

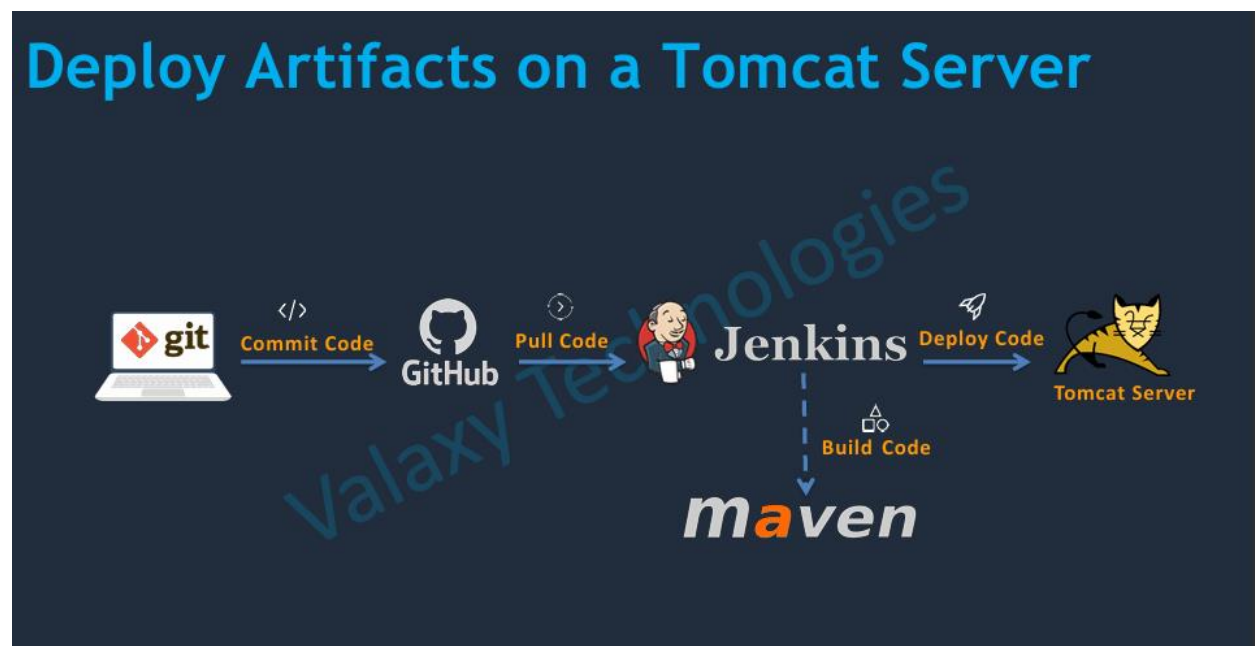
We have seen how to build our code.

Now, we can see how to deploy our code in a target environment.

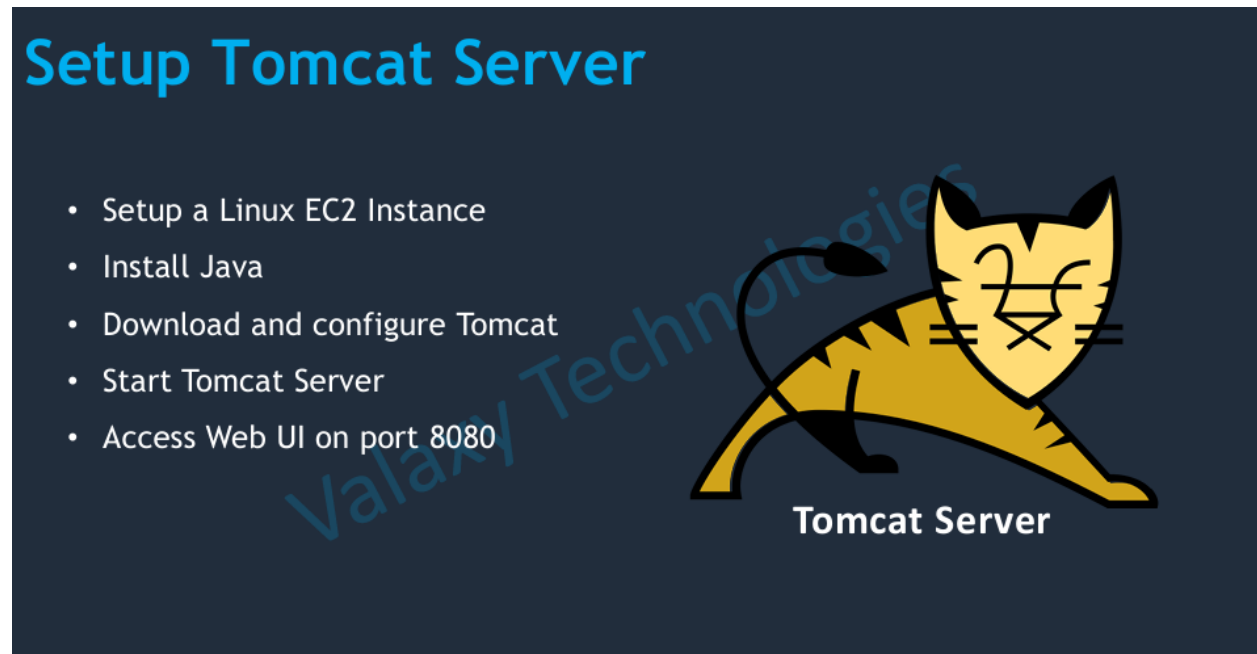
As a target environment we are going to use tomcat server.

So, I will setup ec2 instance and on top of that one we will install tomcat

Then we are going to set up Jenkins' job which is going to deploy the code onto the Tomcat server.



1. Setup Tomcat server



1.1 Setup a Linux EC2 Instance with port number 8080

1.2 install Java.

```
# amazon-linux-extras
```

```
# amazon-linux-extras install java-openjdk11
```

```
# java --version
```

```
[root@tomcat ~]#  
[root@tomcat ~]#  
[root@tomcat ~]# java --version  
openjdk 11.0.22 2024-01-16 LTS  
OpenJDK Runtime Environment (Red_Hat-11.0.22.0.7-1.amzn2.0.1) (build 11.0.22+7-LTS)  
OpenJDK 64-Bit Server VM (Red_Hat-11.0.22.0.7-1.amzn2.0.1) (build 11.0.22+7-LTS, mixed mode, sharing)  
[root@tomcat ~]#
```

1.3 Download and configure Tomcat

For tomcat download

[Apache Tomcat® - Apache Tomcat 9 Software Downloads](https://tomcat.apache.org/download90.cgi)

```
[root@tomcat ~]# cd /opt/
[root@tomcat opt]#
[root@tomcat opt]# wget https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.89/bin/apache-tomcat-9.0.89.tar.gz
--2024-05-15 07:28:36-- https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.89/bin/apache-tomcat-9.0.89.tar.gz
Resolving dlcdn.apache.org (dlcdn.apache.org)... 151.101.2.132, 2a04:4e42::644
Connecting to dlcdn.apache.org (dlcdn.apache.org)|151.101.2.132|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11756919 (11M) [application/x-gzip]
Saving to: 'apache-tomcat-9.0.89.tar.gz'

100%[=====] 11,756,919  --.-K/s  in 0.08s

2024-05-15 07:28:36 (149 MB/s) - 'apache-tomcat-9.0.89.tar.gz' saved [11756919/11756919]

[root@tomcat opt]# ls
apache-tomcat-9.0.89.tar.gz  aws  rh
[root@tomcat opt]#
[root@tomcat opt]# tar -xvzf apache-tomcat-9.0.89.tar.gz
apache-tomcat-9.0.89/conf/
apache-tomcat-9.0.89/conf/catalina.policy
apache-tomcat-9.0.89/conf/catalina.properties
apache-tomcat-9.0.89/conf/context.xml
```


```
[root@tomcat opt]# ls
apache-tomcat-9.0.89  apache-tomcat-9.0.89.tar.gz  aws  rh
[root@tomcat opt]#
[root@tomcat opt]# mv apache-tomcat-9.0.89 tomcat
[root@tomcat opt]#
[root@tomcat opt]# ls
apache-tomcat-9.0.89.tar.gz  aws  rh  tomcat
[root@tomcat opt]#
[root@tomcat opt]# cd tomcat/
[root@tomcat tomcat]#
[root@tomcat tomcat]# ls
bin  BUILDING.txt  conf  CONTRIBUTING.md  lib  LICENSE  logs  NOTICE  README.md  RELEASE-NOTES  RUNNING.txt  temp  webapps  work
[root@tomcat tomcat]# cd bin/
[root@tomcat bin]# ll
total 816
-rw-r----- 1 root root 35451 May 3 20:22 bootstrap.jar
-rw-r----- 1 root root 16856 May 3 20:22 catalina.bat
-rwxr-x--- 1 root root 25323 May 3 20:22 catalina.sh
-rw-r----- 1 root root 1664 May 3 20:22 catalina-tasks.xml
-rw-r----- 1 root root 2123 May 3 20:22 ciphers.bat
-rwxr-x--- 1 root root 1997 May 3 20:22 ciphers.sh
-rw-r----- 1 root root 25661 May 3 20:22 commons-daemon.jar
-rw-r----- 1 root root 214214 May 3 20:22 commons-daemon-native.tar.gz
-rw-r----- 1 root root 2040 May 3 20:22 configtest.bat
-rwxr-x--- 1 root root 1922 May 3 20:22 configtest.sh
-rwxr-x--- 1 root root 9100 May 3 20:22 daemon.sh
-rw-r----- 1 root root 2091 May 3 20:22 digest.bat
-rwxr-x--- 1 root root 1965 May 3 20:22 digest.sh
-rw-r----- 1 root root 3606 May 3 20:22 makebase.bat
-rwxr-x--- 1 root root 3382 May 3 20:22 makebase.sh
-rw-r----- 1 root root 3814 May 3 20:22 setclasspath.bat
-rwxr-x--- 1 root root 4317 May 3 20:22 setclasspath.sh
-rw-r----- 1 root root 2020 May 3 20:22 shutdown.bat
-rwxr-x--- 1 root root 1902 May 3 20:22 shutdown.sh
-rw-r----- 1 root root 2022 May 3 20:22 startup.bat
-rwxr-x--- 1 root root 1904 May 3 20:22 startup.sh
-rw-r----- 1 root root 49607 May 3 20:22 tomcat-juli.jar
-rw-r----- 1 root root 345276 May 3 20:22 tomcat-native.tar.gz
-rw-r----- 1 root root 4576 May 3 20:22 tool-wrapper.bat
-rwxr-x--- 1 root root 5540 May 3 20:22 tool-wrapper.sh
-rw-r----- 1 root root 2026 May 3 20:22 version.bat
-rwxr-x--- 1 root root 1908 May 3 20:22 version.sh
[root@tomcat bin]#
[root@tomcat bin]# ./startup.sh
Using CATALINA_BASE: /opt/tomcat
Using CATALINA_HOME: /opt/tomcat
Using CATALINA_TMPDIR: /opt/tomcat/temp
Using JRE_HOME: /usr
Using CLASSPATH: /opt/tomcat/bin/bootstrap.jar:/opt/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
[root@tomcat bin]#
[root@tomcat bin]#
```

Not secure | 3.110.184.8080

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Apache Tomcat/9.0.89

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

Now we need to access tomcat.

So, click on Manager App

403 Access Denied

You are not authorized to view this page.

By default the 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 Manager's `context.xml` file.

If you have already configured the Manager application to allow access and you have used your browser's back button, used a saved book-mark or similar then you may have triggered the cross-site scripting (XSS) protection. Once you return to this page, you will be able to continue using the Manager application's HTML interface normally. If you continue to see this access denied message, please see the [XSS Protection](#) page.

If you have not changed any configuration files, please examine the file `conf/tomcat-users.xml` in your installation. That file must contain the credentials to let you use this webapp.

For example, to add the `manager-gui` role to a user named `tomcat` with a password of `js3cret`, add the following to the config file listed above.

The above error showing this, you can access your browser from ec2 machine terminal.

It's accessible by your local host.

So, I need to modify context.html.

```
[root@tomcat tomcat]# pwd
/opt/tomcat
[root@tomcat tomcat]#
[root@tomcat tomcat]# ls
bin BUILDING.txt conf CONTRIBUTING.md lib LICENSE logs NOTICE README.md RELEASE-NOTES RUNNING.txt temp webapps work
[root@tomcat tomcat]#
[root@tomcat tomcat]# find / -name context.xml
/opt/tomcat/conf/context.xml
/opt/tomcat/webapps/docs/META-INF/context.xml
/opt/tomcat/webapps/examples/META-INF/context.xml
/opt/tomcat/webapps/host-manager/META-INF/context.xml
/opt/tomcat/webapps/manager/META-INF/context.xml
[root@tomcat tomcat]#
[root@tomcat tomcat]#
```

vim /opt/tomcat/webapps/host-manager/META-INF/context.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
 Licensed to the Apache Software Foundation (ASF) under one or more
 contributor license agreements. See the NOTICE file distributed with
 this work for additional information regarding copyright ownership.
 The ASF licenses this file to You under the Apache License, Version 2.0
 (the "License"); you may not use this file except in compliance with
 the License. You may obtain a copy of the License at

 http://www.apache.org/licenses/LICENSE-2.0

 Unless required by applicable law or agreed to in writing, software
 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="127\.0\.0\.1|::1|0:0:0:0:0:0:0:1" /> -->
  <Manager sessionAttributeValueClassNameFilter="java\.lang\.(?:Boolean|Integer|Long
</Context>
```

vim /opt/tomcat/webapps/manager/META-INF/context.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
Licensed to the Apache Software Foundation (ASF) under one or more
contributor license agreements. See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0
(the "License"); you may not use this file except in compliance with
the License. You may obtain a copy of the License at

    http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software
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="127\.\d+\.\d+\.\d+|::1|0:0:0:0:0:0:0:1" /> -->
  <Manager sessionAttributeValueClassNameFilter="java\.lang\.(?:Boolean|Integer|Long|
</Context>
```

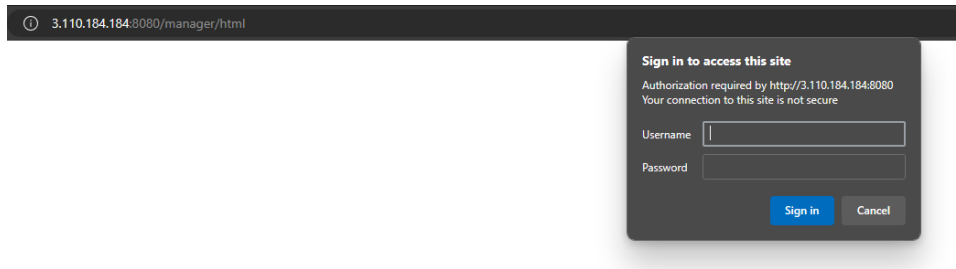
Then no restart tomcat service so first shutdown it ,Then after starting the service.

```
[root@tomcat tomcat]#
[root@tomcat tomcat]# ls
bin BUILDING.txt conf CONTRIBUTING.md lib LICENSE logs NOTICE README.md RELEASE-NOTES RUNNING.txt temp webapps work
[root@tomcat tomcat]# cd bin/
[root@tomcat bin]# ls
bootstrap.jar catalina-tasks.xml commons-daemon.jar configtest.sh digest.sh setclasspath.bat shutdown.sh tomcat-juli.jar
catalina.bat ciphers.bat commons-daemon-native.tar.gz daemon.sh makebase.bat setclasspath.sh startup.bat tomcat-juli.jar
catalina.sh ciphers.sh configtest.bat digest.bat makebase.sh shutdown.bat startup.sh tool
[root@tomcat bin]# ./shutdown.sh
Using CATALINA_BASE:   /opt/tomcat
Using CATALINA_HOME:   /opt/tomcat
Using CATALINA_TMPDIR: /opt/tomcat/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /opt/tomcat/bin/bootstrap.jar:/opt/tomcat/bin/tomcat-juli.jar
NOTE: Picked up JDK_JAVA_OPTIONS:  --add-opens=java.base/java.lang=ALL-UNNAMED --add-opens=java.base/java.io=ALL-UNNAMED --add-opens=java.base/java.util=ALL-UNNAMED --add-opens=java.rmi/sun.rmi.transport=ALL-UNNAMED
[root@tomcat bin]#
[root@tomcat bin]# ./startup.sh
Using CATALINA_BASE:   /opt/tomcat
Using CATALINA_HOME:   /opt/tomcat
Using CATALINA_TMPDIR: /opt/tomcat/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /opt/tomcat/bin/bootstrap.jar:/opt/tomcat/bin/tomcat-juli.jar
Tomcat started.
[root@tomcat bin]#
```

Check on web URL go to manager app.

Now it's asked for credentials. Earlier it's giving error you should not be able to login

That is where again user.xml comes into the picture.



Now we need to create user

vim /opt/tomcat/conf/tomcat-users.xml

```
[root@tomcat tomcat]# find / -name tomcat-users.xml
/opt/tomcat/conf/tomcat-users.xml
[root@tomcat tomcat]#
[root@tomcat tomcat]# vim /opt/tomcat/conf/tomcat-users.xml
[root@tomcat tomcat]#
```

Update users' information in the tomcat-users.xml file goto tomcat home directory and add below users to conf/tomcat-users.xml file

```
<role rolename="manager-gui"/>
<role rolename="manager-script"/>
<role rolename="manager-jmx"/>
<role rolename="manager-status"/>
<user username="admin" password="admin" roles="manager-gui, manager-script, manager-jmx, manager-status"/>
<user username="deployer" password="deployer" roles="manager-script"/>
<user username="tomcat" password="s3cret" roles="manager-gui"/>
```

create link files for tomcat startup.sh and shutdown.sh

ln -s /opt/tomcat/bin/startup.sh /usr/local/bin/tomcatup

ln -s /opt/tomcat/bin/shutdown.sh /usr/local/bin/tomcatdown



```

[root@tomcat tomcat]# ln -s /opt/tomcat/bin/startup.sh /usr/local/bin/tomcatup
[root@tomcat tomcat]# ln -s /opt/tomcat/bin/shutdown.sh /usr/local/bin/tomcatdown
[root@tomcat tomcat]#
[root@tomcat tomcat]# ls
bin BUILDING.txt conf CONTRIBUTING.md lib LICENSE logs NOTICE README.md RELEASE-NOTES RUNNING.txt t
[root@tomcat tomcat]# cd
[root@tomcat ~]# ls -la
total 32
dr-xr-x--- 3 root root 119 May 15 07:59 .
dr-xr-xr-x 18 root root 257 May 15 07:16 ..
-rw-r--r-- 1 root root 18 Oct 18 2017 .bash_logout
-rw-r--r-- 1 root root 176 Oct 18 2017 .bash_profile
-rw-r--r-- 1 root root 176 Oct 18 2017 .bashrc
-rw-r--r-- 1 root root 100 Oct 18 2017 .cshrc
drwx----- 2 root root 29 May 15 07:16 .ssh
-rw-r--r-- 1 root root 129 Oct 18 2017 .tcshrc
-rw----- 1 root root 8489 May 15 07:59 .viminfo
[root@tomcat ~]#
[root@tomcat ~]# ll
total 0
[root@tomcat ~]#
[root@tomcat ~]# tomcatdown
Using CATALINA_BASE: /opt/tomcat
Using CATALINA_HOME: /opt/tomcat
Using CATALINA_TMPDIR: /opt/tomcat/temp
Using JRE_HOME: /usr
Using CLASSPATH: /opt/tomcat/bin/bootstrap.jar:/opt/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
NOTE: Picked up JDK_JAVA_OPTIONS: --add-opens=java.base/java.lang=ALL-UNNAMED --add-opens=java.base/java.io=ALL-UNNAMED --add-opens=java.rmi/sun.rmi.transport=ALL-UNNAMED
[root@tomcat ~]#
[root@tomcat ~]# tomcatup
Using CATALINA_BASE: /opt/tomcat
Using CATALINA_HOME: /opt/tomcat
Using CATALINA_TMPDIR: /opt/tomcat/temp
Using JRE_HOME: /usr
Using CLASSPATH: /opt/tomcat/bin/bootstrap.jar:/opt/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.

```

Enter username password

Now you can able to login successfully in your tomcat server.

Tomcat Web Application Manager

Message: OK

Manager
[List Applications](#)
[HTML Manager Help](#)
[Manager Help](#)
[Server Status](#)

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

Deploy

Deploy directory or WAR file located on server

Context Path:

Version (for parallel deployment):

XML Configuration file path:

WAR or Directory path:

[Deploy](#)

WAR file to deploy

Select WAR file to upload [Choose File](#) No file chosen