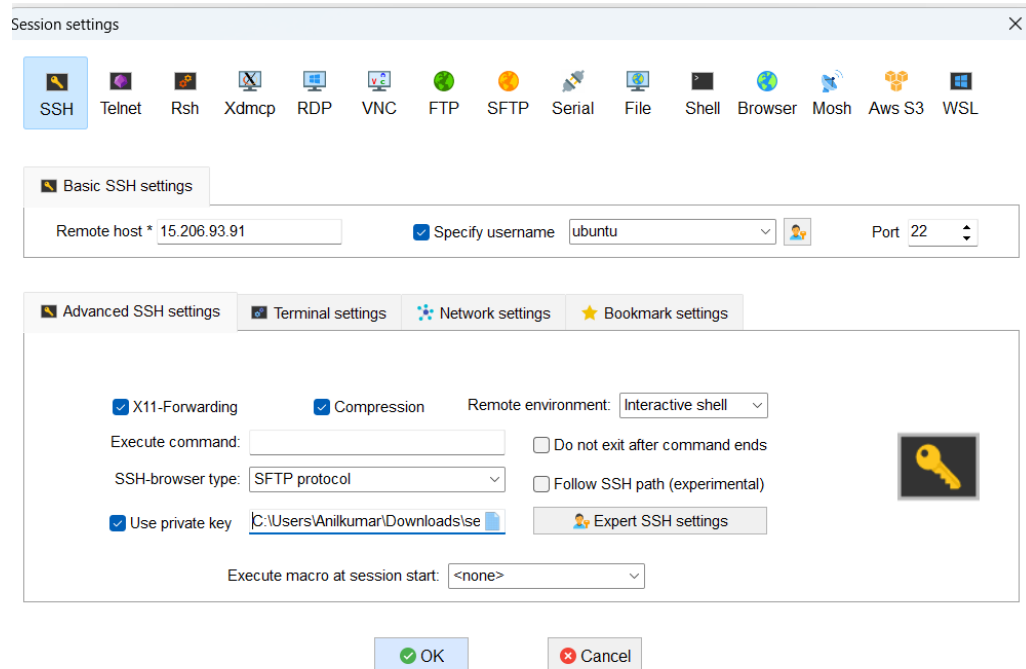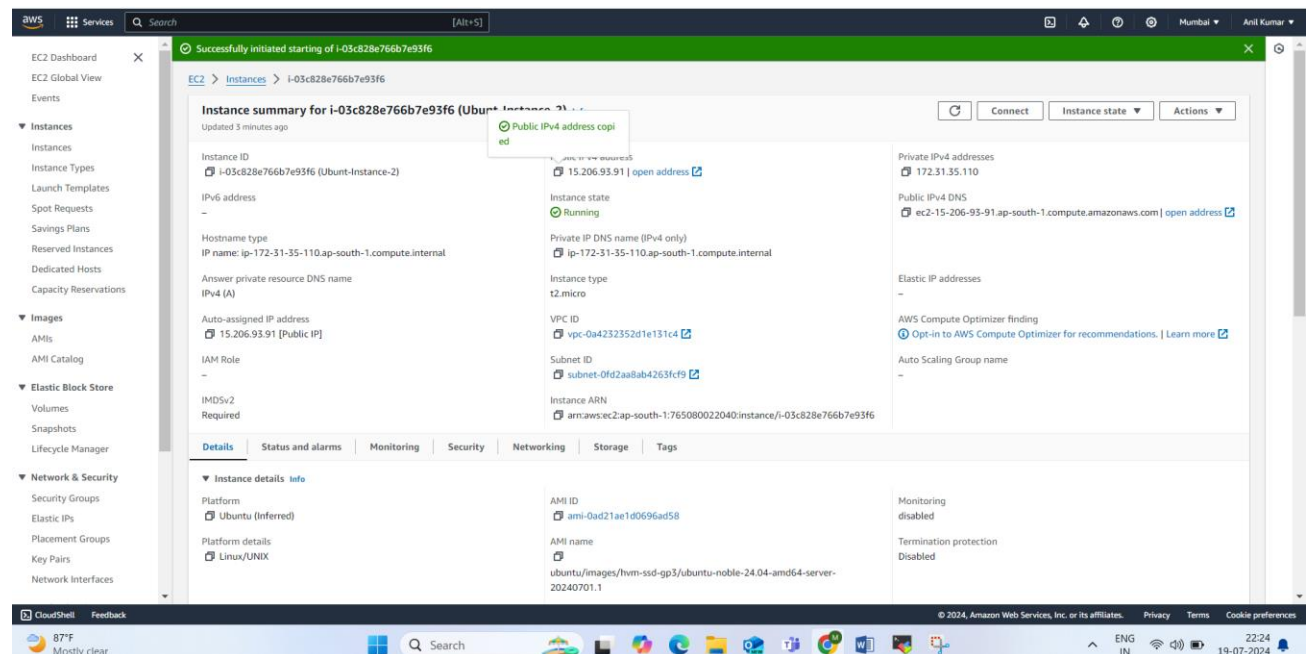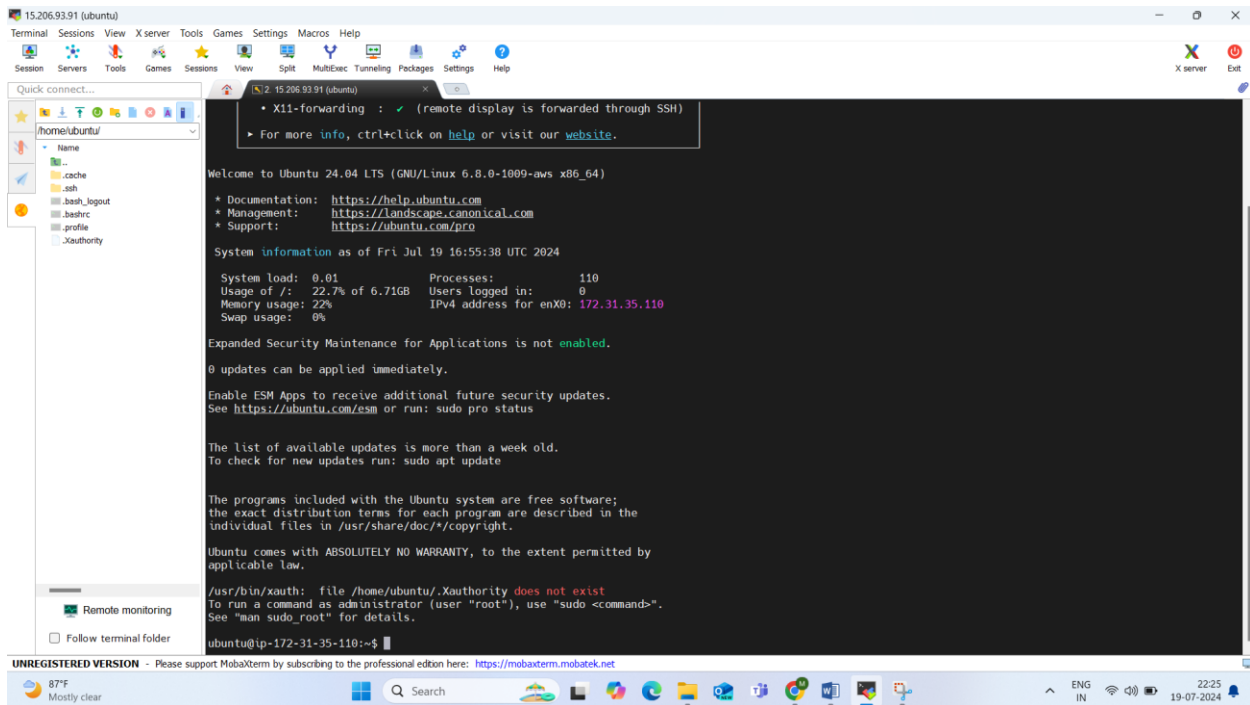# 5. L5 - Install Tomcat web application server in AWS EC2 Ubuntu Instance and access Tomcat using a web browser.

Ans:-

First of all login your credential and aws console.

Steps1:- Create EC2 Ubuntu Instance

Step 2: update and install tomcat in Ubuntu

Make system as root user by command "**sudo -i**"


```
ubuntu@ip-172-31-35-110:~$ sudo -i
root@ip-172-31-35-110:~#
```

Update the system server by command "apt update -y"


```
root@ip-172-31-35-110:~# apt update -y
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
```

Installing the java command "apt update -y"


```
root@ip-172-31-35-110:~# apt-get install openjdk-11-jdk -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
```



```
root@ip-172-31-35-110:~# java -version
openjdk version "11.0.23" 2024-04-16
OpenJDK Runtime Environment (build 11.0.23+9-post-Ubuntu-1ubuntu1)
OpenJDK 64-Bit Server VM (build 11.0.23+9-post-Ubuntu-1ubuntu1, mixed mode, sharing)
root@ip-172-31-35-110:~#
```

Download the tomcat from official website by wget command

wget https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.91/bin/apache-tomcat-9.0.91.tar.gz

```
root@ip-172-31-35-110:~# wget https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.91/bin/apache-tomcat-9.0.91.tar.gz
--2024-07-19 17:08:06--  https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.91/bin/apache-tomcat-9.0.91.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: 11762988 (11M) [application/x-gzip]
Saving to: 'apache-tomcat-9.0.91.tar.gz'

apache-tomcat-9.0.91.tar.gz        100%[===============================================================================>

2024-07-19 17:08:07 (142 MB/s) - 'apache-tomcat-9.0.91.tar.gz' saved [11762988/11762988]

root@ip-172-31-35-110:~#
```

Now extract the tar file by command "tar xvf apache-tomcat-9.0.91.tar.gz"

```
root@ip-172-31-35-110:~# ls
apache-tomcat-9.0.91.tar.gz   snap
root@ip-172-31-35-110:~# tar xvf apache-tomcat-9.0.91.tar.gz
apache-tomcat-9.0.91/conf/
apache-tomcat-9.0.91/conf/catalina.policy
apache-tomcat-9.0.91/conf/catalina.properties
apache-tomcat-9.0.91/conf/context.xml
apache-tomcat-9.0.91/conf/jaspic-providers.xml
```

Now go to "cd apache-tomcat-9.0.91/conf/" and edit the server.xml file and edit port no. as you want to run tomcat in 8080 port no. and save.

```
root@ip-172-31-35-110:~# ls
apache-tomcat-9.0.91   apache-tomcat-9.0.91.tar.gz   snap
root@ip-172-31-35-110:~# cd apache-tomcat-9.0.91/conf/
root@ip-172-31-35-110:~/apache-tomcat-9.0.91/conf# ls
catalina.policy       context.xml           jaspic-providers.xsd   server.xml        tomcat-users.xsd
catalina.properties   jaspic-providers.xml  logging.properties     tomcat-users.xml  web.xml
root@ip-172-31-35-110:~/apache-tomcat-9.0.91/conf#
```

Vi server.xml

```
    Documentation at /docs/config/server.html
  -->
<Server port="8080" shutdown="SHUTDOWN">
  <Listener className="org.apache.catalina.startup.VersionLoggerListener" />
  <!-- Security listener. Documentation at /docs/config/listeners.html
  <Listener className="org.apache.catalina.security.SecurityListener" />
```

Now here in this directory of "conf" edit the "tomcat-users.xml" to give admin rights. And save.

```
root@ip-172-31-35-110:~/apache-tomcat-9.0.91/conf# vi tomcat-users.xml
root@ip-172-31-35-110:~/apache-tomcat-9.0.91/conf# 
```

<role rolename="manager-gui" />
<user username="tomcat" password="tomcat" roles="manager-gui" />
<role rolename="admin-gui" />
<user username="admin" password="admin" roles="manager-gui,admin-gui"/>
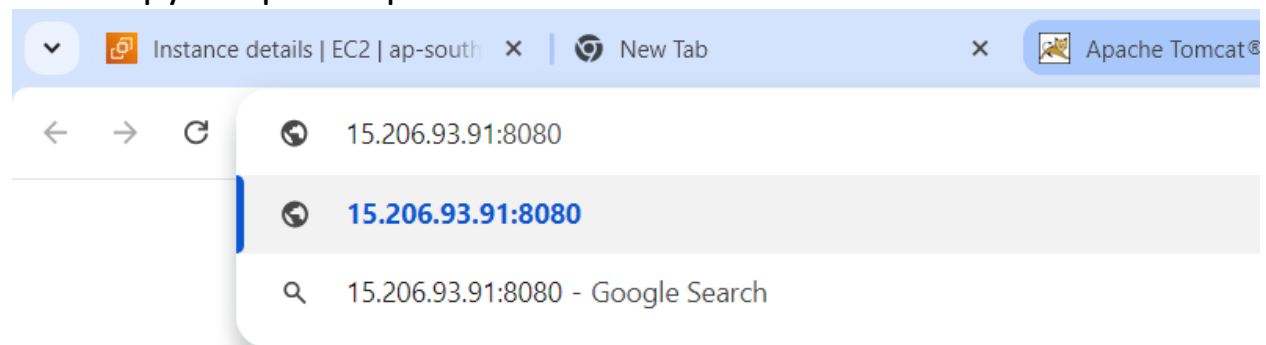
```
<!--
  <role rolename="tomcat"/>
  <role rolename="role1"/>
  <user username="tomcat" password="<must-be-changed>" roles="tomcat"/>
  <user username="both" password="<must-be-changed>" roles="tomcat,role1"/>
  <user username="role1" password="<must-be-changed>" roles="role1"/>
-->
<role rolename="manager-gui" />
<user username="tomcat" password="tomcat" roles="manager-gui" />
<role rolename="admin-gui" />
<user username="admin" password="admin" roles="manager-gui,admin-gui"/>

</tomcat-users>
"tomcat-users.xml" 61L, 2956B
```

Now go to previous directory
Cd ..

```
root@ip-172-31-35-110:~/apache-tomcat-9.0.91/conf# cd ..
root@ip-172-31-35-110:~/apache-tomcat-9.0.91# 
```

No go to cd webapps/manager/META-INF/ and edit contex.xml file to add permission

```
root@ip-172-31-35-110:~/apache-tomcat-9.0.91# ls
BUILDING.txt  CONTRIBUTING.md  LICENSE  NOTICE  README.md  RELEASE-NOTES  RUNNING.txt  bin  conf  lib  logs  temp  webapps  work
root@ip-172-31-35-110:~/apache-tomcat-9.0.91# cd webapps/manager/META-INF/
root@ip-172-31-35-110:~/apache-tomcat-9.0.91/webapps/manager/META-INF# ls
context.xml
root@ip-172-31-35-110:~/apache-tomcat-9.0.91/webapps/manager/META-INF# vi context.xml 
```

```
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|Lo
che(?:\$1)?|java\.util\.(?:Linked)?HashMap"/>
```

To
<Valve className="org.apache.catalina.valves.RemoteAddrValve"
    allow=".*" />

```
<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
ache(?:\$1)?|java\.util\.(?:Linked)?HashMap"/>
</Context>
```

Now again go to bin directory to start stop and start the tomcat

cd ../../..

cd bin/
./shutdown.sh
./startup.sh

```
root@ip-172-31-35-110:~/apache-tomcat-9.0.91/bin# ./startup.sh
Using CATALINA_BASE:   /root/apache-tomcat-9.0.91
Using CATALINA_HOME:   /root/apache-tomcat-9.0.91
Using CATALINA_TMPDIR: /root/apache-tomcat-9.0.91/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /root/apache-tomcat-9.0.91/bin/bootstrap.jar:/root/apache-tomcat-9.0
Using CATALINA_OPTS:
Tomcat started.
root@ip-172-31-35-110:~/apache-tomcat-9.0.91/bin#
```

Now copy the public ip of instance:8080 in chrom brouser

Instance details | EC2 | ap-south   × | New Tab   ×   Apache Tomcat®

← → C   15.206.93.91:8080

      15.206.93.91:8080

      15.206.93.91:8080 - Google Search

Go to server status ad type credential

Server Status

Manager			
List Applications	HTML Manager Help	Manager Help	Complete Server Status

Server Information							
Tomcat Version	JVM Version	JVM Vendor	OS Name	OS Version	OS Architecture	Hostname	IP Address
Apache Tomcat/9.0.91	11.0.23+9-post-Ubuntu-1ubuntu1	Ubuntu	Linux	6.8.0-1009-aws	amd64	ip-172-31-45-226	172.31.45.226

JVM

Free Memory: 11.64 MiB Total Memory: 25.51 MiB Max Memory: 232.00 MiB

Memory Pool	Type	Initial	Total	Maximum	Used
Eden Space	Heap memory	4.31 MiB	7.06 MiB	64.00 MiB	3.32 MiB (5%)
Survivor Space	Heap memory	0.50 MiB	0.87 MiB	8.00 MiB	0.00 MiB (0%)
Tenured Gen	Heap memory	10.68 MiB	17.57 MiB	160.00 MiB	10.54 MiB (6%)
CodeHeap 'non-nmethods'	Non-heap memory	2.43 MiB	2.43 MiB	5.55 MiB	1.21 MiB (21%)
CodeHeap 'non-profiled nmethods'	Non-heap memory	2.43 MiB	2.43 MiB	117.22 MiB	1.14 MiB (0%)
CodeHeap 'profiled nmethods'	Non-heap memory	2.43 MiB	6.37 MiB	117.21 MiB	6.32 MiB (5%)
Compressed Class Space	Non-heap memory	0.00 MiB	2.25 MiB	1024.00 MiB	1.91 MiB (0%)
Metaspace	Non-heap memory	0.00 MiB	19.00 MiB	-0.00 MiB	18.14 MiB

"http-nio-8080"

Max threads: 200 Current thread count: 10 Current threads busy: 1 Keep alive sockets count: 1
Max processing time: 502 ms Processing time: 0.589 s Request count: 12 Error count: 3 Bytes received: 0.00 MiB Bytes sent: 0.07 MiB

Go to list of application

Message:	OK - Undeployed application at context path [/01-Maven-WebApp-StarAgile]

Manager			
List Applications	HTML Manager Help	Manager Help	Server Status

Applications					
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	

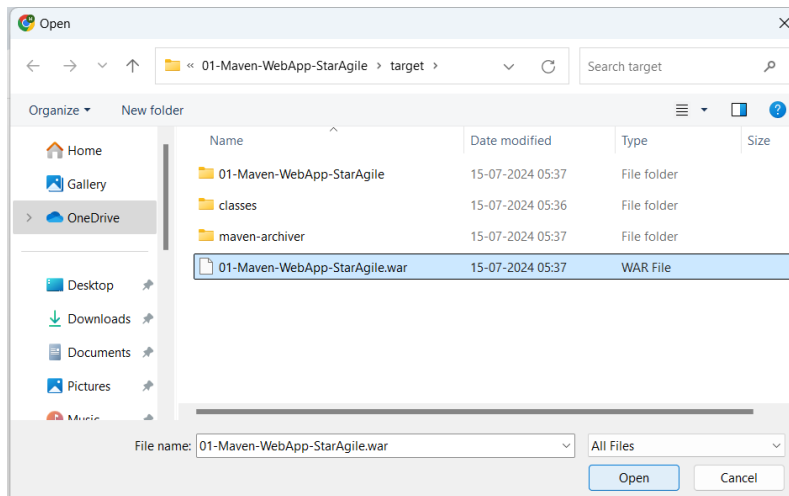No go to war file to deploy → choose file and deploy

WAR file to deploy

Select WAR file to upload   Choose File   No file chosen

Deploy

Applications

Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy / Expire sessions with idle ≥ 30 minutes
/01-Maven-WebApp-StarAgile	None specified	Archetype Created Web Application	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

Finally you can get desired output

http://15.206.93.91:8080/01-Maven-WebApp-StarAgile/

Hello World!