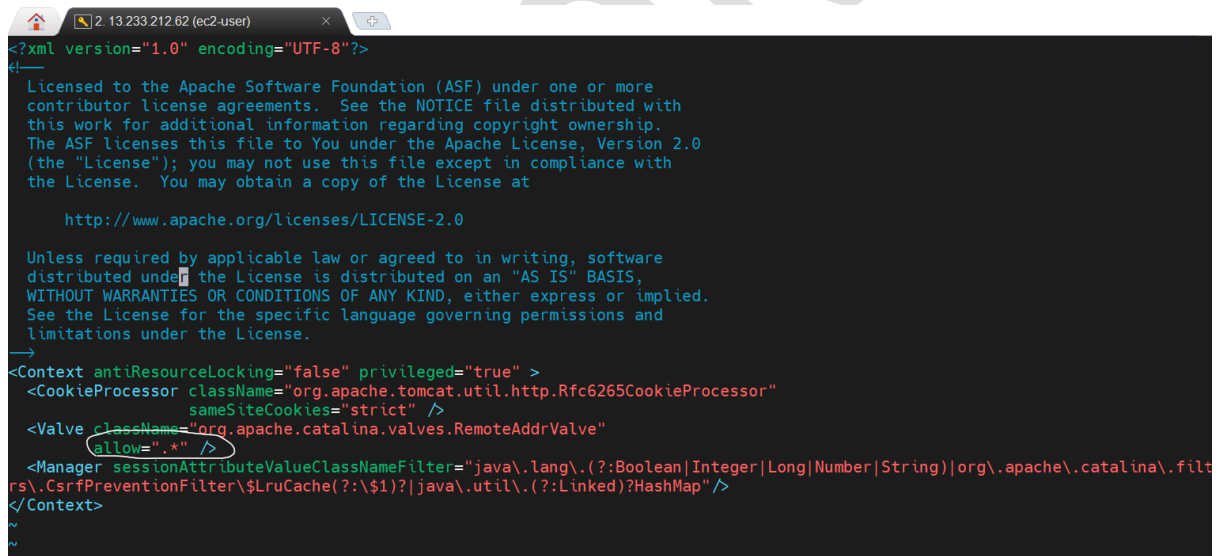
- ➔ To deploy applications into Tomcat server we will use Host Manager
- ➔ By default, the Host Manager is only accessible from a browser running on the same machine as Tomcat. If you wish to modify this restriction, you'll need to edit the Host Manager's context.xml file.

File Location: <tomcat-folder>/webapps/manager/META-INF/context.xml



```
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$  
[ec2-user@ip-172-31-39-68 ~]$ cd apache-tomcat-9.0.65/webapps/manager/META-INF  
[ec2-user@ip-172-31-39-68 META-INF]$  
[ec2-user@ip-172-31-39-68 META-INF]$  
[ec2-user@ip-172-31-39-68 META-INF]$
```

- ➔ In Manager context.xml file, change <Valve> section like below (allow attribute value changed)

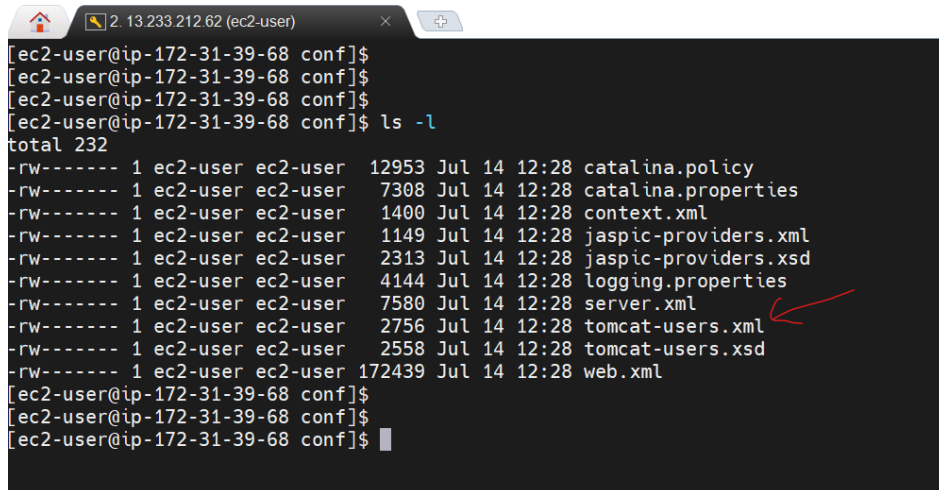


```
<?xml version="1.0" encoding="UTF-8"?>  
...  
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this work for additional information regarding copyright ownership.  
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http://www.apache.org/licenses/LICENSE-2.0  
  
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distributed under the License is distributed on an "AS IS" BASIS,  
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  
See the License for the specific language governing permissions and  
limitations under the License.  
...  
<Context antiResourceLocking="false" privileged="true" >  
  <CookieProcessor className="org.apache.tomcat.util.http.Rfc6265CookieProcessor"  
    sameSiteCookies="strict" />  
  <Valve className="org.apache.catalina.valves.RemoteAddrValve"  
    allow="*" />  
  <Manager sessionAttributeValueClassNameFilter="java\\.lang\\.?(Boolean|Integer|Long|Number|string)|org\\.apache\\.catalina\\.filt  
rs\\.CsrfPreventionFilter\\$LruCache(?:\\$1)?|java\\.util\\.?(?:Linked)?HashMap"/>  
</Context>  
...
```

Adding Users in Tomcat Server

➔ We need to add users in tomcat server to perform admin activities

File Location: <tomcat-folder>/conf/tomcat-users.xml



```

[ec2-user@ip-172-31-39-68 conf]$
[ec2-user@ip-172-31-39-68 conf]$
[ec2-user@ip-172-31-39-68 conf]$
[ec2-user@ip-172-31-39-68 conf]$ ls -l
total 232
-rw-r--r-- 1 ec2-user ec2-user 12953 Jul 14 12:28 catalina.policy
-rw-r--r-- 1 ec2-user ec2-user 7308 Jul 14 12:28 catalina.properties
-rw-r--r-- 1 ec2-user ec2-user 1400 Jul 14 12:28 context.xml
-rw-r--r-- 1 ec2-user ec2-user 1149 Jul 14 12:28 jaspic-providers.xml
-rw-r--r-- 1 ec2-user ec2-user 2313 Jul 14 12:28 jaspic-providers.xsd
-rw-r--r-- 1 ec2-user ec2-user 4144 Jul 14 12:28 logging.properties
-rw-r--r-- 1 ec2-user ec2-user 7580 Jul 14 12:28 server.xml
-rw-r--r-- 1 ec2-user ec2-user 2756 Jul 14 12:28 tomcat-users.xml
-rw-r--r-- 1 ec2-user ec2-user 2558 Jul 14 12:28 tomcat-users.xsd
-rw-r--r-- 1 ec2-user ec2-user 172439 Jul 14 12:28 web.xml
[ec2-user@ip-172-31-39-68 conf]$
[ec2-user@ip-172-31-39-68 conf]$
[ec2-user@ip-172-31-39-68 conf]$
  
```

➔ Add below Roles and Users in tomcat-users.xml file

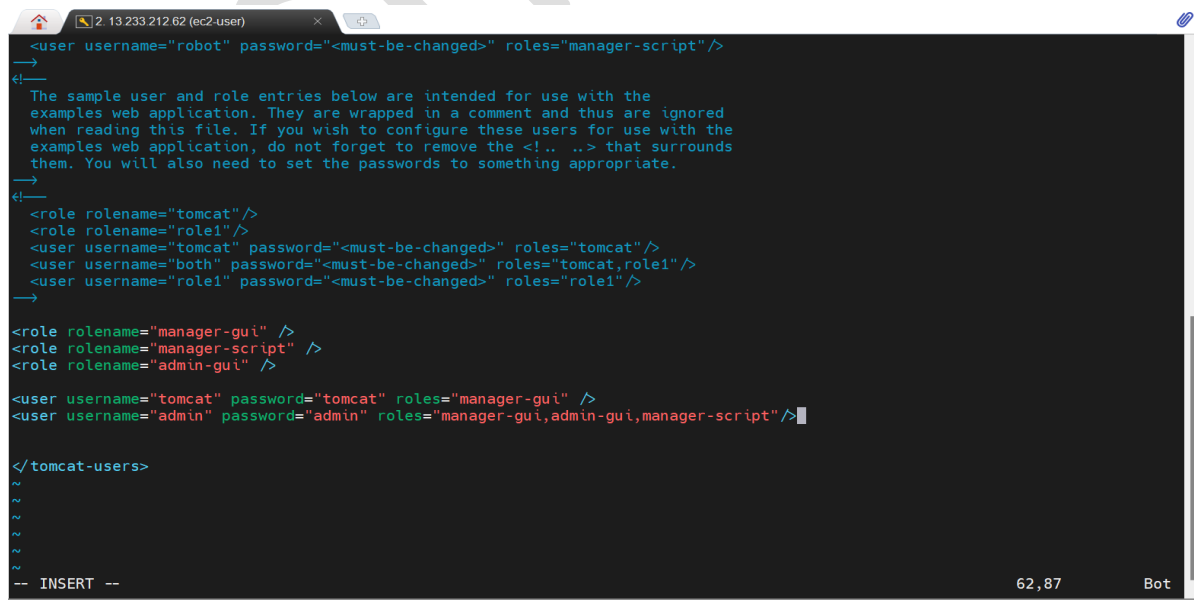
```
<role rolename="manager-gui" />
```

```
<role rolename="manager-script" />
```

```
<role rolename="admin-gui" />
```

```
<user username="tomcat" password="tomcat" roles="manager-gui" />
```

```
<user username="admin" password="admin" roles="manager-gui,admin-gui,manager-script"/>
```



```

<user username="robot" password="<must-be-changed>" roles="manager-script"/>
<!--
The sample user and role entries below are intended for use with the
examples web application. They are wrapped in a comment and thus are ignored
when reading this file. If you wish to configure these users for use with the
examples web application, do not forget to remove the <!-- .. --> that surrounds
them. You will also need to set the passwords to something appropriate.
-->
<role rolename="tomcat"/>
<role rolename="role1"/>
<user username="tomcat" password="<must-be-changed>" roles="tomcat"/>
<user username="both" password="<must-be-changed>" roles="tomcat,role1"/>
<user username="role1" password="<must-be-changed>" roles="role1"/>

<role rolename="manager-gui" />
<role rolename="manager-script" />
<role rolename="admin-gui" />

<user username="tomcat" password="tomcat" roles="manager-gui" />
<user username="admin" password="admin" roles="manager-gui,admin-gui,manager-script"/>

</tomcat-users>
~
~
~
~
-- INSERT --
  
```

to connect MakeVScode to the professional editor, please visit: <https://code.visualstudio.com/docs/editor/remote>

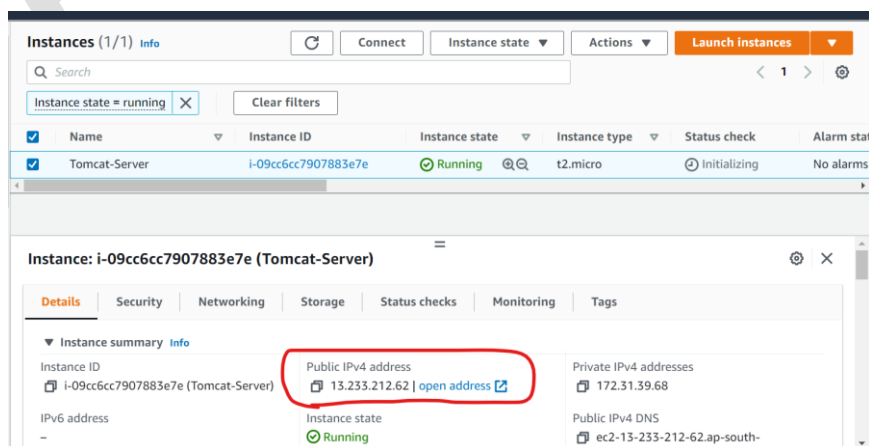
➔ After adding users, go to bin directory and start the Tomcat server

```
[ec2-user@ip-172-31-39-68 bin]$  
[ec2-user@ip-172-31-39-68 bin]$  
[ec2-user@ip-172-31-39-68 bin]$ ls -l  
total 892  
-rw-r----- 1 ec2-user ec2-user 34700 Jul 14 12:28 bootstrap.jar  
-rw-r----- 1 ec2-user ec2-user 16840 Jul 14 12:28 catalina.bat  
-rwxr-x--- 1 ec2-user ec2-user 25294 Jul 14 12:28 catalina.sh  
-rw-r----- 1 ec2-user ec2-user 1664 Jul 14 12:28 catalina-tasks.xml  
-rw-r----- 1 ec2-user ec2-user 2123 Jul 14 12:28 ciphers.bat  
-rwxr-x--- 1 ec2-user ec2-user 1997 Jul 14 12:28 ciphers.sh  
-rw-r----- 1 ec2-user ec2-user 25410 Jul 14 12:28 commons-daemon.jar  
-rw-r----- 1 ec2-user ec2-user 211777 Jul 14 12:28 commons-daemon-native.tar.gz  
-rw-r----- 1 ec2-user ec2-user 2040 Jul 14 12:28 configtest.bat  
-rwxr-x--- 1 ec2-user ec2-user 1922 Jul 14 12:28 configtest.sh  
-rwxr-x--- 1 ec2-user ec2-user 9100 Jul 14 12:28 daemon.sh  
-rw-r----- 1 ec2-user ec2-user 2091 Jul 14 12:28 digest.bat  
-rwxr-x--- 1 ec2-user ec2-user 1965 Jul 14 12:28 digest.sh  
-rw-r----- 1 ec2-user ec2-user 3606 Jul 14 12:28 makebase.bat  
-rwxr-x--- 1 ec2-user ec2-user 3382 Jul 14 12:28 makebase.sh  
-rw-r----- 1 ec2-user ec2-user 3460 Jul 14 12:28 setclasspath.bat  
-rwxr-x--- 1 ec2-user ec2-user 3708 Jul 14 12:28 setclasspath.sh  
-rw-r----- 1 ec2-user ec2-user 2020 Jul 14 12:28 shutdown.bat  
-rwxr-x--- 1 ec2-user ec2-user 1902 Jul 14 12:28 shutdown.sh  
-rw-r----- 1 ec2-user ec2-user 2022 Jul 14 12:28 startup.bat  
-rwxr-x--- 1 ec2-user ec2-user 1904 Jul 14 12:28 startup.sh  
-rw-r----- 1 ec2-user ec2-user 47050 Jul 14 12:28 tomcat-juli.jar  
-rw-r----- 1 ec2-user ec2-user 436593 Jul 14 12:28 tomcat-native.tar.gz  
-rw-r----- 1 ec2-user ec2-user 4574 Jul 14 12:28 tool-wrapper.bat  
-rwxr-x--- 1 ec2-user ec2-user 5540 Jul 14 12:28 tool-wrapper.sh  
-rw-r----- 1 ec2-user ec2-user 2026 Jul 14 12:28 version.bat  
-rwxr-x--- 1 ec2-user ec2-user 1908 Jul 14 12:28 version.sh  
[ec2-user@ip-172-31-39-68 bin]$
```

➔ Start the tomcat server using 'sh startup.sh' command

```
[ec2-user@ip-172-31-39-68 bin]$  
[ec2-user@ip-172-31-39-68 bin]$  
[ec2-user@ip-172-31-39-68 bin]$ sh startup.sh  
Using CATALINA_BASE: /home/ec2-user/apache-tomcat-9.0.65  
Using CATALINA_HOME: /home/ec2-user/apache-tomcat-9.0.65  
Using CATALINA_TMPDIR: /home/ec2-user/apache-tomcat-9.0.65/temp  
Using JRE_HOME: /usr  
Using CLASSPATH: /home/ec2-user/apache-tomcat-9.0.65/bin/bootstrap.jar:/home/ec2-user/apache-tomcat-9.0.65/bin/tomcat-juli.jar  
Using CATALINA_OPTS:  
Tomcat started.  
[ec2-user@ip-172-31-39-68 bin]$
```

➔ Once Tomcat Server started, we can access Tomcat Server admin console using EC2 Instance Public IP



➔ Make 8080 port number is enabled in your EC2 Instance Security Group

Inbound rules Info						
Security group rule ID	Type Info	Protocol Info	Port range Info	Source Info	Description - optional Info	
sgr-03d000567750d8334	All TCP	TCP	0 - 65535	Custom 0.0.0.0/0		
sgr-0d0c5e3fe923ac940	SSH	TCP	22	Custom 0.0.0.0/0		
sgr-0e5ab69805683aad9	HTTP	TCP	80	Custom 0.0.0.0/0		
-	Custom TCP	TCP	8080	Anywh... 0.0.0.0/0		

➔ We can access Tomcat Server in our Browser like below


EC2 Management Console x Apache Tomcat/9.0.65 x +

Not secure | 13.233.212.62:8080

Home Documentation Configuration Examples Wiki Mailing Lists Find Help

Apache Tomcat/9.0.65

If you're seeing this, you've successfully installed Tomcat. Congratulations!

 Recommended Reading:

- [Security Considerations How-To](#)
- [Manager Application How-To](#)
- [Clustering/Session Replication How-To](#)

Server Status
Manager App
Host Manager

Developer Quick Start

- [Tomcat Setup](#)
- [Realms & AAA](#)
- [Examples](#)
- [Servlet Specifications](#)

- [First Web Application](#)
- [JDBC DataSources](#)
- [Tomcat Versions](#)

➔ Click on **Manager App** to deploy the application (It will ask credentials, enter the credentials which we have configured in 'tomcat-users.xml' file)

Sign in

http://13.233.212.62:8080

Your connection to this site is not private

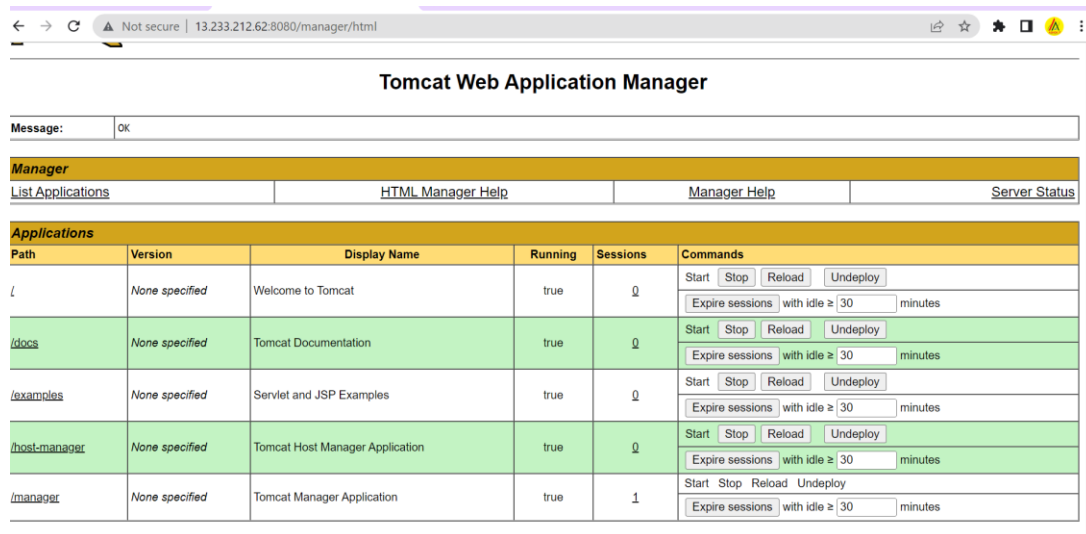
Username

Password

Sign in

Cancel

➔ After Login Success we can see below List of Applications Running in Tomcat (these are default applications)



The screenshot shows the Tomcat Web Application Manager interface in a web browser. The browser address bar shows '13.233.212.62:8080/manager/html'. The page title is 'Tomcat Web Application Manager'. Below the title, there is a 'Message:' field with 'OK'. A navigation bar includes links for 'List Applications', 'HTML Manager Help', 'Manager Help', and 'Server Status'. The main content area is titled 'Applications' and contains a table with columns: Path, Version, Display Name, Running, Sessions, and Commands. The table lists five default applications: '/', '/docs', '/examples', '/host-manager', and '/manager'. Each application row has a 'Commands' section with buttons for Start, Stop, Reload, and Undeploy, along with an 'Expire sessions' option set to 30 minutes.

Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/examples	None specified	Servlet and JSP Examples	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/host-manager	None specified	Tomcat Host Manager Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/manager	None specified	Tomcat Manager Application	true	1	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

Note: After running Jenkins job, we can see application here...

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