

Apache Tomcat

Prerequisites

Amazon Linux Machine with a minimum of 2GB RAM.

Needs to open 8080 on EC2 Security Group (8080 for Tomcat Default Port).

Steps to install and configure Tomcat

Install Java on Machine

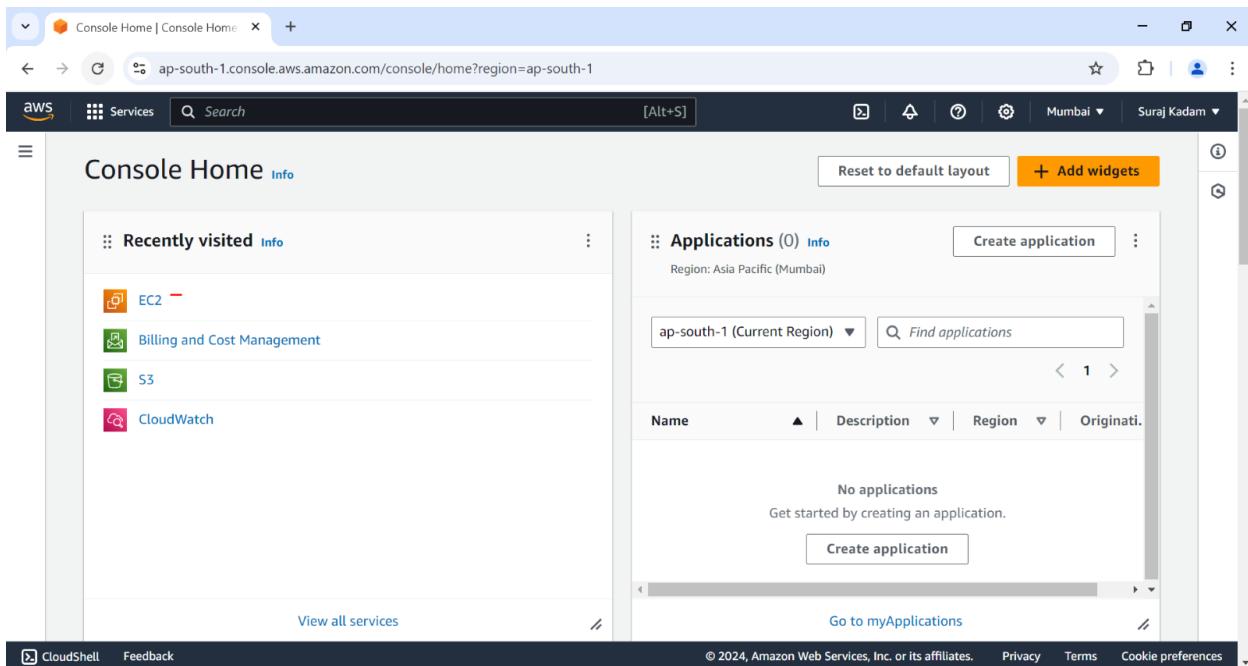
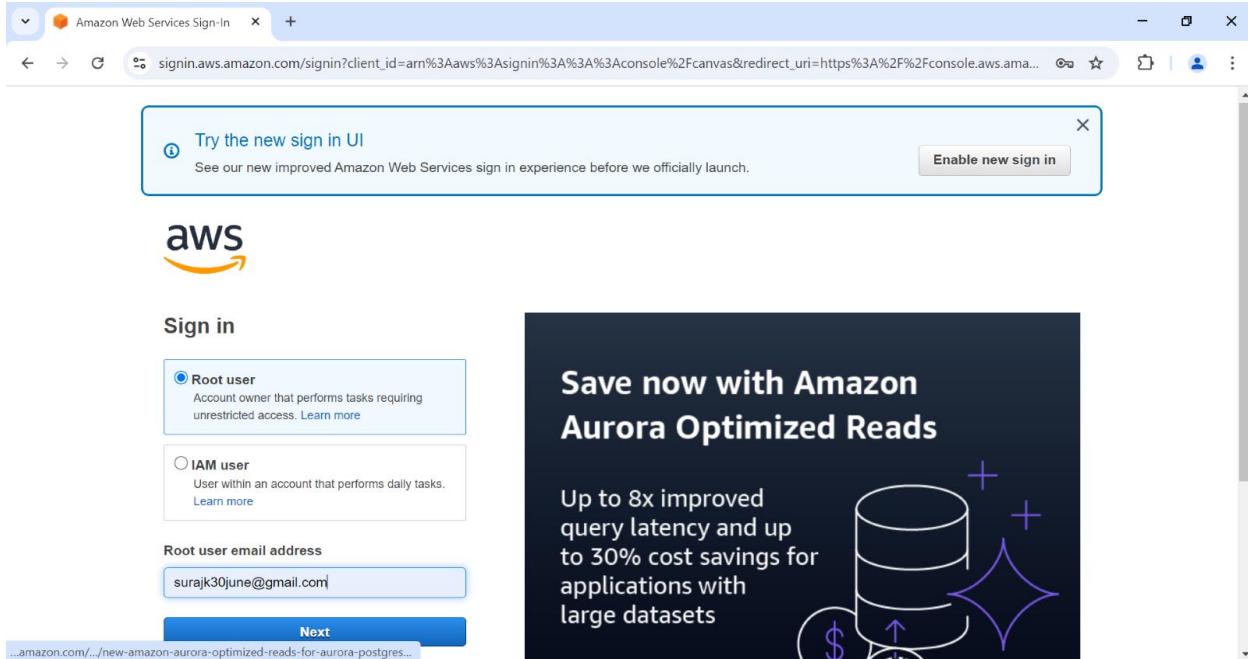
Install Tomcat on Machine

Add Execute Permission to startup.sh & shutdown.sh

Create link files for Tomcat Server up and Down

Change Settings to Manage Tomcat, Update user information in tomcat-users.xml

Step 1: Login into your AWS cloud account and navigate to EC2 service

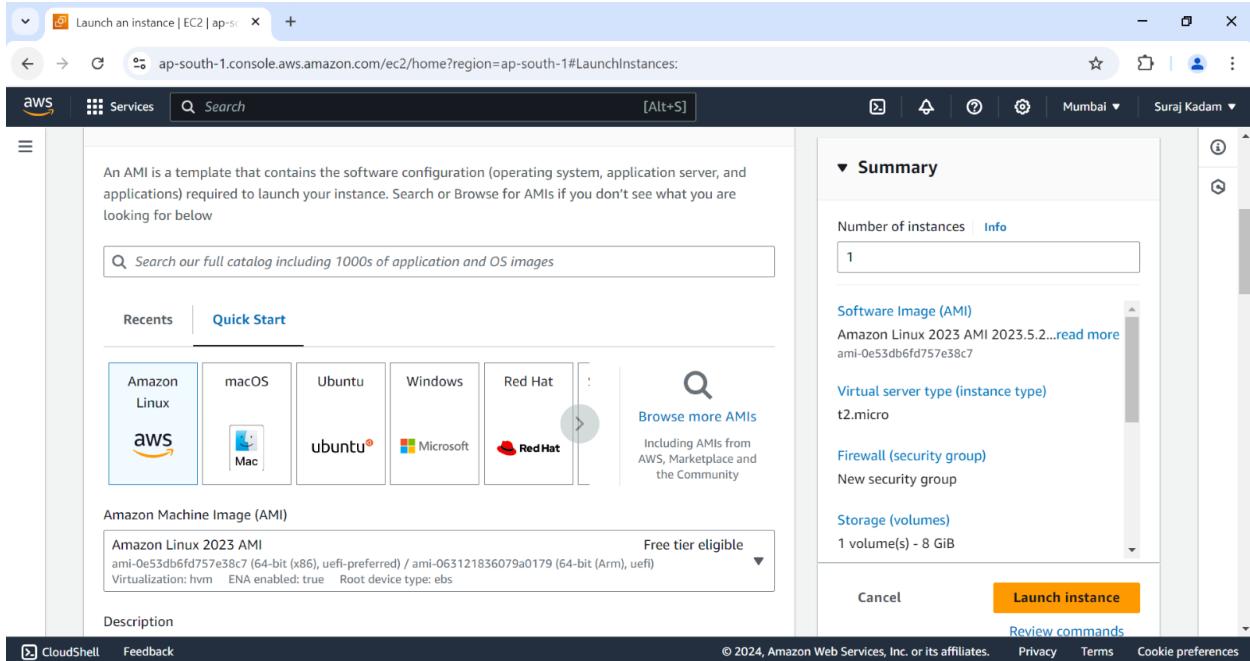


Step 2: Click on Launch Instance.

The screenshot shows the AWS EC2 Dashboard. On the left, there's a sidebar with various EC2-related options like Instances, Images, and Capacity. The main area has sections for Elastic IPs, Key pairs, Placement groups, and Snapshots on the left, and Instances, Load balancers, Security groups, and Volumes on the right. In the center, there's a large 'Launch instance' button with a callout bubble pointing to it. To the right, there's a 'Service health' section showing 'This service is operating normally.' At the bottom right, there's a summary of usage statistics.

Step-3: Give name for instance and select AMI

The screenshot shows the 'Launch an instance' wizard. It's on the first step, 'Launch an instance'. The left side has two sections: 'Name and tags' where the name 'Tomcat_Server' is entered, and 'Application and OS Images (Amazon Machine Image)' which describes what an AMI is. The right side is the 'Summary' section where you can set the number of instances (1), choose the software image (Amazon Linux 2023.5.2...), select the virtual server type (t2.micro), and choose a firewall and storage. At the bottom right is a large 'Launch instance' button.

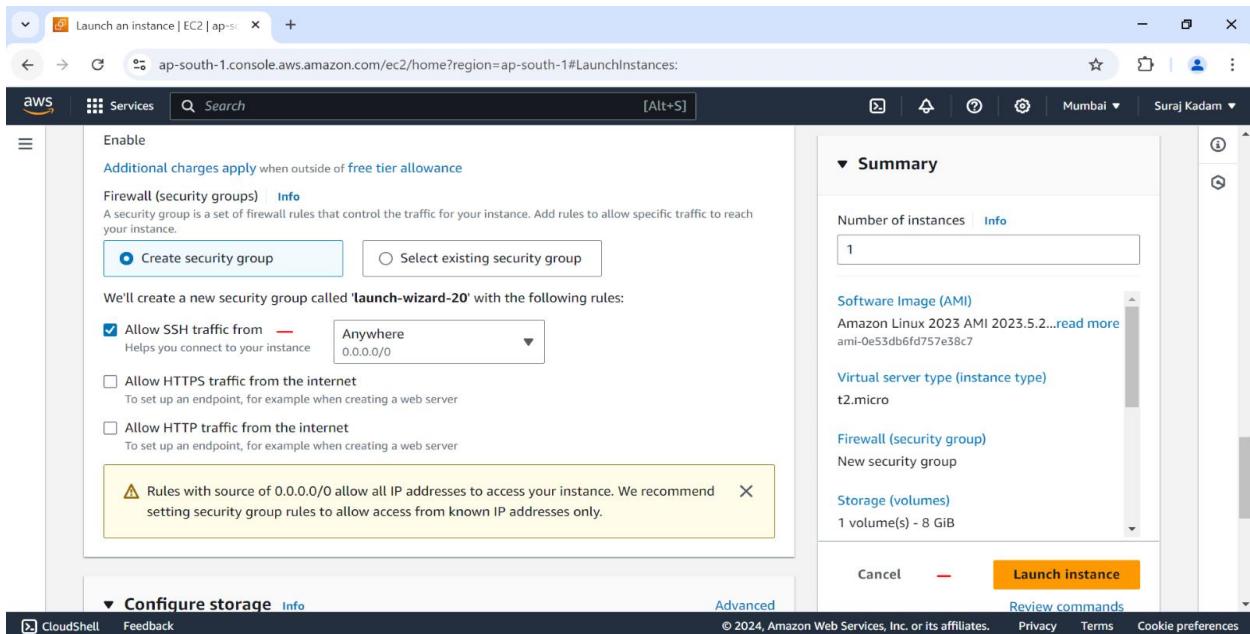


Step -4: Keep instance type as t2.mico and select Key Pair

Note: If Key pair not available, create new pair and select it.

(When we create a new key pair, it will download .pem file. Keep it safe. We need that .pem file to connect with the Machine using SSH)

Step -5: Select Security group Settings to allow SSH traffic and click on 'Launch Instance'



Step -6: Once instance got created then click on Instance id which is showing like below

Success
Successfully initiated launch of instance [i-097d2fef27e295122]

Next Steps

Create billing and free tier usage alerts
To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.

Connect to your instance
Once your instance is running, log into it from your local computer.
Connect to instance

Connect an RDS database
Configure the connection between an EC2 instance and a database to allow traffic flow between them.
Connect an RDS database

Create EBS snapshot policy
Create a policy that automates the creation, retention, and deletion of EBS snapshots

Step - 7: Select Instance name checkbox and see Public IP of instance

Name	Instance ID	Instance state	Instance type	Status check
Jenkins_Server	i-097d2fef27e295122	Stopped	t2.micro	-
<input checked="" type="checkbox"/> Tomcat_Server	i-0ac9f984d19b0f4d1	Running	t2.micro	Initializing

i-0ac9f984d19b0f4d1 (Tomcat_Server)

Details	Status and alarms	Monitoring	Security	Networking	Storage	Tags
Instance ID i-0ac9f984d19b0f4d1 (Tomcat_Server)	Public IPv4 address 13.232.208.251 open address	Private IPv4 addresses 172.31.9.202				
IPv6 address -	Instance state Running	Public IPv4 DNS ec2-13-232-208-251.ap-south-				

Step -8: Click on connect button and connect to Jenkins VM

Apache Tomcat

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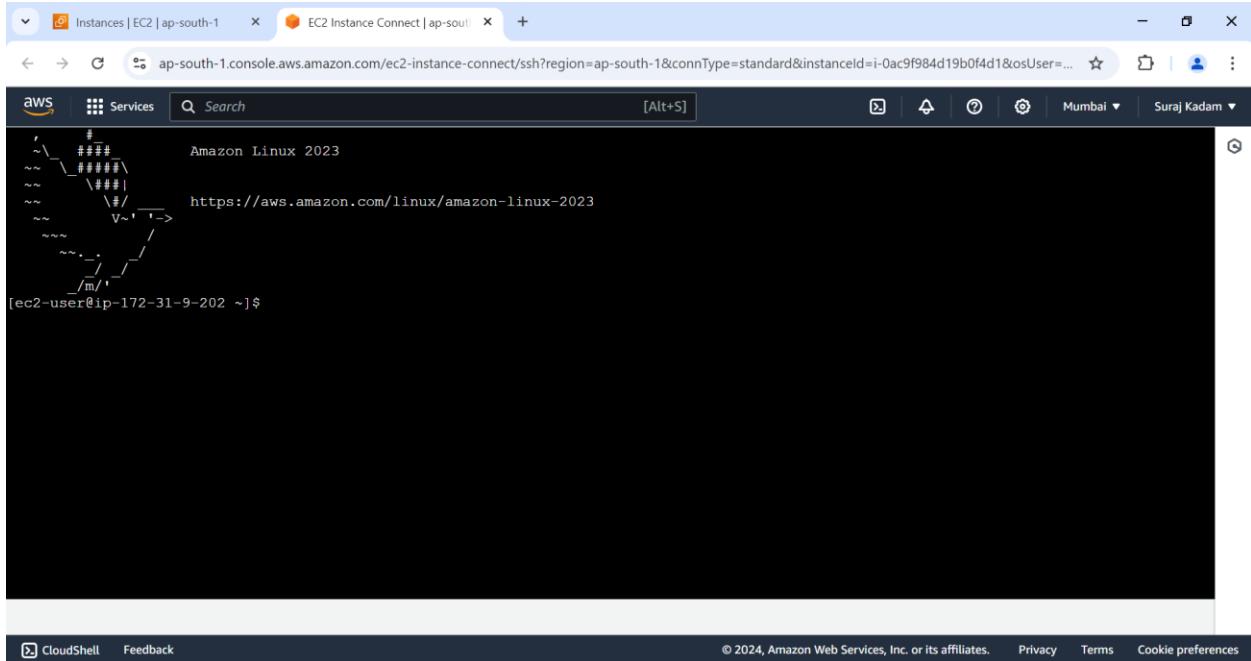
The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with options like EC2 Dashboard, EC2 Global View, Events, Instances (with sub-options like Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations), and Images (AMIs, AMI Catalog). The main area displays a table of instances:

Name	Instance ID	Instance state	Instance type	Status check
Jenkins_Server	i-097d2fef27e295122	Stopped	t2.micro	-
Tomcat_Server	i-0ac9f984d19b0f4d1	Running	t2.micro	Initializing

Below the table, a modal window is open for the Tomcat_Server instance, titled "i-0ac9f984d19b0f4d1 (Tomcat_Server)". It has tabs for Details, Status and alarms, Monitoring, Security, Networking, Storage, and Tags. Under the Details tab, it shows the Instance ID (i-0ac9f984d19b0f4d1), Public IPv4 address (13.232.208.251), Private IPv4 addresses (172.31.9.202), Instance state (Running), and Public IPv4 DNS (ec2-13-232-208-251.ap-south-1.compute.amazonaws.com).

The screenshot shows the "Connect to instance" dialog for the Tomcat_Server instance. It asks for a connection type: "Connect using EC2 Instance Connect" (selected) or "Connect using EC2 Instance Connect Endpoint". It also asks for a public IP address (13.232.208.251) and a username (ec2-user). A note at the bottom says: "Note: In most cases, the default username, ec2-user, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username." At the bottom are "Cancel" and "Connect" buttons.

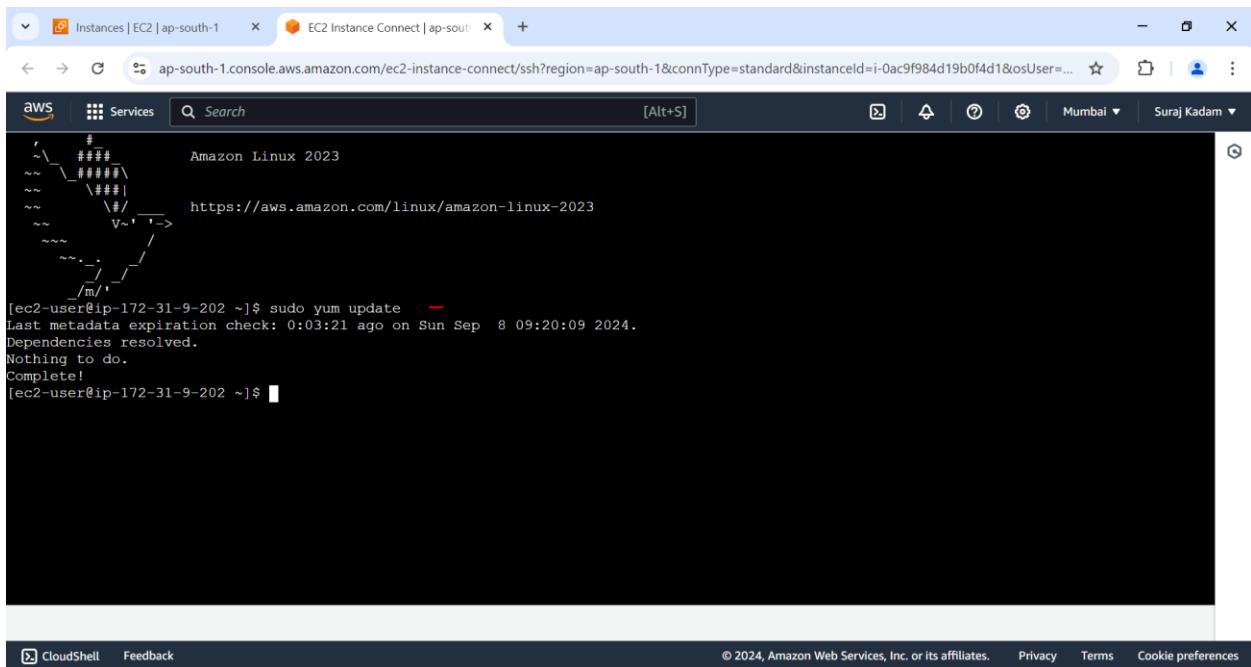
Note: After successful connection with Virtual Machin, we can see below terminal



```
[ec2-user@ip-172-31-9-202 ~]$
```

Step -9: Update Packages using the command below.

```
$ sudo yum update
```



```
Last metadata expiration check: 0:03:21 ago on Sun Sep  8 09:20:09 2024.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-172-31-9-202 ~]$
```

Step- 10: Check Java Version

```
$ java --version
```

```

Amazon Linux 2023
https://aws.amazon.com/linux/amazon-linux-2023

[ec2-user@ip-172-31-10-54 ~]$ sudo yum update
Last metadata expiration check: 0:04:39 ago on Sun Sep  8 07:41:30 2024.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-172-31-10-54 ~]$ java --version
-bash: java: command not found
[ec2-user@ip-172-31-10-54 ~]$

```

Step -11: Install Java using Below command we required jdk version 17

`$ sudo dnf install java-17-amazon-corretto -y`

```

[ec2-user@ip-172-31-10-54 ~]$ java --version
-bash: java: command not found
[ec2-user@ip-172-31-10-54 ~]$ sudo dnf install java-17-amazon-corretto -y
Last metadata expiration check: 0:07:29 ago on Sun Sep  8 07:41:30 2024.
Dependencies resolved.

Transaction Summary
  Installing: java-17-amazon-corretto.x86_64 1:17.0.12+7-1.amzn2023.1
  Installing dependencies:
    alsa-lib.x86_64 1:2.7.2-1.amzn2023.0.2
    cairo.x86_64 1:17.6-2.amzn2023.0.1
    dejavu-sans-fonts.noarch 2.37-16.amzn2023.0.2
    dejavu-sans-mono-fonts.noarch 2.37-16.amzn2023.0.2
    dejavu-serif-fonts.noarch 2.37-16.amzn2023.0.2
    fontconfig.x86_64 2:13.94-2.amzn2023.0.2
    fonts-filesystem.noarch 1:2.0.5-12.amzn2023.0.2
    freetype.x86_64 2:13.2-5.amzn2023.0.1
    giflib.x86_64 5.2.1-9.amzn2023.0.1
    google-noto-fonts-common.noarch 20201206-2.amzn2023.0.2
    google-noto-sans-vf-fonts.noarch 20201206-2.amzn2023.0.2
    graphite2.x86_64 1.3.14-7.amzn2023.0.2
    harfbuzz.x86_64 7.0.0-2.amzn2023.0.1
    java-17-amazon-corretto-headless.x86_64 1:17.0.12+7-1.amzn2023.1
    javapackages-filesystem.noarch 6.0.0-7.amzn2023.0.6
    langpacks-core-font-en.noarch 3.0-21.amzn2023.0.4
    libICE.x86_64 1.0.10-6.amzn2023.0.2

```

Step -12: Verify Java Version

```

Verifying : xml-common-0.6.3-56.amzn2023.0.2.noarch
Installed:
alsa-lib-1.2.7.2-1.amzn2023.0.2.x86_64
dejavu-sans-fonts-2.37-16.amzn2023.0.2.noarch
dejavu-serif-fonts-2.37-16.amzn2023.0.2.noarch
fonts-filigesystem-2.0.5-12.amzn2023.0.2.noarch
glib2-5.2.1-9.amzn2023.0.1.x86_64
google-noto-sans-vf-fonts-20201206-2.amzn2023.0.2.noarch
harfbuzz-7.0.0-2.amzn2023.0.1.x86_64
java-17-amazon-corretto-headless-1:17.0.12+7-1.amzn2023.1.x86_64
langpacks-core-font-en-3.0-21.amzn2023.0.4.noarch
libSM-1.2.3-8.amzn2023.0.2.x86_64
libX11-common-1.7.2-3.amzn2023.0.4.noarch
libXext-1.3.4-6.amzn2023.0.2.x86_64
libXinerama-1.1.4-8.amzn2023.0.2.x86_64
libXrender-0.9.10-14.amzn2023.0.2.x86_64
libXtst-1.2.3-14.amzn2023.0.2.x86_64
libjpeg-turbo-2.1.4-2.amzn2023.0.5.x86_64
libxcb-1.13.1-7.amzn2023.0.2.x86_64
xml-common-0.6.3-56.amzn2023.0.2.noarch

cairo-1.17.6-2.amzn2023.0.1.x86_64
dejavu-sans-mono-fonts-2.37-16.amzn2023.0.2.noarch
fontconfig-2.13.94-2.amzn2023.0.2.x86_64
freetype-2.13.2-5.amzn2023.0.1.x86_64
google-noto-fonts-common-20201206-2.amzn2023.0.2.noarch
graphite2-1.3.14-7.amzn2023.0.2.x86_64
java-17-amazon-corretto-1:17.0.12+7-1.amzn2023.1.x86_64
javapackages-filesystem-6.0.0-7.amzn2023.0.6.noarch
libICE-1.0.10-6.amzn2023.0.2.x86_64
libX11-1.7.2-3.amzn2023.0.4.x86_64
libXau-1.0.9-6.amzn2023.0.2.x86_64
libXi-1.7.10-6.amzn2023.0.2.x86_64
libXrandr-1.5.2-6.amzn2023.0.2.x86_64
libXt-1.2.0-4.amzn2023.0.2.x86_64
libbrotli-1.0.9-4.amzn2023.0.2.x86_64
libpng-2:1.6.37-10.amzn2023.0.6.x86_64
pixman-0.40.0-3.amzn2023.0.3.x86_64

Complete!
[ec2-user@ip-172-31-10-54 ~]$ java --version --
openjdk 17.0.12 2024-07-16 LTS
OpenJDK Runtime Environment Corretto-17.0.12.7.1 (build 17.0.12+7-LTS)
OpenJDK 64-Bit Server VM Corretto-17.0.12.7.1 (build 17.0.12+7-LTS, mixed mode, sharing)
[ec2-user@ip-172-31-10-54 ~]$ 
```

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Step -13: We need to download the wget package to download use below command.

```
$ sudo yum install wget
```

```

Amazon Linux 2023
https://aws.amazon.com/linux/amazon-linux-2023

[ec2-user@ip-172-31-9-202 ~]$ sudo yum update
Last metadata expiration check: 0:03:21 ago on Sun Sep  8 09:20:09 2024.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-172-31-9-202 ~]$ sudo yum install wget
Last metadata expiration check: 0:05:23 ago on Sun Sep  8 09:20:09 2024.
Package wget-1.21.3-1.amzn2023.0.4.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-172-31-9-202 ~]$ 
```

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Step -14: Add Apache tomcat to repository by executing the commands below.

```
$ wget https://archive.apache.org/dist/tomcat/tomcat-10/v10.0.23/bin/apache-tomcat-10.0.23.tar.gz
```

Apache Tomcat

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ls -ltr

[ec2-user@ip-172-31-9-202 ~]\$ sudo yum update
Last metadata expiration check: 0:03:21 ago on Sun Sep 8 09:20:09 2024.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-172-31-9-202 ~]\$ sudo yum install wget
Last metadata expiration check: 0:05:23 ago on Sun Sep 8 09:20:09 2024.
Package wget-1.21.3-1.amzn2023.0.4.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-172-31-9-202 ~]\$ wget https://archive.apache.org/dist/tomcat/tomcat-10/v10.0.23/bin/apache-tomcat-10.0.23.tar.gz --2024-09-08 09:39:38-- https://archive.apache.org/dist/tomcat/tomcat-10/v10.0.23/bin/apache-tomcat-10.0.23.tar.gz
Resolving archive.apache.org (archive.apache.org) ... 65.108.204.189, 2a01:4f9:1a:a084::2
Connecting to archive.apache.org (archive.apache.org)|65.108.204.189|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11972768 (11M) [application/x-gzip]
Saving to: 'apache-tomcat-10.0.23.tar.gz'

apache-tomcat-10.0.23.tar.gz 100%[=====] 11.42M 5.23MB/s in 2.2s
2024-09-08 09:39:41 (5.23 MB/s) - 'apache-tomcat-10.0.23.tar.gz' saved [11972768/11972768]
[ec2-user@ip-172-31-9-202 ~]\$ ls -ltr
total 11968
-rw-r--r--. 1 ec2-user ec2-user 11972768 Jul 14 2022 apache-tomcat-10.0.23.tar.gz --

Step -15: Untar the apache-tomcat-10.0.23.tar.gz package using the command below.

```
$ sudo tar -xvf apache-tomcat-10*.tar.gz
```

The screenshot shows a terminal window within the AWS CloudShell interface. The user has run the command `curl https://archive.apache.org/dist/tomcat/tomcat-10/v10.0.23/bin/apache-tomcat-10.0.23.tar.gz` to download the tarball. They then extract it with `tar -xvf apache-tomcat-10*.tar.gz`. The terminal output shows the progress of the download and the extraction process.

```
--2024-09-08 09:39:38-- https://archive.apache.org/dist/tomcat/tomcat-10/v10.0.23/bin/apache-tomcat-10.0.23.tar.gz
Resolving archive.apache.org (archive.apache.org)... 65.108.204.189, 2a01:4f9:1:a084::2
Connecting to archive.apache.org (archive.apache.org)|65.108.204.189|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11972768 (11M) [application/x-gzip]
Saving to: 'apache-tomcat-10.0.23.tar.gz'

apache-tomcat-10.0.23.tar.gz      100%[=====] 11.42M  5.23MB/s   in 2.2s

2024-09-08 09:39:41 (5.23 MB/s) - 'apache-tomcat-10.0.23.tar.gz' saved [11972768/11972768]

[ec2-user@ip-172-31-9-202 ~]$ ls -ltr
total 11696
-rw-r--r--. 1 ec2-user ec2-user 11972768 Jul 14 2022 apache-tomcat-10.0.23.tar.gz
[ec2-user@ip-172-31-9-202 ~]$ sudo tar -xvf apache-tomcat-10*.tar.gz --
apache-tomcat-10.0.23/conf/
apache-tomcat-10.0.23/conf/catalina.policy
apache-tomcat-10.0.23/conf/catalina.properties
apache-tomcat-10.0.23/conf/context.xml
apache-tomcat-10.0.23/conf/jaspic-providers.xml
apache-tomcat-10.0.23/conf/jaspic-providers.xsd
apache-tomcat-10.0.23/conf/logging.properties
apache-tomcat-10.0.23/conf/server.xml
apache-tomcat-10.0.23/conf/tomcat-users.xml
apache-tomcat-10.0.23/conf/tomcat-users.xsd
apache-tomcat-10.0.23/conf/web.xml
apache-tomcat-10.0.23/bin/
apache-tomcat-10.0.23/lib/
```

Rename the untared file to apache-tomcat.

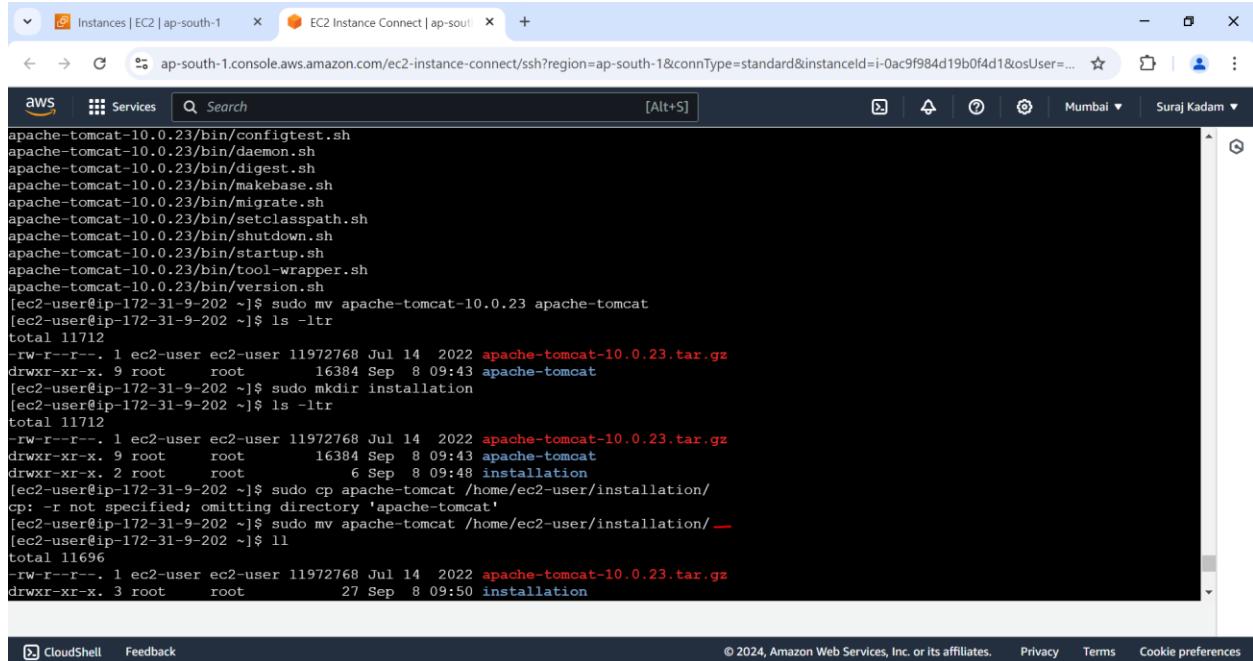
\$ sudo mv apache-tomcat-10.0.23 apache-tomcat

The screenshot shows the terminal window again. The user has run the command `sudo mv apache-tomcat-10.0.23 apache-tomcat` to rename the directory. They then verify the change with `ls -l` and check the file permissions with `ls -l apache-tomcat`.

```
apache-tomcat-10.0.23/webapps/manager/WEB-INF/jsp/connectorTrustedCerts.jsp
apache-tomcat-10.0.23/webapps/manager/WEB-INF/jsp/sessionDetail.jsp
apache-tomcat-10.0.23/webapps/manager/WEB-INF/jsp/sessionsList.jsp
apache-tomcat-10.0.23/webapps/manager/WEB-INF/web.xml
apache-tomcat-10.0.23/webapps/manager/css/manager.css
apache-tomcat-10.0.23/webapps/manager/images/asf-logo.svg
apache-tomcat-10.0.23/webapps/manager/images/tomcat.svg
apache-tomcat-10.0.23/webapps/manager/index.jsp
apache-tomcat-10.0.23/webapps/manager/status.xsd
apache-tomcat-10.0.23/webapps/manager/xform.xsl
apache-tomcat-10.0.23/bin/catalina.sh
apache-tomcat-10.0.23/bin/ciphers.sh
apache-tomcat-10.0.23/bin/configtest.sh
apache-tomcat-10.0.23/bin/daemon.sh
apache-tomcat-10.0.23/bin/digest.sh
apache-tomcat-10.0.23/bin/makebase.sh
apache-tomcat-10.0.23/bin/migrate.sh
apache-tomcat-10.0.23/bin/setclasspath.sh
apache-tomcat-10.0.23/bin/shutdown.sh
apache-tomcat-10.0.23/bin/startup.sh
apache-tomcat-10.0.23/bin/tool-wrapper.sh
apache-tomcat-10.0.23/bin/version.sh
[ec2-user@ip-172-31-9-202 ~]$ sudo mv apache-tomcat-10.0.23 apache-tomcat --
[ec2-user@ip-172-31-9-202 ~]$ ls -l
total 11712
-rw-r--r--. 1 ec2-user ec2-user 11972768 Jul 14 2022 apache-tomcat-10.0.23.tar.gz
drwxr-xr-x. 9 root    root     16384 Sep  8 09:43 apache-tomcat
[ec2-user@ip-172-31-9-202 ~]$
```

Step -16: Create a directory named installation and move the Apache tomcat package into the directory.

\$ sudo mv apache-tomcat /home/ec2-user/installation/



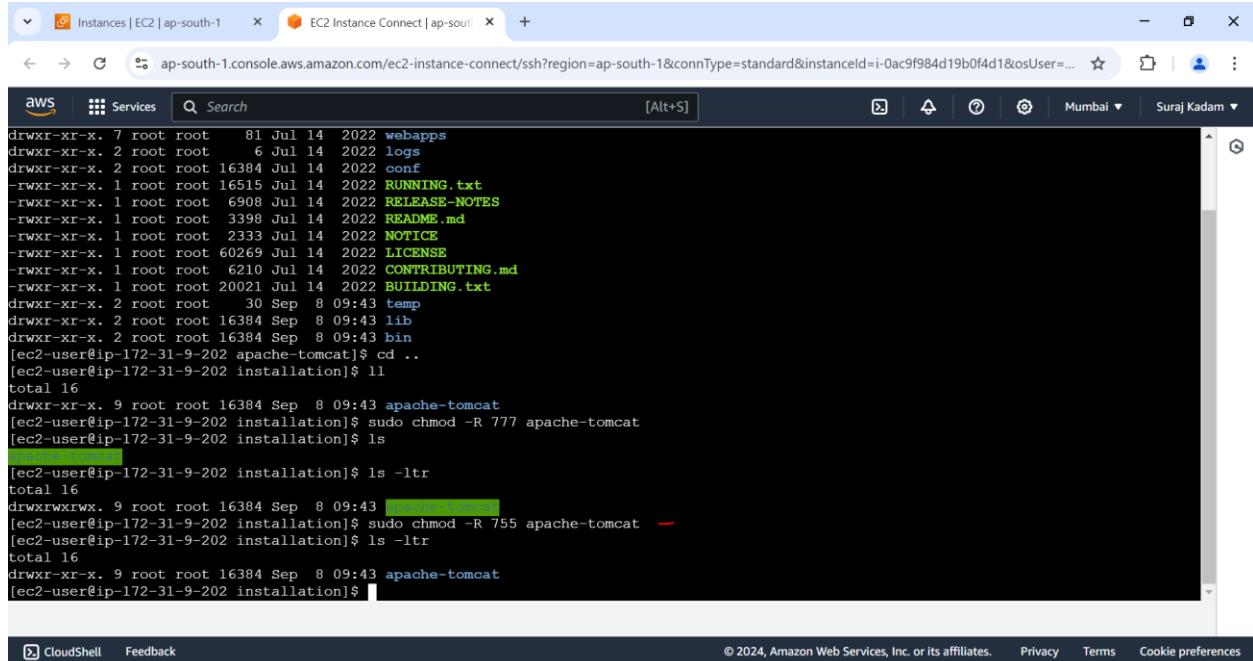
```

apache-tomcat-10.0.23/bin/configtest.sh
apache-tomcat-10.0.23/bin/daemon.sh
apache-tomcat-10.0.23/bin/digest.sh
apache-tomcat-10.0.23/bin/makebase.sh
apache-tomcat-10.0.23/bin/migrate.sh
apache-tomcat-10.0.23/bin/setclasspath.sh
apache-tomcat-10.0.23/bin/shutdown.sh
apache-tomcat-10.0.23/bin/startup.sh
apache-tomcat-10.0.23/bin/tool-wrapper.sh
apache-tomcat-10.0.23/bin/version.sh
[ec2-user@ip-172-31-9-202 ~]$ sudo mv apache-tomcat-10.0.23 apache-tomcat
[ec2-user@ip-172-31-9-202 ~]$ ls -ltr
total 11712
-rw-r--r--. 1 ec2-user ec2-user 11972768 Jul 14 2022 apache-tomcat-10.0.23.tar.gz
drwxr-xr-x. 9 root root 16384 Sep 8 09:43 apache-tomcat
[ec2-user@ip-172-31-9-202 ~]$ sudo mkdir installation
[ec2-user@ip-172-31-9-202 ~]$ ls -ltr
total 11712
-rw-r--r--. 1 ec2-user ec2-user 11972768 Jul 14 2022 apache-tomcat-10.0.23.tar.gz
drwxr-xr-x. 9 root root 16384 Sep 8 09:43 apache-tomcat
drwxr-xr-x. 2 root root 6 Sep 8 09:48 installation
[ec2-user@ip-172-31-9-202 ~]$ sudo cp apache-tomcat /home/ec2-user/installation/
cp: - not specified; omitting directory 'apache-tomcat'
[ec2-user@ip-172-31-9-202 ~]$ sudo mv apache-tomcat /home/ec2-user/installation/ --
[ec2-user@ip-172-31-9-202 ~]$ ls
total 11696
-rw-r--r--. 1 ec2-user ec2-user 11972768 Jul 14 2022 apache-tomcat-10.0.23.tar.gz
drwxr-xr-x. 3 root root 27 Sep 8 09:50 installation

```

Add Permission to apache-tomcat using the command below.

`$ sudo chmod -R 755 apache-tomcat`



```

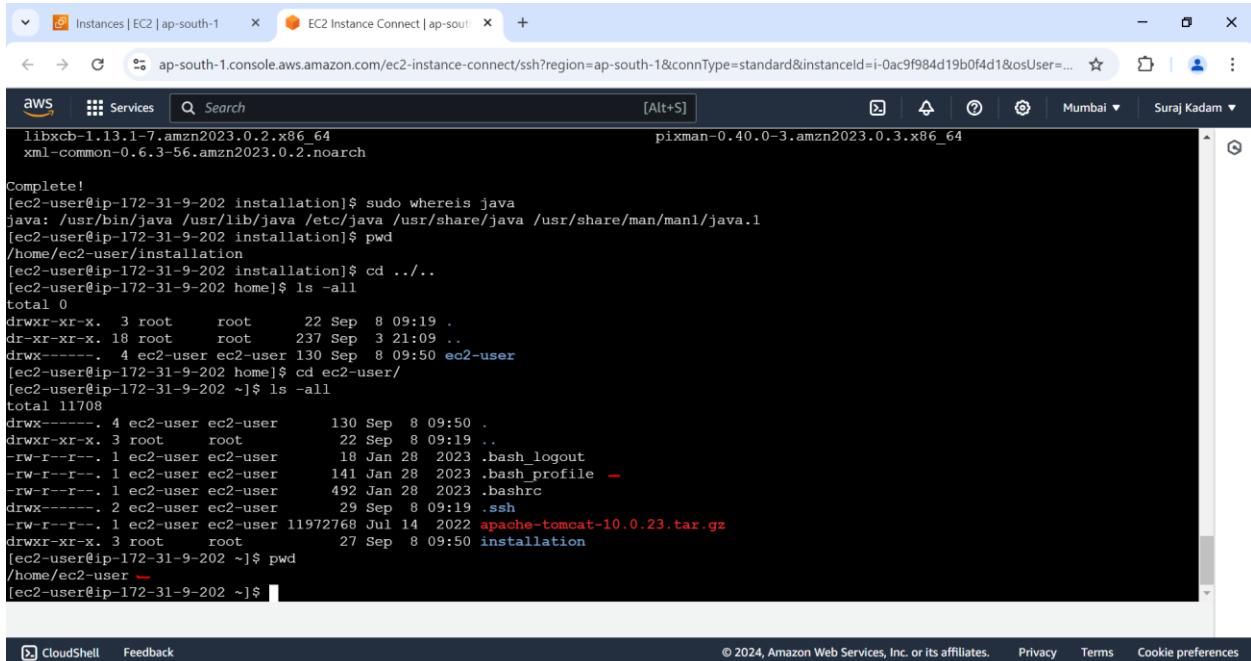
drwxr-xr-x. 7 root root 81 Jul 14 2022 webapps
drwxr-xr-x. 2 root root 6 Jul 14 2022 logs
drwxr-xr-x. 2 root root 16384 Jul 14 2022 conf
-rw-r--r--. 1 root root 16515 Jul 14 2022 RUNNING.txt
-rw-r--r--. 1 root root 6908 Jul 14 2022 RELEASE-NOTES
-rw-r--r--. 1 root root 3398 Jul 14 2022 README.md
-rw-r--r--. 1 root root 2333 Jul 14 2022 NOTICE
-rw-r--r--. 1 root root 60269 Jul 14 2022 LICENSE
-rw-r--r--. 1 root root 6210 Jul 14 2022 CONTRIBUTING.md
-rw-r--r--. 1 root root 20021 Jul 14 2022 BUILDING.txt
drwxr-xr-x. 2 root root 30 Sep 8 09:43 temp
drwxr-xr-x. 2 root root 16384 Sep 8 09:43 lib
drwxr-xr-x. 2 root root 16384 Sep 8 09:43 bin
[ec2-user@ip-172-31-9-202 apache-tomcat]$ cd ..
[ec2-user@ip-172-31-9-202 installation]$ ls
total 16
drwxr-xr-x. 9 root root 16384 Sep 8 09:43 apache-tomcat
[ec2-user@ip-172-31-9-202 installation]$ sudo chmod -R 777 apache-tomcat
[ec2-user@ip-172-31-9-202 installation]$ ls -ltr
total 16
drwxrwxrwx. 9 root root 16384 Sep 8 09:43 apache-tomcat
[ec2-user@ip-172-31-9-202 installation]$ sudo chmod -R 755 apache-tomcat
[ec2-user@ip-172-31-9-202 installation]$ ls -ltr
total 16
drwxr-xr-x. 9 root root 16384 Sep 8 09:43 apache-tomcat
[ec2-user@ip-172-31-9-202 installation]$ 

```

Step -17: Now we must provide java path in .bash_Profile file.

`$ sudo cd /home/ec2-user`

```
$ sudo ls -all
```



```
Instances | EC2 | ap-south-1 EC2 Instance Connect | ap-south-1 + - X
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0acf984d19b0f4d1&osUser=...
[Alt+S] Search Mumbai Suraj Kadam

libxcb-1.13.1-7.amzn2023.0.2.x86_64 pixman-0.40.0-3.amzn2023.0.3.x86_64
xml-common-0.6.3-56.amzn2023.0.2.noarch

Complete!
[ec2-user@ip-172-31-9-202 installation]$ sudo whereis java
java: /usr/bin/java /usr/lib/java /etc/java /usr/share/java /usr/share/man/man1/java.1
[ec2-user@ip-172-31-9-202 installation]$ pwd
/home/ec2-user/installation
[ec2-user@ip-172-31-9-202 installation]$ cd ../..
[ec2-user@ip-172-31-9-202 home]$ ls -all
total 0
drwxr-xr-x. 3 root      root      22 Sep  8 09:19 .
dr-xr-xr-x. 18 root     root     237 Sep  3 21:09 ..
drwx----- 4 ec2-user  ec2-user   130 Sep  8 09:50 ec2-user
[ec2-user@ip-172-31-9-202 home]$ cd ec2-user/
[ec2-user@ip-172-31-9-202 ~]$ ls -all
total 11708
drwx----- 4 ec2-user  ec2-user   130 Sep  8 09:50 .
drwxr-xr-x. 3 root      root      22 Sep  8 09:19 ..
-rw-r--r--. 1 ec2-user  ec2-user    18 Jan 28 2023 .bash_logout
-rw-r--r--. 1 ec2-user  ec2-user    141 Jan 28 2023 .bash_profile -
-rw-r--r--. 1 ec2-user  ec2-user    492 Jan 28 2023 .bashrc
drwx----- 2 ec2-user  ec2-user    29 Sep  8 09:19 .ssh
-rw-r--r--. 1 ec2-user  ec2-user 11972768 Jul 14 2022 apache-tomcat-10.0.23.tar.gz
drwxr-xr-x. 3 root      root      27 Sep  8 09:50 installation
[ec2-user@ip-172-31-9-202 ~]$ pwd
/home/ec2-user
[ec2-user@ip-172-31-9-202 ~]$
```

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Step -17: using nano text editor open the file add java path and save the file using **ctrl+x ==> y ==> Enter.**

```
$ sudo nano ~ .bash_profile
```

```
export JAVA_HOME=/usr/lib/jvm/jre-17-openjdk
```

```
export PATH=$JAVA/bin:$PATH
```

```

total 11708
drwx----- 4 ec2-user ec2-user 130 Sep  8 09:50 .
drwxr-xr-x  3 root   root  22 Sep  8 09:19 ..
-rw-r--r--  1 ec2-user ec2-user 18 Jan 28 2023 .bash_logout
-rw-r--r--  1 ec2-user ec2-user 141 Jan 28 2023 .bash_profile
-rw-r--r--  1 ec2-user ec2-user 492 Jan 28 2023 .bashrc
drwx----- 2 ec2-user ec2-user 29 Sep  8 09:19 .ssh
-rw-r--r--  1 ec2-user ec2-user 11972768 Jul 14 2022 apache-tomcat-10.0.23.tar.gz
drwxr-xr-x  3 root   root  27 Sep  8 09:50 installation
[ec2-user@ip-172-31-9-202 ~]$ pwd
/home/ec2-user
[ec2-user@ip-172-31-9-202 ~]$ sudo cp ~ .bash_Profile .bash_Profile_05092024
cp: target '.bash_Profile_05092024' is not a directory
[ec2-user@ip-172-31-9-202 ~]$ ls -all
total 11708
drwx----- 4 ec2-user ec2-user 130 Sep  8 09:50 .
drwxr-xr-x  3 root   root  22 Sep  8 09:19 ..
-rw-r--r--  1 ec2-user ec2-user 18 Jan 28 2023 .bash_logout
-rw-r--r--  1 ec2-user ec2-user 141 Jan 28 2023 .bash_profile
-rw-r--r--  1 ec2-user ec2-user 492 Jan 28 2023 .bashrc
drwx----- 2 ec2-user ec2-user 29 Sep  8 09:19 .ssh
-rw-r--r--  1 ec2-user ec2-user 11972768 Jul 14 2022 apache-tomcat-10.0.23.tar.gz
drwxr-xr-x  3 root   root  27 Sep  8 09:50 installation
[ec2-user@ip-172-31-9-202 ~]$ sudo vi ~ .bash_profile
2 files to edit
[ec2-user@ip-172-31-9-202 ~]$ sudo whereis java
java: /usr/bin/java /usr/lib/java /etc/java /usr/share/java /usr/share/man/man1/java.1
[ec2-user@ip-172-31-9-202 ~]$ sudo nano ~ .bash_profile

```

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```

GNU nano 5.8
.bash_profile
Modified

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
    . ~/.bashrc
fi

# User specific environment and startup programs
export JAVA_HOME /usr/lib/jvm/jre-17-openjdk
export PATH=$JAVA/bin:$PATH

```

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Step -18: To deploy applications into Tomcat server we will use Host Manager, by default the Host Manager is only accessible from browser running on the same Machine as Tomcat. If you wish to modify this restriction, you will need to edit the Host Manager's context.xml file.

File location: <tomcat-folder>/webapps/manager/META-INF

```

-rwxr-xr-x. 1 root root 2020 Jul 14 2022 shutdown.bat
-rwxr-xr-x. 1 root root 3708 Jul 14 2022 setclasspath.sh
-rwxr-xr-x. 1 root root 3460 Jul 14 2022 setclasspath.bat
-rwxr-xr-x. 1 root root 1970 Jul 14 2022 migrate.sh
-rwxr-xr-x. 1 root root 2096 Jul 14 2022 migrate.bat
-rwxr-xr-x. 1 root root 3382 Jul 14 2022 makebase.sh
-rwxr-xr-x. 1 root root 3606 Jul 14 2022 makebase.bat
-rwxr-xr-x. 1 root root 1965 Jul 14 2022 digest.sh
-rwxr-xr-x. 1 root root 2091 Jul 14 2022 digest.bat
-rwxr-xr-x. 1 root root 8836 Jul 14 2022 daemon.sh
-rwxr-xr-x. 1 root root 1922 Jul 14 2022 configtest.sh
-rwxr-xr-x. 1 root root 2040 Jul 14 2022 configtest.bat
-rwxr-xr-x. 1 root root 25410 Jul 14 2022 commons-daemon.jar
-rwxr-xr-x. 1 root root 211777 Jul 14 2022 commons-daemon-native.tar.gz
-rwxr-xr-x. 1 root root 1997 Jul 14 2022 ciphers.sh
-rwxr-xr-x. 1 root root 2123 Jul 14 2022 ciphers.bat
-rwxr-xr-x. 1 root root 24814 Jul 14 2022 catalina.sh
-rwxr-xr-x. 1 root root 16266 Jul 14 2022 catalina.bat
-rwxr-xr-x. 1 root root 1664 Jul 14 2022 catalina-tasks.xml
-rwxr-xr-x. 1 root root 34702 Jul 14 2022 bootstrap.jar
[ec2-user@ip-172-31-9-202 bin]$ cd ../../
[ec2-user@ip-172-31-9-202 installation]$ cd apache-tomcat/webapps/manager/META-INF/ —
[ec2-user@ip-172-31-9-202 META-INF]$ pwd
/home/ec2-user/installation/apache-tomcat/webapps/manager/META-INF
[ec2-user@ip-172-31-9-202 META-INF]$ ls -ltr
total 4
-rwxr-xr-x. 1 root root 1352 Jul 14 2022 context.xml —
[ec2-user@ip-172-31-9-202 META-INF]$ 

```

Backup is important. sudo cp context.xml context.xml_08092024

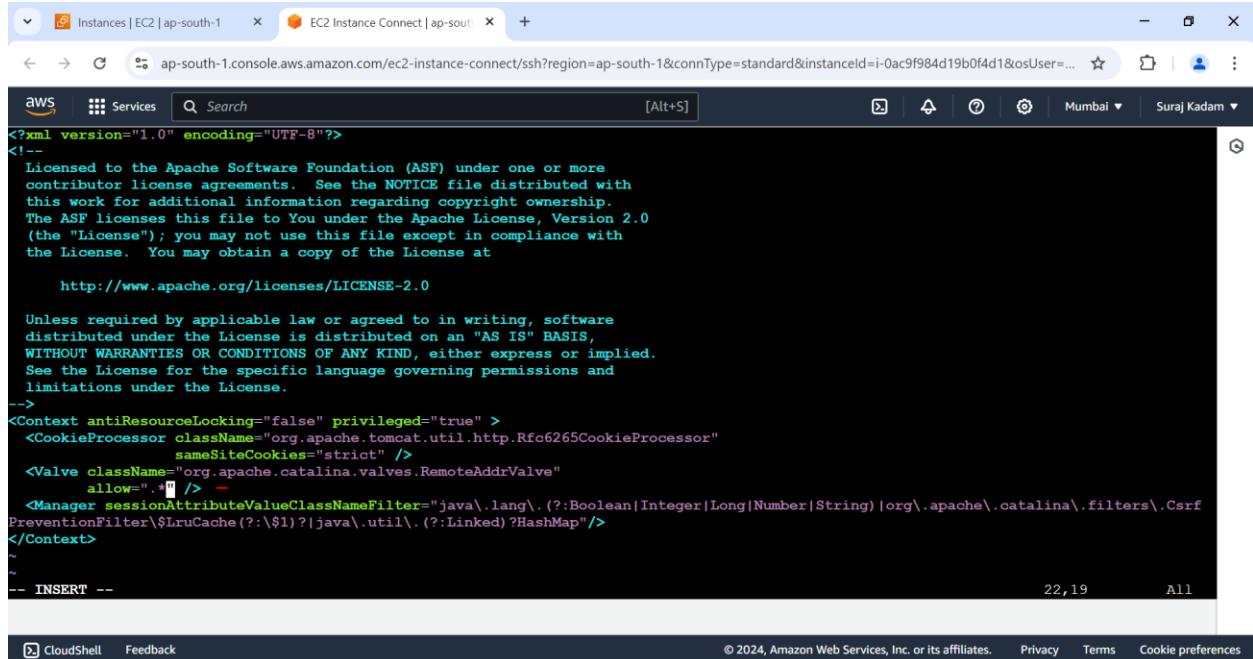
```

-rwxr-xr-x. 1 root root 3382 Jul 14 2022 makebase.sh
-rwxr-xr-x. 1 root root 3606 Jul 14 2022 makebase.bat
-rwxr-xr-x. 1 root root 1965 Jul 14 2022 digest.sh
-rwxr-xr-x. 1 root root 2091 Jul 14 2022 digest.bat
-rwxr-xr-x. 1 root root 8836 Jul 14 2022 daemon.sh
-rwxr-xr-x. 1 root root 1922 Jul 14 2022 configtest.sh
-rwxr-xr-x. 1 root root 2040 Jul 14 2022 configtest.bat
-rwxr-xr-x. 1 root root 25410 Jul 14 2022 commons-daemon.jar
-rwxr-xr-x. 1 root root 211777 Jul 14 2022 commons-daemon-native.tar.gz
-rwxr-xr-x. 1 root root 1997 Jul 14 2022 ciphers.sh
-rwxr-xr-x. 1 root root 2123 Jul 14 2022 ciphers.bat
-rwxr-xr-x. 1 root root 24814 Jul 14 2022 catalina.sh
-rwxr-xr-x. 1 root root 16266 Jul 14 2022 catalina.bat
-rwxr-xr-x. 1 root root 1664 Jul 14 2022 catalina-tasks.xml
-rwxr-xr-x. 1 root root 34702 Jul 14 2022 bootstrap.jar
[ec2-user@ip-172-31-9-202 bin]$ cd ../../
[ec2-user@ip-172-31-9-202 installation]$ cd apache-tomcat/webapps/manager/META-INF/ —
[ec2-user@ip-172-31-9-202 META-INF]$ pwd
/home/ec2-user/installation/apache-tomcat/webapps/manager/META-INF
[ec2-user@ip-172-31-9-202 META-INF]$ ls -ltr
total 4
-rwxr-xr-x. 1 root root 1352 Jul 14 2022 context.xml
[ec2-user@ip-172-31-9-202 META-INF]$ sudo cp context.xml context.xml_08092024
[ec2-user@ip-172-31-9-202 META-INF]$ ls -ltr
total 8
-rwxr-xr-x. 1 root root 1352 Jul 14 2022 context.xml
-rwxr-xr-x. 1 root root 1352 Sep 8 10:39 context.xml_08092024 —
[ec2-user@ip-172-31-9-202 META-INF]$ sudo vi context.xml

```

In Manager context.xml file, change <value> section like below.

allow=""*"



The screenshot shows a terminal window within the AWS CloudShell interface. The title bar indicates the session is connected to an EC2 instance named 'ap-south-1'. The URL in the address bar is 'ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0acf984d19b0f4d1&osUser='.

The content of the terminal window displays the Apache License 2.0 text and a portion of the Tomcat configuration file ('context.xml'). The configuration includes settings for cookie processing, remote address valves, and session attribute filters. A comment '-- INSERT --' is present at the bottom of the configuration section.

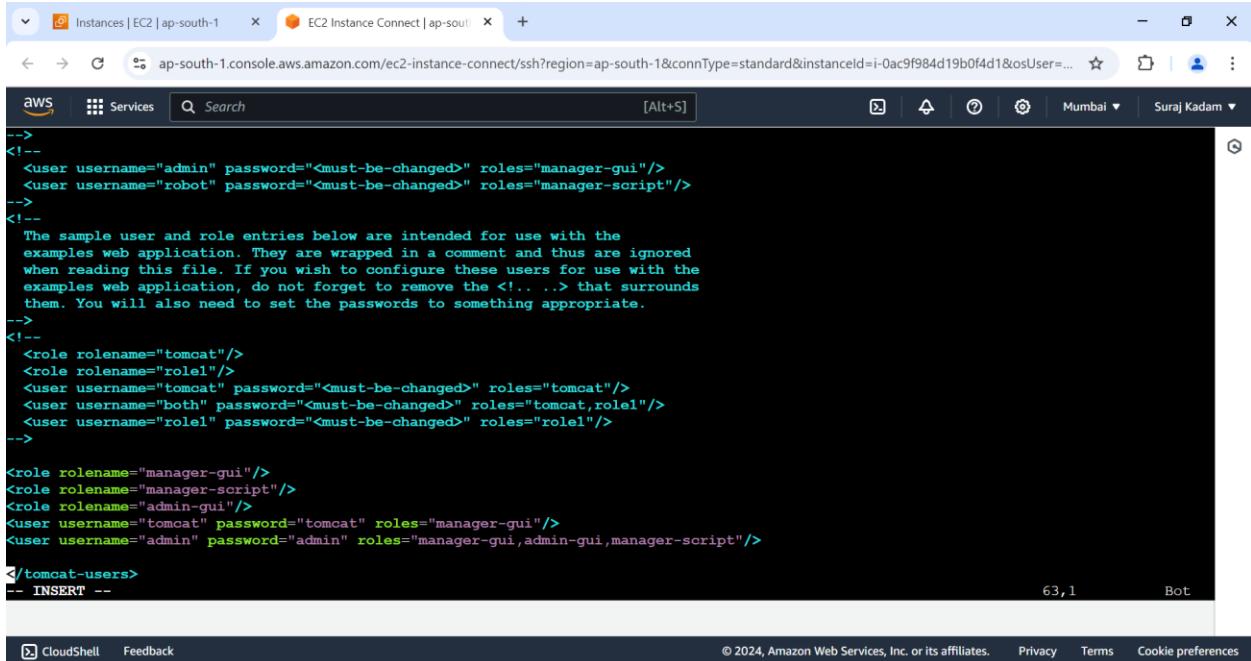
At the bottom of the terminal window, there are status indicators: '22,19' and 'All' on the right, and 'CloudShell' and 'Feedback' on the left. The footer of the CloudShell interface includes links for 'Privacy', 'Terms', and 'Cookie preferences'.

Step -19: Adding Users in tomcat server.

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

Add below Roles and Users in tomcat-users.xml

```
<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"/>
```



The screenshot shows the AWS CloudShell interface. The terminal window displays the contents of the `tomcat-users.xml` file. The file includes sample user entries and a comment indicating they are intended for the examples web application. It also defines roles like `tomcat`, `role1`, and `both`, and users with specific passwords and roles.

```

<!--
  <user username="admin" password="" roles="manager-gui"/>
  <user username="robot" password="" 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="" roles="tomcat"/>
  <user username="both" password="" roles="tomcat,role1"/>
  <user username="role1" password="" 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"/>

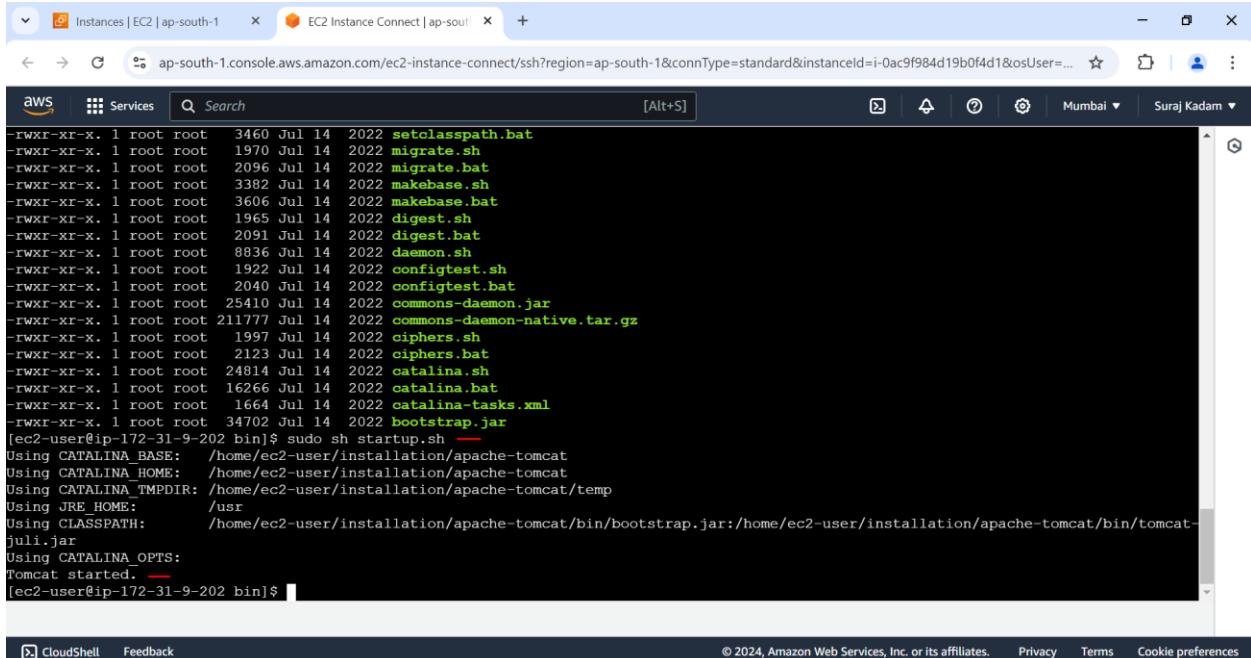
</tomcat-users>
-- INSERT --

```

63,1 Bot

Step -20: After adding Users in tomcat server, go to bin directory and start the Tomcat server.

Start the tomcat server using ‘sh startup.sh’ command.



The screenshot shows the AWS CloudShell interface. The terminal window displays the output of the `sh startup.sh` command. It shows the Tomcat startup process, including setting the CATALINA_HOME environment variable to `/home/ec2-user/installation/apache-tomcat`, and starting the Tomcat service. The log ends with the message "Tomcat started."

```

-rwxr-xr-x. 1 root root 3460 Jul 14 2022 setclasspath.bat
-rwxr-xr-x. 1 root root 1970 Jul 14 2022 migrate.sh
-rwxr-xr-x. 1 root root 2096 Jul 14 2022 migrate.bat
-rwxr-xr-x. 1 root root 3382 Jul 14 2022 makebase.sh
-rwxr-xr-x. 1 root root 3606 Jul 14 2022 makebase.bat
-rwxr-xr-x. 1 root root 1965 Jul 14 2022 digest.sh
-rwxr-xr-x. 1 root root 2091 Jul 14 2022 digest.bat
-rwxr-xr-x. 1 root root 8836 Jul 14 2022 daemon.sh
-rwxr-xr-x. 1 root root 1922 Jul 14 2022 configtest.sh
-rwxr-xr-x. 1 root root 2040 Jul 14 2022 configtest.bat
-rwxr-xr-x. 1 root root 25410 Jul 14 2022 commons-daemon.jar
-rwxr-xr-x. 1 root root 211777 Jul 14 2022 commons-daemon-native.tar.gz
-rwxr-xr-x. 1 root root 1997 Jul 14 2022 ciphers.sh
-rwxr-xr-x. 1 root root 2123 Jul 14 2022 ciphers.bat
-rwxr-xr-x. 1 root root 24814 Jul 14 2022 catalina.sh
-rwxr-xr-x. 1 root root 16266 Jul 14 2022 catalina.bat
-rwxr-xr-x. 1 root root 1664 Jul 14 2022 catalina-tasks.xml
-rwxr-xr-x. 1 root root 34702 Jul 14 2022 bootstrap.jar
[ec2-user@ip-172-31-9-202 bin]$ sudo sh startup.sh
Using CATALINA_BASE: /home/ec2-user/installation/apache-tomcat
Using CATALINA_HOME: /home/ec2-user/installation/apache-tomcat
Using CATALINA_TMPDIR: /home/ec2-user/installation/apache-tomcat/temp
Using JRE_HOME: /usr
Using CLASSPATH: /home/ec2-user/installation/apache-tomcat/bin/bootstrap.jar:/home/ec2-user/installation/apache-tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
[ec2-user@ip-172-31-9-202 bin]$ 

```

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Step -21: Once Tomcat server started, we can access Tomcat server admin console using EC2 instance Public IP.

The screenshot shows the AWS EC2 Instances page. The left sidebar includes options like EC2 Dashboard, EC2 Global View, Events, Instances (with Instances selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, and Images (with AMIs selected). The main content area displays a table of instances:

Name	Instance ID	Instance state	Instance type	Status check
NexusServer	i-0ca46ed52cdd69e23	Stopped	t2.micro	-
Jenkins_Server	i-097d2fef27e295122	Stopped	t2.micro	-
Tomcat_Server	i-0ac9f984d19b0f4d1	Running	t2.micro	2/2 checks pass

Below the table, the details for the selected instance (Tomcat_Server) are shown, including its instance ID, public and private IP addresses, and instance state.

Step -22: Still, we are not able to access the service, so we must Open security group of our Tomcat_Server VM

The screenshot shows the AWS EC2 Security Groups page. The left sidebar includes options like EC2 Dashboard, EC2 Global View, Events, Instances (with Instances selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, and Images (with AMIs selected). The main content area shows the details of the launch-wizard-20 security group:

Security group name	Security group ID	Description	VPC ID
launch-wizard-20	sg-0fa486293fc4fde29	launch-wizard-20 created 2024-09-08T07:36:20.749Z	vpc-06378c01b5bccf95e

Below the table, the Inbound rules section shows one rule:

Name	Security group rule...	IP version	Type	Protocol
-	sgr-0d31b73c3260ed5f5	IPv4	SSH	TCP

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The screenshot shows the AWS EC2 ModifyInboundSecurityGroupRules interface. The top navigation bar includes tabs for 'ModifyInboundSecurityGroupRules' and 'EC2 Instance Connect | ap-south-1'. The main content area is titled 'Edit inbound rules' under 'Inbound rules'. It displays two rules:

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-0d31b73c3260ed5f5	SSH	TCP	22	Cus... ▾	Info
-	Custom TCP	TCP	8080	An... ▾	Info

A warning message at the bottom states: "⚠ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only." At the bottom right, there are 'Cancel', 'Preview changes', and 'Save rules' buttons.

Save rules

We can access Tomcat Server in our Browser like below.

The screenshot shows the Apache Tomcat 10.0.23 homepage. At the top, there are tabs for Instances | EC2 | ap-south-1, EC2 Instance Connect | ap-south-1, and Apache Tomcat/10.0.23. The URL is 13.232.208.251:8080. The main content area features a green banner with the text "If you're seeing this, you've successfully installed Tomcat. Congratulations!" and a cartoon cat icon. Below the banner, there's a section titled "Developer Quick Start" with links to Tomcat Setup, First Web Application, Realms & AAA, JDBC DataSources, Examples, Servlet Specifications, and Tomcat Versions. To the right, there are buttons for Server Status, Manager App, and Host Manager. The footer contains sections for Managing Tomcat, Documentation, and Getting Help.

Step -23: Click on Manager app to deploy the application (it will ask credentials, enter the credentials which we have configured in ‘tomcat-users.xml’ file)

The screenshot shows the Apache Tomcat Manager app sign-in page. The URL is 13.232.208.251:8080/manager/html. The page has a "Sign in" form with fields for Username (admin) and Password (.....). There are "Sign in" and "Cancel" buttons at the bottom. The background shows the Apache Tomcat homepage.

After login success we can see below list of Applications Running in Tomcat (This are default applications)

The screenshot shows the Apache Tomcat Web Application Manager interface. At the top, there's a header bar with tabs for 'Instances | EC2 | ap-south-1' and 'EC2 Instance Connect | ap-south-1'. The main title is 'Tomcat Web Application Manager'. Below the title, there's a message box with 'Message: OK'. The interface has a yellow header bar labeled 'Manager' with tabs for 'List Applications', 'HTML Manager Help', 'Manager Help', and 'Server Status'. The main content area is titled 'Applications' and contains a table with four rows. Each row represents a deployed application with columns for Path, Version, Display Name, Running status, Sessions count, and Commands (Start, Stop, Reload, Undeploy, Expire sessions). The applications listed are: 'Welcome to Tomcat' at path '/', 'Tomcat Documentation' at path '/docs', 'Servlet and JSP Examples' at path '/examples', and 'Tomcat Host Manager Application' at path '/host-manager'.

We can deploy ‘.war’ file from Tomcat Web Application Manager.

Choose War file and click on ‘Deploy’ Button.

The screenshot shows the Apache Tomcat Web Application Manager interface with the 'Deploy' section active. The title is 'Deploy' and it says 'Deploy directory or WAR file located on server'. It includes fields for Context Path, Version (for parallel deployment), XML Configuration file path, and WAR or Directory path, along with a 'Deploy' button. Below this is a 'WAR file to deploy' section with a 'Select WAR file to upload' field, a 'Choose File' button, and a 'Deploy' button. Further down are sections for 'Configuration' (with 'Re-read TLS configuration files' and 'TLS host name (optional)' fields) and 'Diagnostics' (with 'Find leaks' and 'TLS connector configuration diagnostics' buttons).

The screenshot shows the Apache Tomcat Manager interface. At the top, there are tabs for 'List Applications', 'HTML Manager Help', 'Manager Help', and 'Server Status'. Below this is a table titled 'Applications' with columns: Path, Version, Display Name, Running, Sessions, and Commands. The table lists several 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
/sample	None specified	Hello, World Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

Below the table, there is a 'Deploy' section with a text input field for 'Deploy directory or WAR file located on server'.

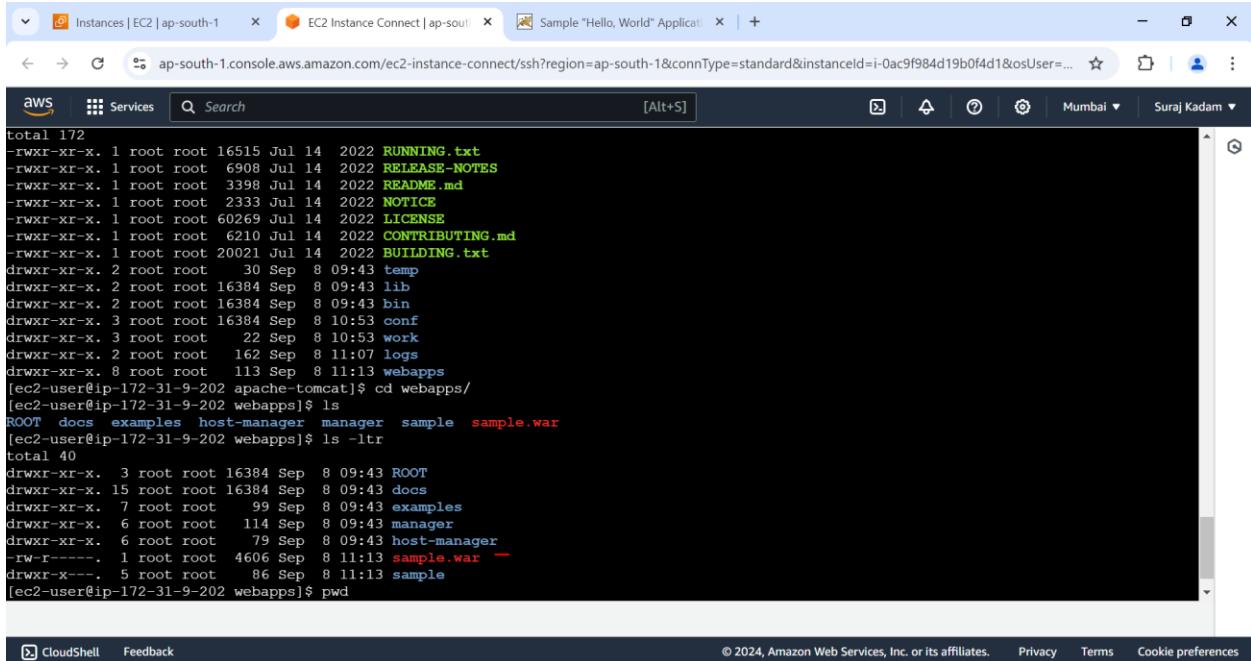
Click on Application name (It will open like below)

The screenshot shows the 'Sample "Hello, World" Application' home page. The title is 'Sample "Hello, World" Application' with a cat icon. Below the title, it says: 'This is the home page for a sample application used to illustrate the source directory organization of a web application utilizing the principles outlined in the Application Developer's Guide.' It also states: 'To prove that they work, you can execute either of the following links:' followed by two bullet points: '• To a [JSP page](#).
• To a [servlet](#)'.

On server inside apache-tomcat/webapps ‘.war’ file placed.

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A screenshot of the AWS CloudShell interface. The title bar shows tabs for 'Instances | EC2 | ap-south-1', 'EC2 Instance Connect | ap-south-1', and 'Sample "Hello, World" Application'. The main area is a terminal window displaying a file listing from an Apache Tomcat installation. The output of the 'ls' command shows the following files and directories:

```
total 172
-rwxr-xr-x. 1 root root 16515 Jul 14 2022 RUNNING.txt
-rwxr-xr-x. 1 root root 6908 Jul 14 2022 RELEASE-NOTES
-rwxr-xr-x. 1 root root 3398 Jul 14 2022 README.md
-rwxr-xr-x. 1 root root 2333 Jul 14 2022 NOTICE
-rwxr-xr-x. 1 root root 60269 Jul 14 2022 LICENSE
-rwxr-xr-x. 1 root root 6210 Jul 14 2022 CONTRIBUTING.md
-rwxr-xr-x. 1 root root 20021 Jul 14 2022 BUILDING.txt
drwxr-xr-x. 2 root root 30 Sep 8 09:43 temp
drwxr-xr-x. 2 root root 16384 Sep 8 09:43 lib
drwxr-xr-x. 2 root root 16384 Sep 8 09:43 bin
drwxr-xr-x. 3 root root 16384 Sep 8 10:53 conf
drwxr-xr-x. 3 root root 22 Sep 8 10:53 work
drwxr-xr-x. 2 root root 162 Sep 8 11:07 logs
drwxr-xr-x. 8 root root 113 Sep 8 11:13 webapps
[ec2-user@ip-172-31-9-202 apache-tomcat]$ cd webapps
[ec2-user@ip-172-31-9-202 webapps]$ ls
ROOT docs examples host-manager manager sample sample.war
[ec2-user@ip-172-31-9-202 webapps]$ ls -ltr
total 40
drwxr-xr-x. 3 root root 16384 Sep 8 09:43 ROOT
drwxr-xr-x. 15 root root 16384 Sep 8 09:43 docs
drwxr-xr-x. 7 root root 99 Sep 8 09:43 examples
drwxr-xr-x. 6 root root 114 Sep 8 09:43 manager
drwxr-xr-x. 6 root root 79 Sep 8 09:43 host-manager
-rw-r-----. 1 root root 4606 Sep 8 11:13 sample.war
drwxr-x---. 5 root root 86 Sep 8 11:13 sample
[ec2-user@ip-172-31-9-202 webapps]$ pwd
```

The terminal prompt shows the user is connected to an EC2 instance with IP 172.31.9.202, running the apache-tomcat service.

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