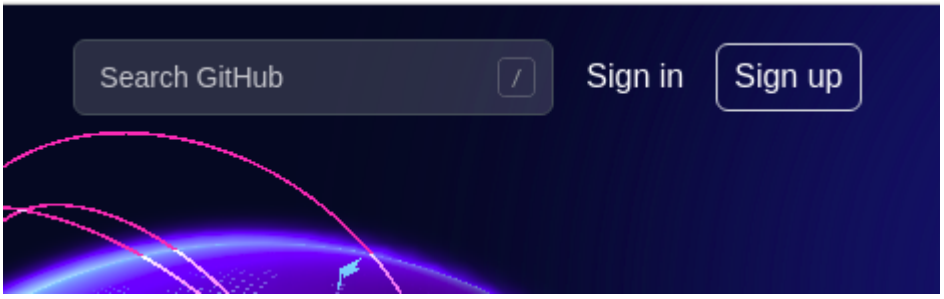
Jenkins Model Project

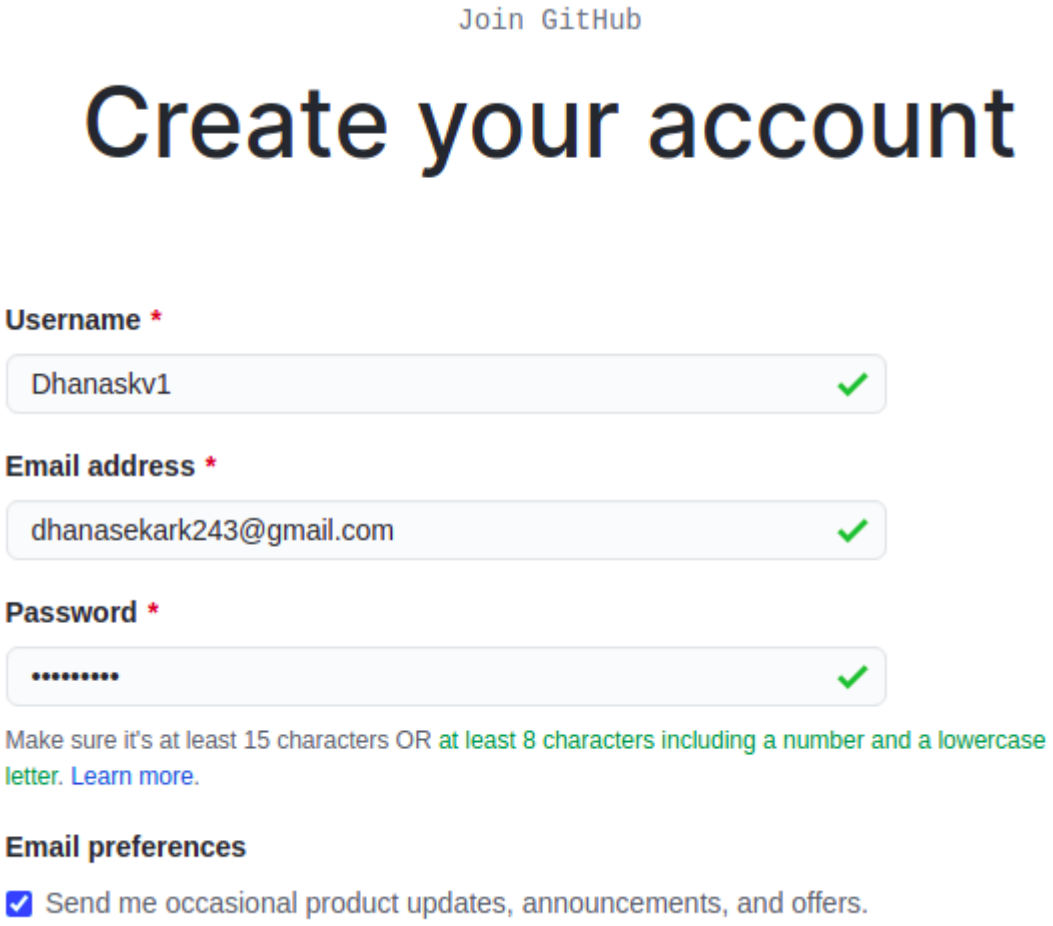
1.Create GitHub Account:

Github is a code hosting platform and mainly used for Git simplifies the process of working with other people and makes it easy to collaborate on projects

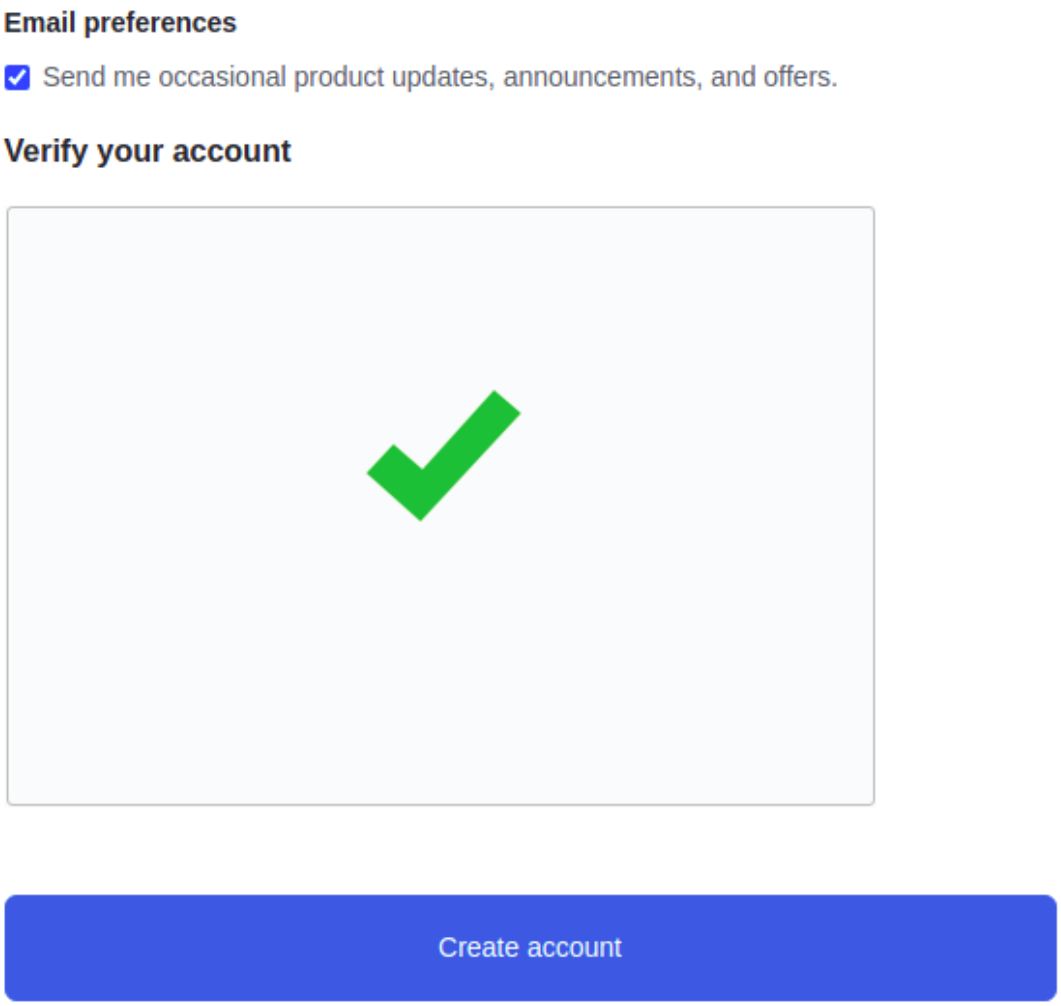
a)goto the browser then search github.com and click **Sign up**



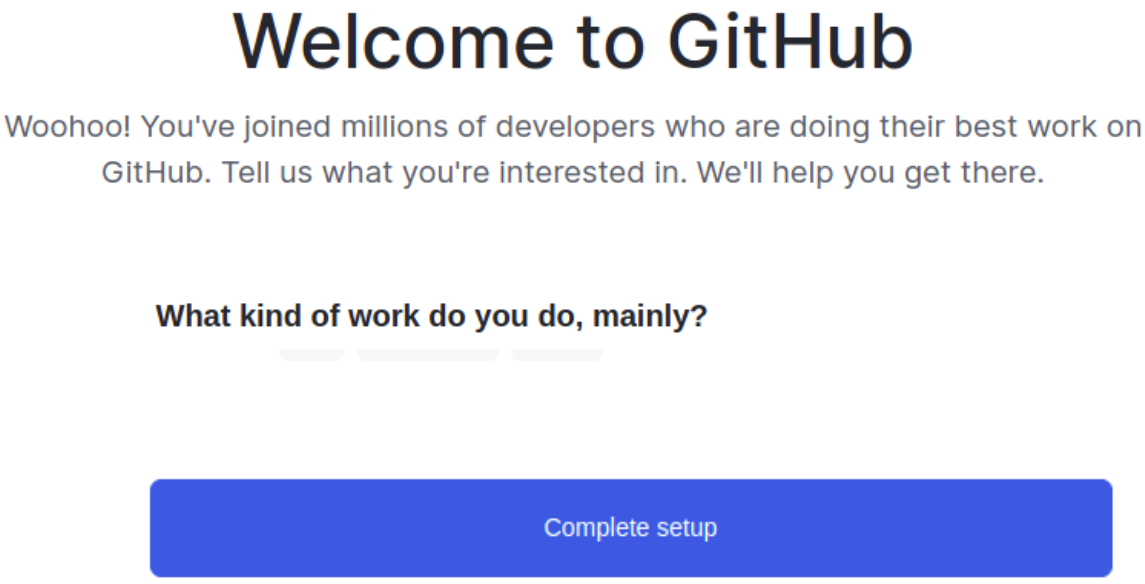
b)Enter All **credentials :**



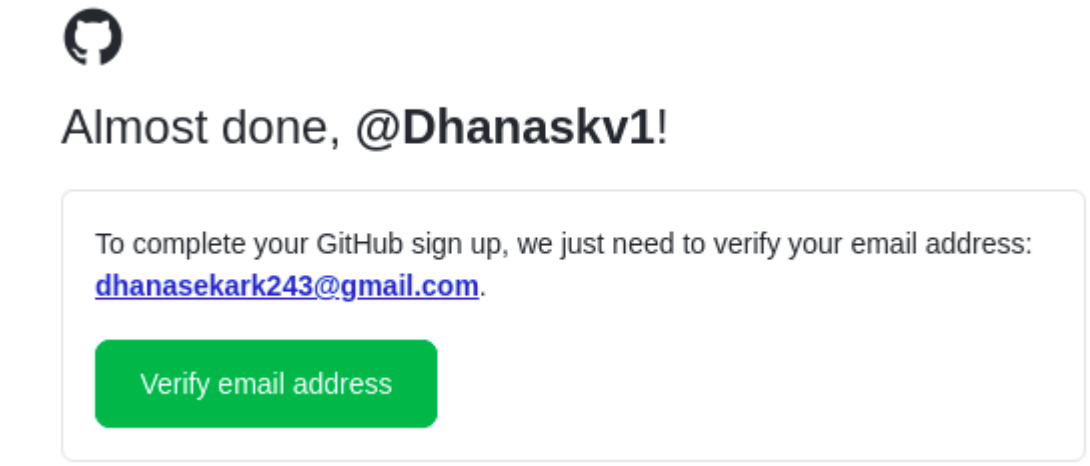
c) Then click **create account**



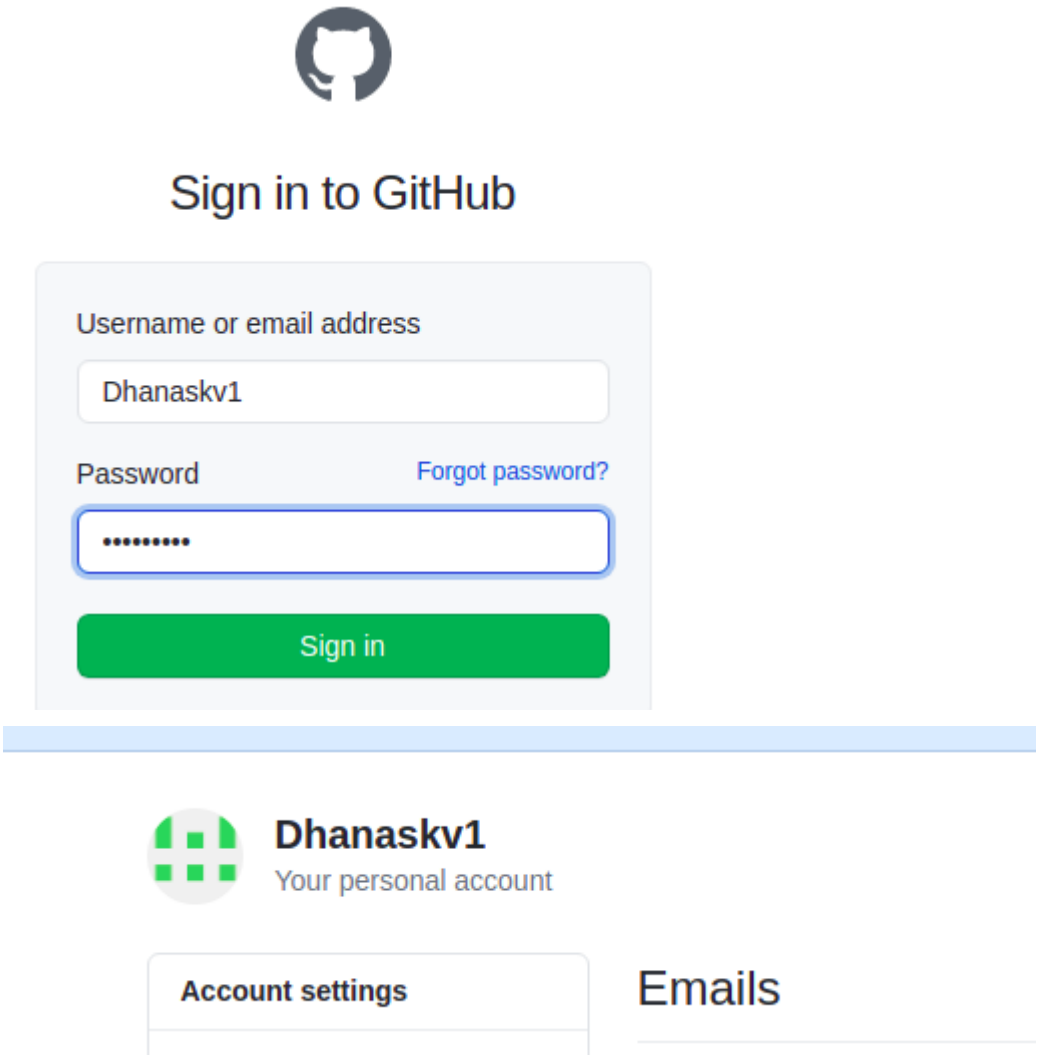
d)Then click **Complete setup**



e)Then goto the **email** Click **Verify email address**



f) Then finally below image will appear



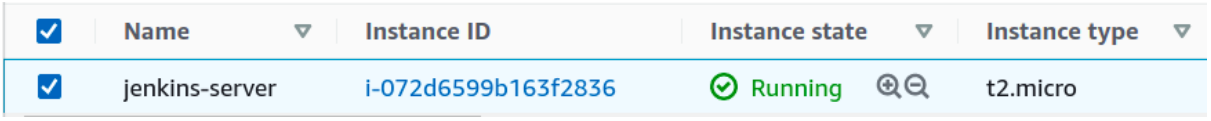
2.Simple Java Project

Link: https://github.com/ValaxyTech/hello-w...

3.Create AWS Account

4.Jenkins Installation and configuration

a) Launch RHEL linux in EC2 Instance



Name	Instance ID	Instance state	Instance type
jenkins-server	i-072d6599b163f2836	Running	t2.micro

b) Install Java and Set path

We will be using open java

```
yum install java-1.8*
```

```
[root@ip-172-31-91-105 ec2-user]#  yum install java-1.8* -y
```

c) Confirm Java Version

```
[root@ip-172-31-91-105 ec2-user]# java -version
openjdk version "1.8.0_282"
OpenJDK Runtime Environment (build 1.8.0_282-b08)
OpenJDK 64-Bit Server VM (build 25.282-b08, mixed mode)
[root@ip-172-31-91-105 ec2-user]#
```

d) We will Set Path in Permanent

So will go the **.bash_profile hidden file**

```
[root@ip-172-31-91-105 ~]# vi .bash_profile
```

Put the below line

```
JAVA_HOME=/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.191.b12-1
.el7_6.x86_64
export JAVA_HOME
PATH=$PATH:$JAVA_HOME
```

```
# .bash_profile

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

# User specific environment and startup programs
JAVA_HOME=/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.191.b12-1.el7_6.x86_64
PATH=$PATH:$JAVA_HOME

export PATH
~
```

e) Set it permanently then update it so execute below file

Source ~/.bash_profile

```
[root@ip-172-31-91-105 ~]# source ~/.bash_profile
[root@ip-172-31-91-105 ~]#
```

f) Enter Below Command it will display a java path

echo $PATH

```
[root@ip-172-31-91-105 ~]# echo $PATH
/sbin:/bin:/usr/sbin:/usr/bin:/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.191.b12-1.el
7_6.x86_64
[root@ip-172-31-91-105 ~]#
```

g)Install jenkins

Install wget command

Wget command download files from internet

```
[root@ip-172-31-91-105 ~]# yum install wget -y
```

Download jenkins file in specific name

```
wget -O /etc/yum.repos.d/jenkins.repo
https://pkg.jenkins.io/redhat-stable/jenkins.repo
```

```
[root@ip-172-31-91-105 ~]# wget -O /etc/yum.repos.d/jenkins.repo https://pkg.jen
kins.io/redhat-stable/jenkins.repo
```

Import rpm

```
rpm --import
https://pkg.jenkins.io/redhat-stable/jenkins.io.key
```

```
[root@ip-172-31-91-105 ec2-user]# rpm --import https://pkg.jenkins.io/redhat-sta
ble/jenkins.io.key
```

yum install jenkins -y

```
[root@ip-172-31-91-105 ec2-user]# yum install jenkins -y
```

h) start and enable jenkins service

systemctl start jenkins

systemctl enable jenkins

```
[root@ip-172-31-91-105 ec2-user]# systemctl start jenkins
[root@ip-172-31-91-105 ec2-user]#
```

```
[root@ip-172-31-91-105 ec2-user]# systemctl enable jenkins
jenkins.service is not a native service, redirecting to systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable jenkins
[root@ip-172-31-91-105 ec2-user]#
```

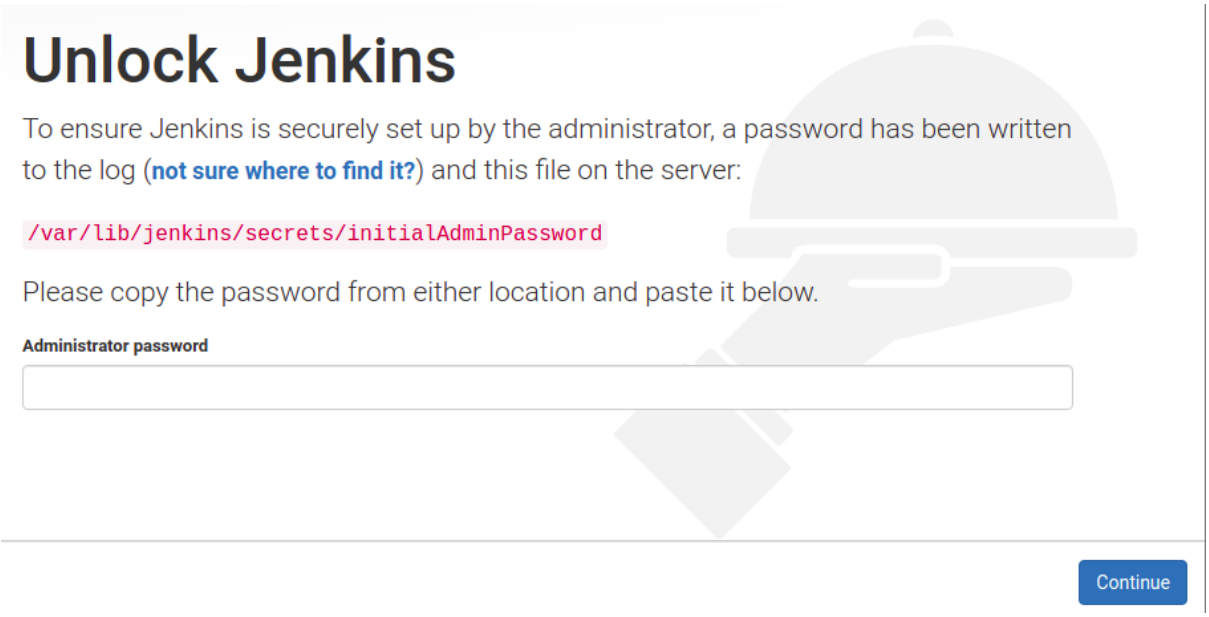
i) check if security group port 8080 open

Type	Protocol	Port range	Source
Custom TCP	TCP	8080	0.0.0.0/0
SSH	TCP	22	103.139.34.0/24

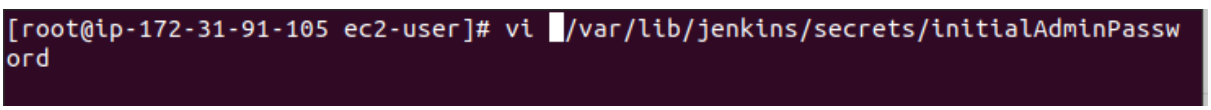
j) Accessing Jenkins

Enter EC2 instance public ip and port 8080 in web browser

Then below image will appear and go to the specified directory and got jenkins password

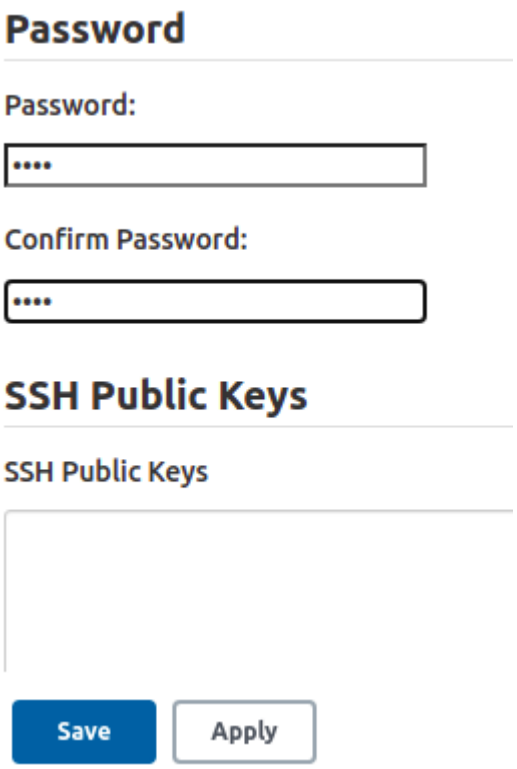


Open vi editor and get jenkins password



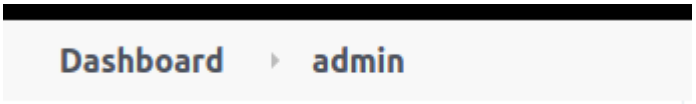
k) skip plugins installation (we do it later)

l) Change admin password
SO goto admin --> configure --> enter password

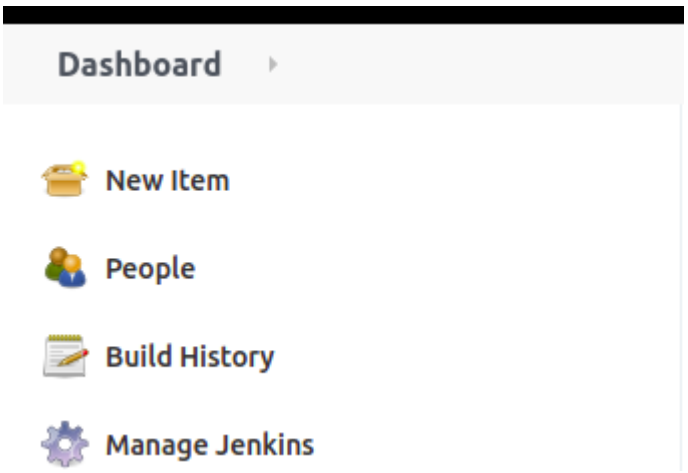


m) Configure Java Path

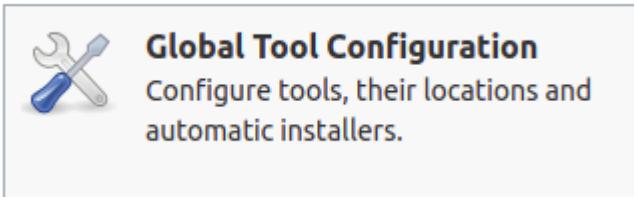
Click Dashboard



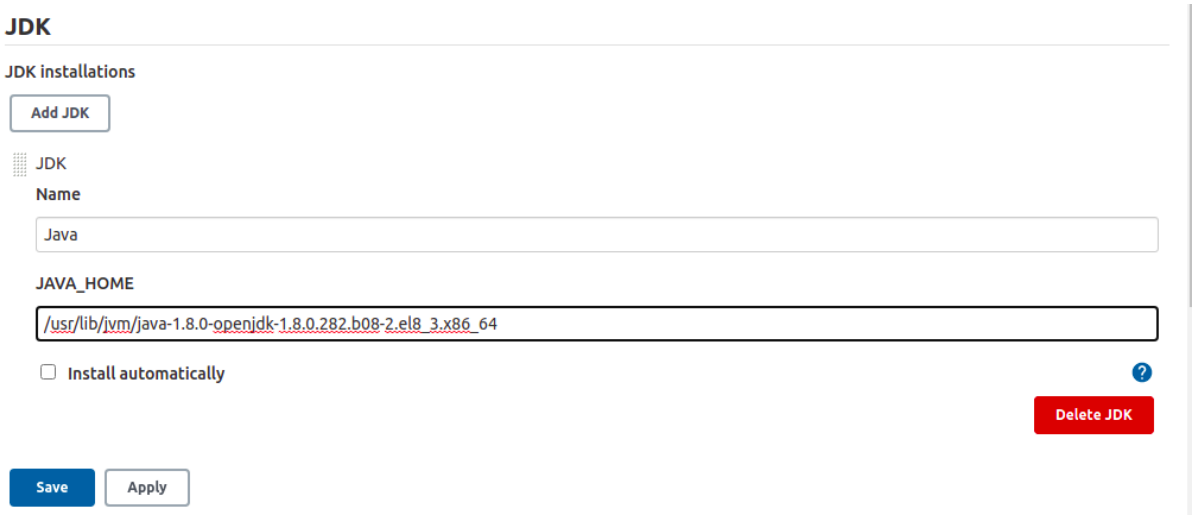
Click Manage jenkins



n)Then Click Global tool configuration



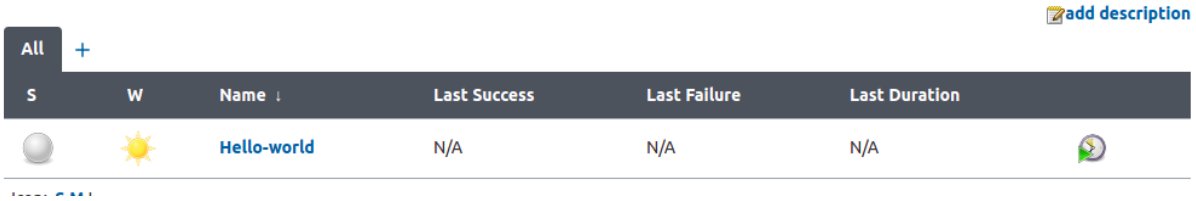
Enter the **JAVA_HOME**



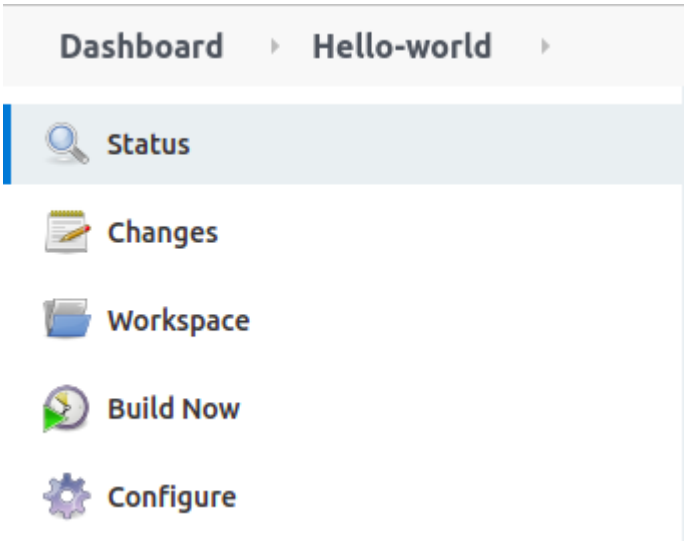
Run Test Job

o) Click new item and Enter item name then click Freestyleproject
Click Build then enter execute shell

Apply and Save then below image will appear



Click hello-world icon and Click Build now



Finally console output

5.Maven & Git Installation and Configuration

A maven is a build tool designed to manage dependencies and the software lifecycle. ... It checks code out of a repository, builds and packages it, and sends it out to a server for testing – automatically. Jenkins can use Maven as its build tool.

1.Copy url in maven website

Maven developers.

	Link
Binary tar.gz archive	apache-maven-3.8.1-bin.tar.gz

2.SSH login in jenkins server then goto /opt directory

3.create directory name as “maven”

3.Dowload maven file in linux cli using wget command

```
[ec2-user@ip-172-31-91-105 maven]$ wget https://mirrors.estointernet.in/apache/m
aven/maven-3/3.8.1/binaries/apache-maven-3.8.1-bin.tar.gz
```

4.extract the maven zip file

```
[ec2-user@ip-172-31-91-105 maven]$ tar -xvf apache-maven-3.8.1-bin.tar.gz
```

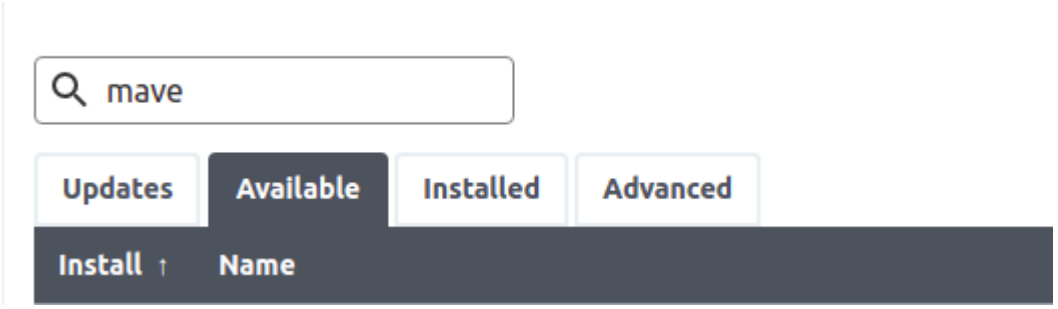
5.goto the home directory and open .bash_profile
6.put the below path that file

M2_HOME=/opt/maven/apache-maven-3.8.1
M2=$M2_HOME/bin

```
M2_HOME=/opt/maven/apache-maven-3.8.1
M2=$M2_HOME/bin
```

7.goto the jenkins web page and click Manage plugins

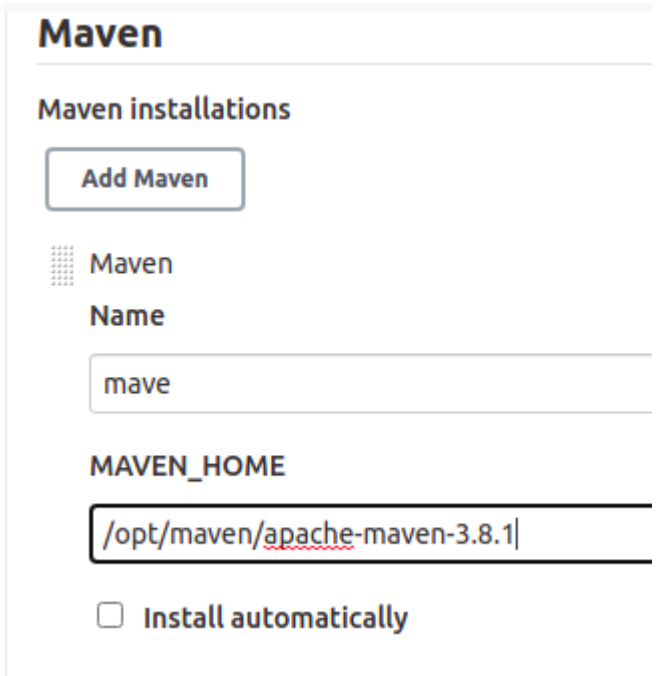
8.Click manage plugins and select maven invoker



9.Click without restart

10.Click Manage Jenkins and Click Global configuration tool

11.add maven path and apply & Save

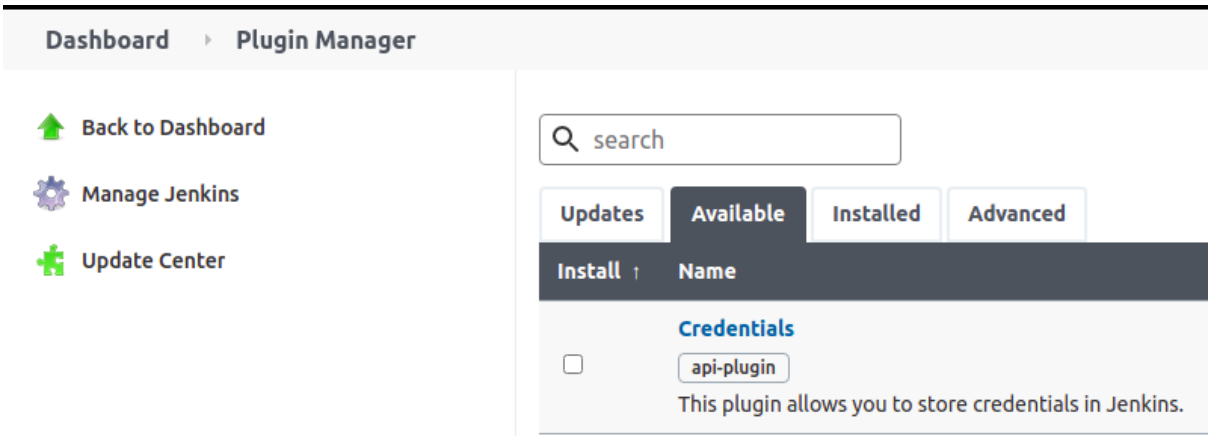


12.Install git

yum install git

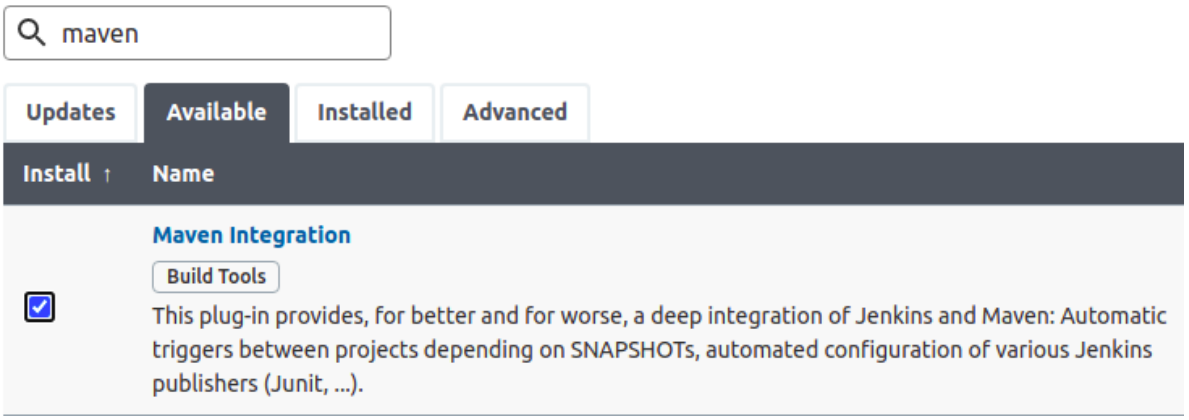
```
[root@ip-172-31-91-105 ec2-user]# yum install git -y
```

13.Click Manage Plugins and Click Available

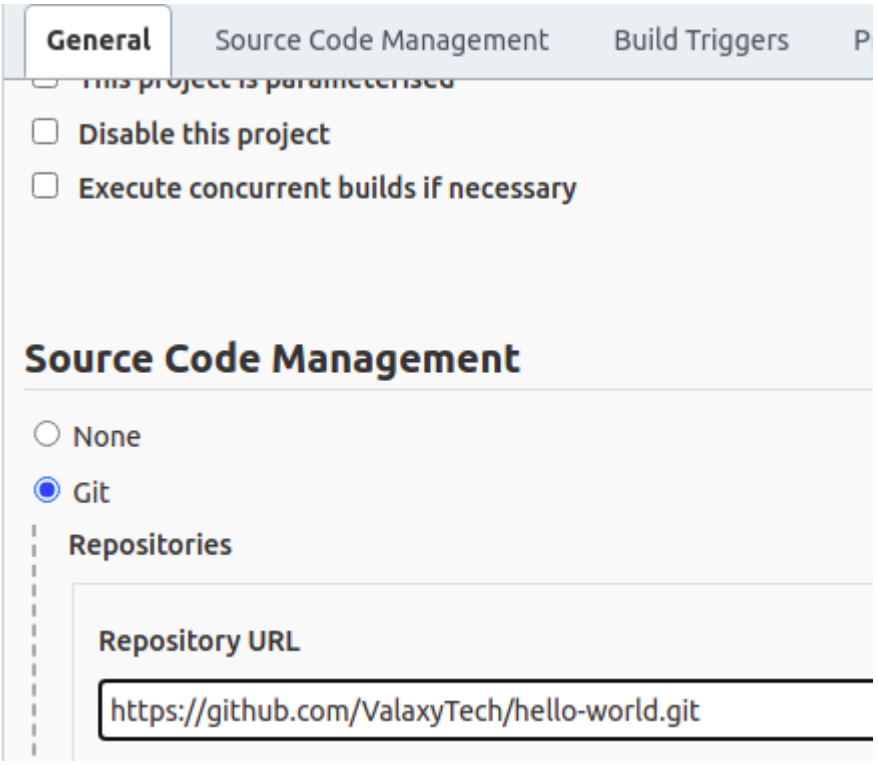


14.Search & click “github” and click without restart

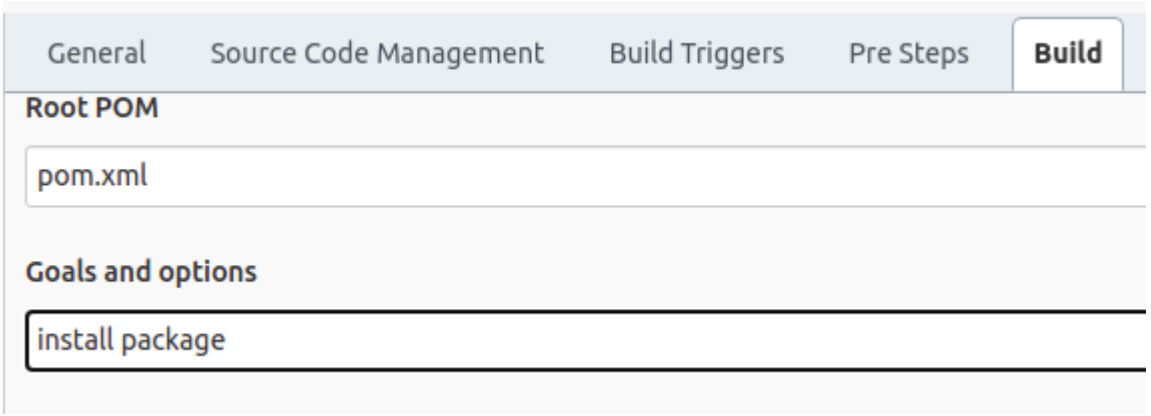
15.Click Manage jenkins and select maven integration



16.go to dashboard and click new item
17.then enter project name and click “Maven project” and click ok
18. Then enter git repository url

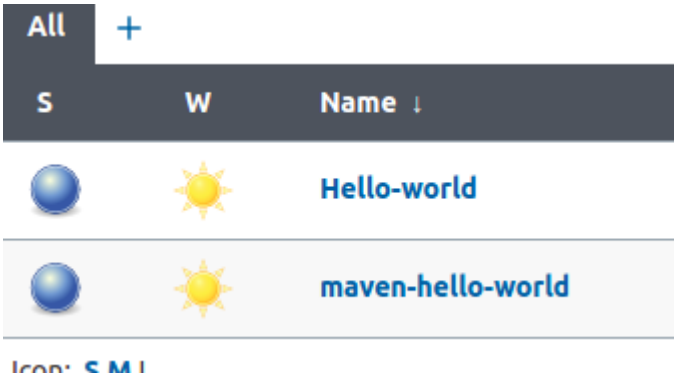


19.click build and Enter “install package”



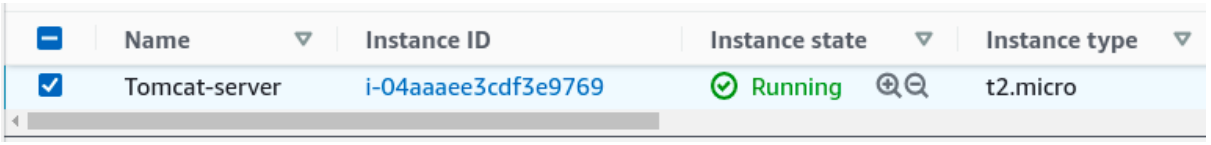
20.Then click and save

21.click build now and will show the blue colour icon
22.finally build runs succss



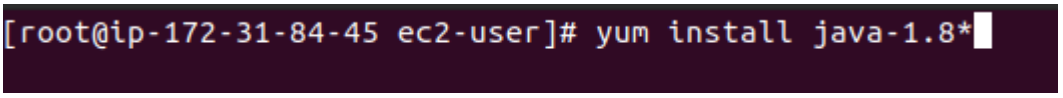
6.Setup and Configure Tomcat Server

a)I have launched EC2 instance



b)install java in command line

yum install java-1.8*



c) Goto browser and copy the tomcat8 url

- Core:
  - zip (pgp, sha512)
  - tar.gz (pgp, sha512)
  - 32-bit Windows zip (pgp, sha512)
  - 64-bit Windows zip (pgp, sha512)
  - 32-bit/64-bit Windows Service Installer (pgp, sha512)

d) Change directory to /opt and First install wget command
Yum install wget -y

e) download tomcat8 in cli

```
[root@ip-172-31-84-45 opt]# wget https://mirrors.estointernet.in/apache/tomcat/
tomcat-8/v8.5.65/bin/apache-tomcat-8.5.65.tar.gz
```

f)extract the file using tar command

tar -xvf apache-tomcat-8.5.65.tar.gz

```
[root@ip-172-31-84-45 opt]# tar -xvf apache-tomcat-8.5.65.tar.gz
```

g)change the directory

cd /opt/apache-tomcat-8.5.65/bin

change file permissions

chmod +x startup.sh
Chmod +x shutdown.sh

```
[root@ip-172-31-84-45 bin]# chmod +x startup.sh
[root@ip-172-31-84-45 bin]# chmod +x shutdown.sh
[root@ip-172-31-84-45 bin]#
```

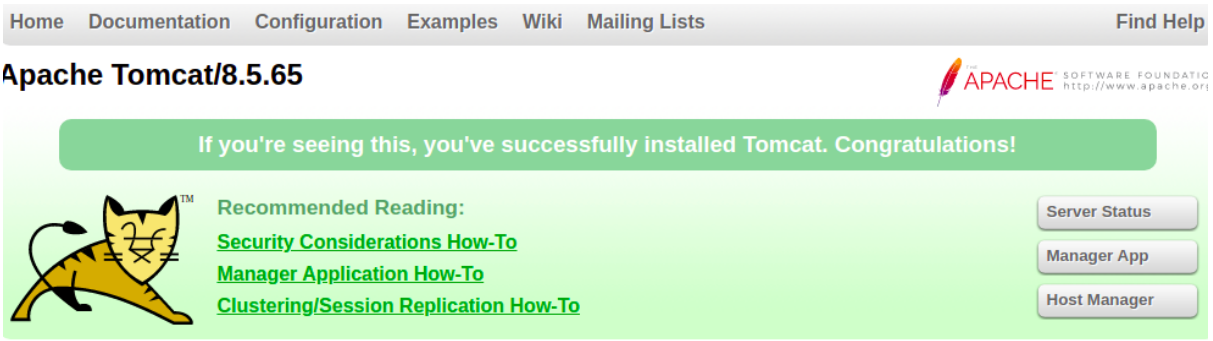
h) create softlink on “startup.sh” and “shutdown.sh” in /usr/local/bin

ln -s /opt/apache-tomcat-8.5.65/bin/startup.sh /usr/local/bin/tomcatup

ln -s /opt/apache-tomcat-8.5.65/bin/shutdown.sh /usr/local/bin/tomcatdown

```
[root@ip-172-31-84-45 bin]# ln -s /opt/apache-tomcat-8.5.65/bin/startup.sh  /usr/local/bin/tomcatup
[root@ip-172-31-84-45 bin]# ln -s /opt/apache-tomcat-8.5.65/bin/shutdown.sh /usr/local/bin/tomcatdown
```

i) then tomcat service is started
j) enter the public ip and port:8080 in web browser then default page will appear



k) Then goto “/opt/apache-tomcat--8.5.65” directory and goto the “config” directory

/opt/apache-tomcat-8.5.65/conf

```
[root@ip-172-31-84-45 conf]# pwd
/opt/apache-tomcat-8.5.65/conf
```

l) using vi editor to open the “server.xml”

Change the port 8090 wherever display and open the port 8090 in AWS Security group

Type	Protocol	Port range	Source
HTTP	TCP	80	0.0.0.0/0
Custom TCP	TCP	8080	0.0.0.0/0
SSH	TCP	22	103.139.34.0/24
Custom TCP	TCP	8090	0.0.0.0/0

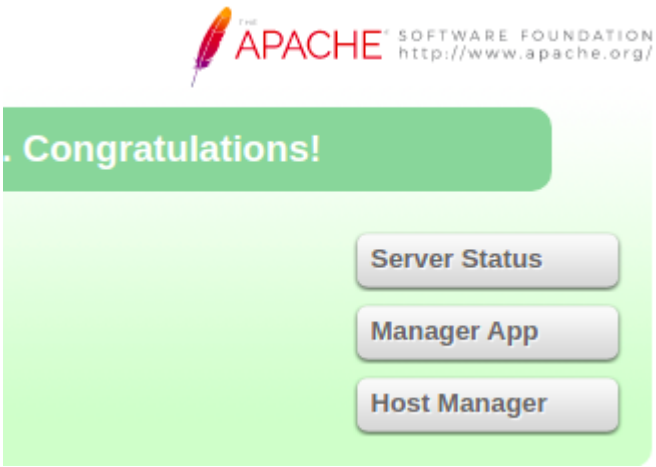
m)then then stop and start tomcat server

tomcatup
tomcatdown

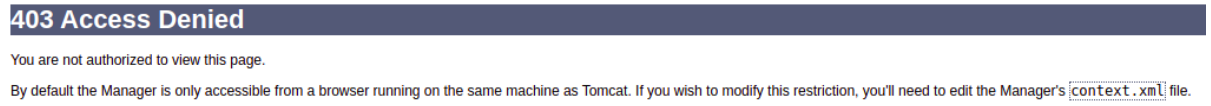
```
[root@ip-172-31-84-45 conf]# tomcatdown
Using CATALINA_BASE:   /opt/apache-tomcat-8.5.65
Using CATALINA_HOME:   /opt/apache-tomcat-8.5.65
Using CATALINA_TMPDIR: /opt/apache-tomcat-8.5.65/temp
Using JRE_HOME:        /
Using CLASSPATH:       /opt/apache-tomcat-8.5.65/bin/bootstrap.jar:/opt/apache-tomcat-8.5.65/bin/tomcat-juli.jar
Using CATALINA_OPTS:
[root@ip-172-31-84-45 conf]# tomcatup
Using CATALINA_BASE:   /opt/apache-tomcat-8.5.65
Using CATALINA_HOME:   /opt/apache-tomcat-8.5.65
Using CATALINA_TMPDIR: /opt/apache-tomcat-8.5.65/temp
Using JRE_HOME:        /
Using CLASSPATH:       /opt/apache-tomcat-8.5.65/bin/bootstrap.jar:/opt/apache-tomcat-8.5.65/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
```

n) finally tomcat default page will appear

o) Click “Manager App”



P) by default the Manager is only accessible from a browser running on the same machine as Tomcat

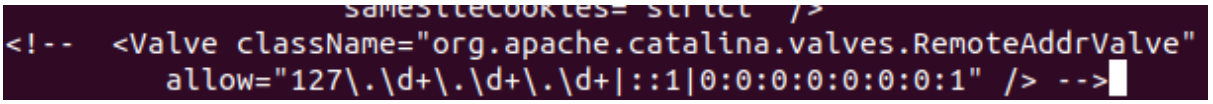


q) using vi editor to open below files

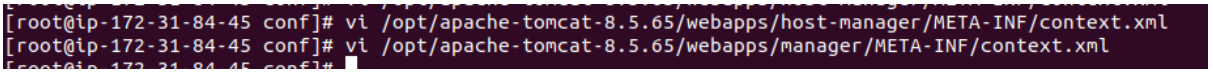
Put the syntax

<!--

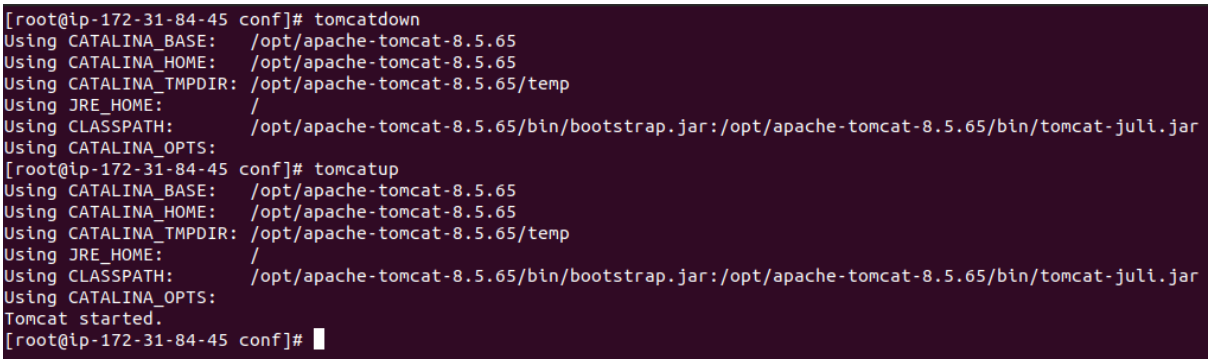
-->



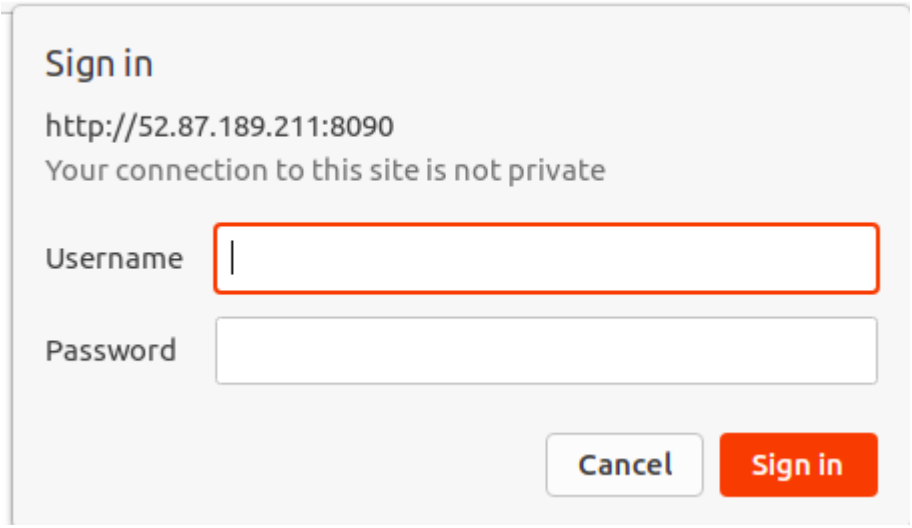
/opt/apache-tomcat-8.5.65/webapps/host-manager/META-INF/context.xml
/opt/apache-tomcat-8.5.65/webapps/manager/META-INF/context.xml



r) then stop and start the tomcat server



s) click “Manager App” and below image will appear



t) then goto the “/opt/apache-tomcat-8.5.65/conf” then edit the “ tomcat-users.xml” using vi editor

```
[root@ip-172-31-84-45 conf]# ls
Catalina              jaspic-providers.xml  tomcat-users.xml
catalina.policy       jaspic-providers.xsd  tomcat-users.xsd
catalina.properties   logging.properties    web.xml
context.xml           server.xml
```

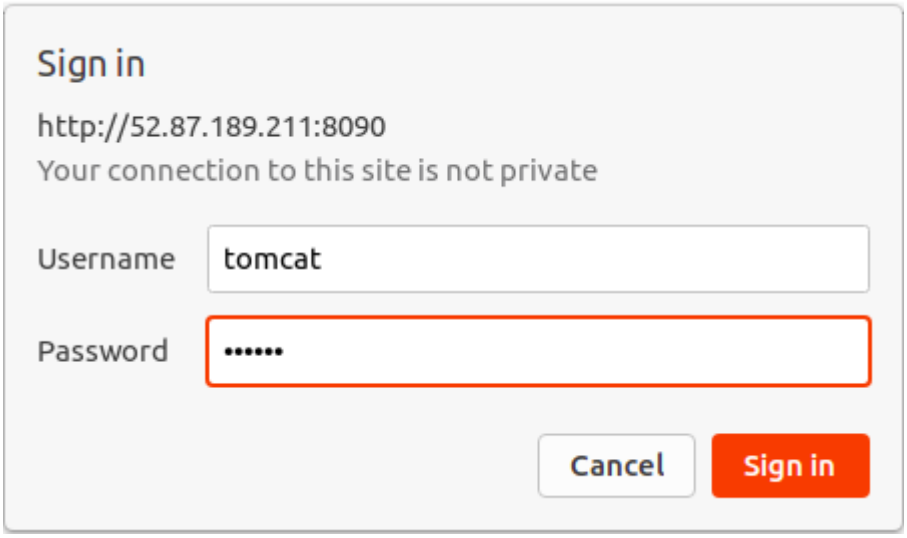
u) put the below output in “tomcat-users.xml” and restart the tomcat server

```
<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"/>
```

```
-->
<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"/>
<!--
  <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"/>
-->
</tomcat-users>
```

```
[root@ip-172-31-84-45 conf]# tomcatdown
Using CATALINA_BASE:   /opt/apache-tomcat-8.5.65
Using CATALINA_HOME:   /opt/apache-tomcat-8.5.65
Using CATALINA_TMPDIR: /opt/apache-tomcat-8.5.65/temp
Using JRE_HOME:        /
Using CLASSPATH:       /opt/apache-tomcat-8.5.65/bin/bootstrap.jar:/opt/apache-tomcat-8.5.65/bin/tomcat-juli.jar
Using CATALINA_OPTS:
[root@ip-172-31-84-45 conf]# tomcatup
Using CATALINA_BASE:   /opt/apache-tomcat-8.5.65
Using CATALINA_HOME:   /opt/apache-tomcat-8.5.65
Using CATALINA_TMPDIR: /opt/apache-tomcat-8.5.65/temp
Using JRE_HOME:        /
Using CLASSPATH:       /opt/apache-tomcat-8.5.65/bin/bootstrap.jar:/opt/apache-tomcat-8.5.65/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
```

v) Enter username and password in “tomcat Manager app”



w) finally below image will appear

Tomcat Web Application Manager

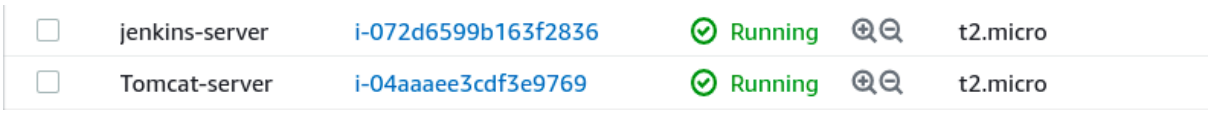
Message:	OK

Manager			
List Applications	HTML Manager Help	Manager Help	Server Status

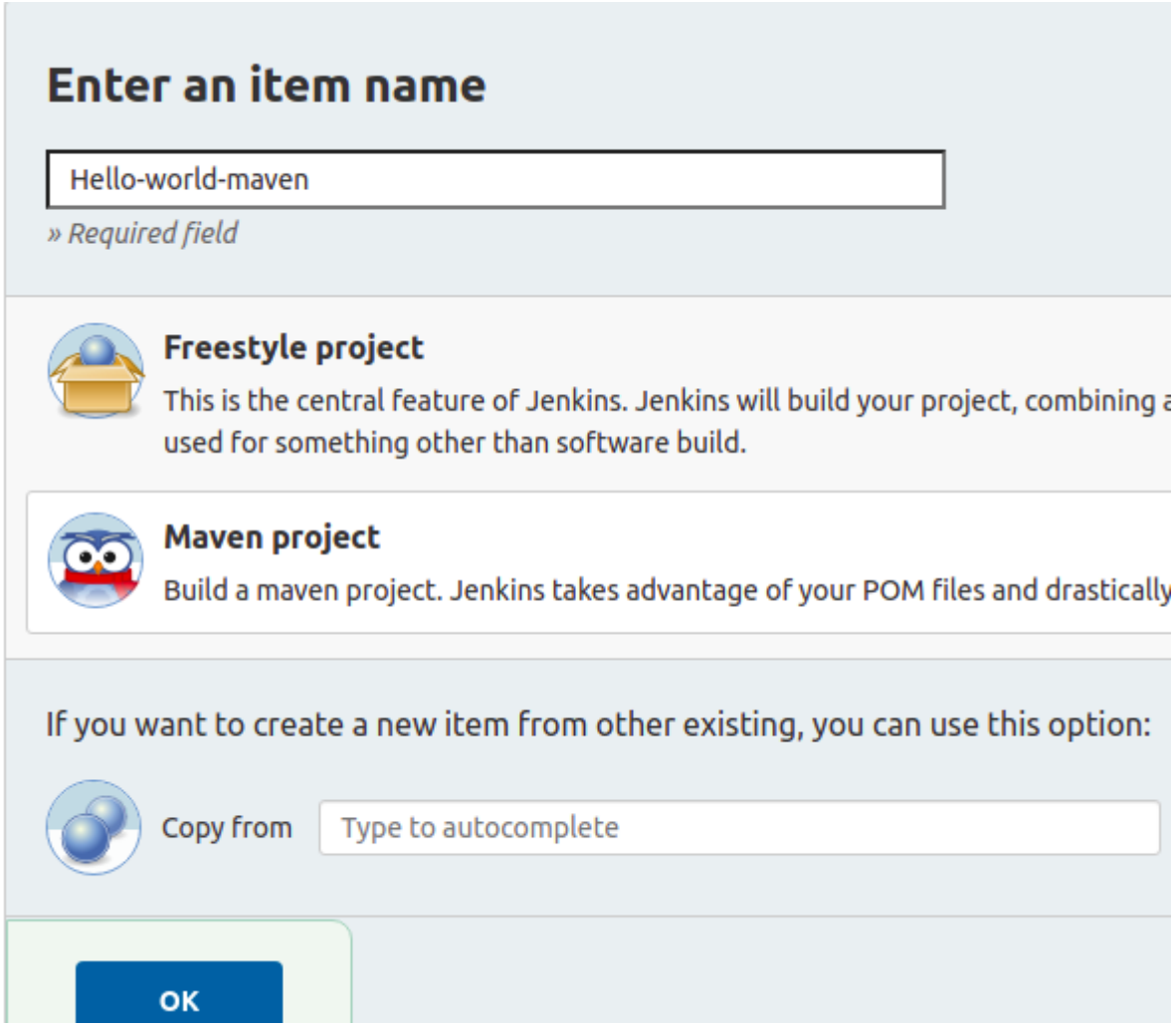
Applications					
Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

Create CI/CD Pipeline

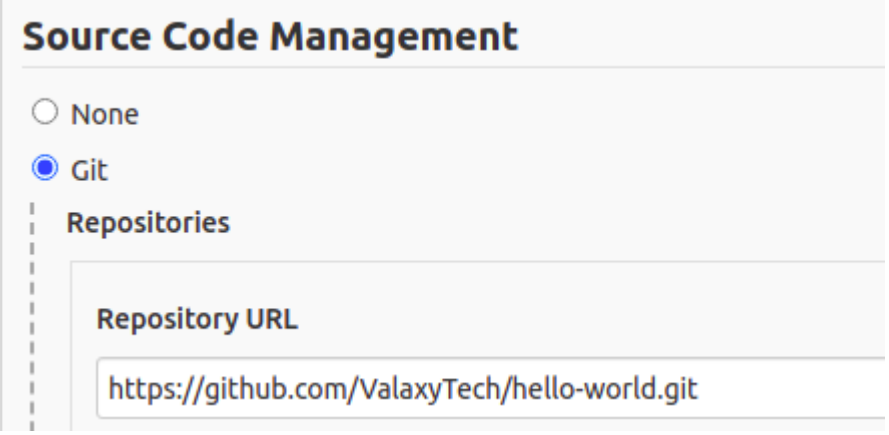
We have already created the Jenkins-server and Tomcat-server

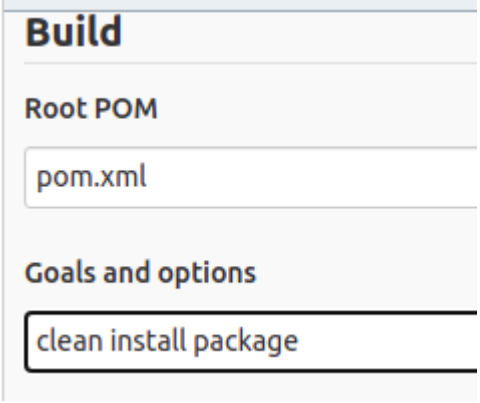


1.Enter the name and click "Maven project" then click ok

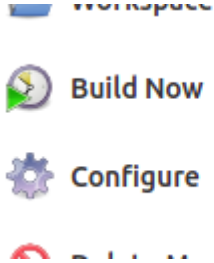


2.Put “git repository url” and put “build goal and options” then apply and save





3.Click build now



4.Then console display build is successful

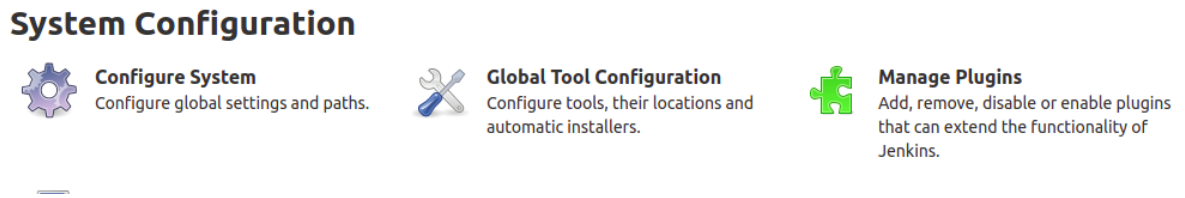
```
[JENKINS] Archiving /var/lib/jenkins/workspace/Hello-world-maven/webapp/pom.xml to com.example.maven-project/webapp/1.0-
SNAPSHOT/webapp-1.0-SNAPSHOT.pom
[JENKINS] Archiving /var/lib/jenkins/workspace/Hello-world-maven/webapp/target/webapp.war to com.example.maven-
project/webapp/1.0-SNAPSHOT/webapp-1.0-SNAPSHOT.war
[JENKINS] Archiving /var/lib/jenkins/workspace/Hello-world-maven/server/pom.xml to com.example.maven-project/server/1.0-
SNAPSHOT/server-1.0-SNAPSHOT.pom
[JENKINS] Archiving /var/lib/jenkins/workspace/Hello-world-maven/server/target/server.jar to com.example.maven-
project/server/1.0-SNAPSHOT/server-1.0-SNAPSHOT.jar
[JENKINS] Archiving /var/lib/jenkins/workspace/Hello-world-maven/pom.xml to com.example.maven-project/maven-project/1.0-
SNAPSHOT/maven-project-1.0-SNAPSHOT.pom
channel stopped
Finished: SUCCESS
```

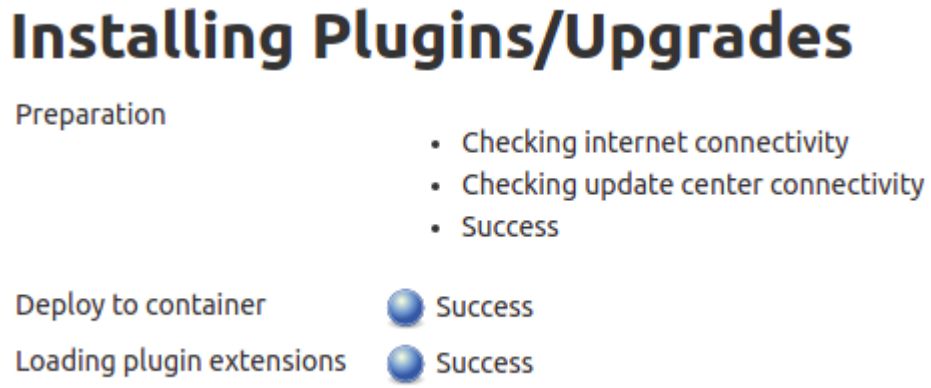
5.using SSH to login tomcat server and restart the tomcat

tomcatup

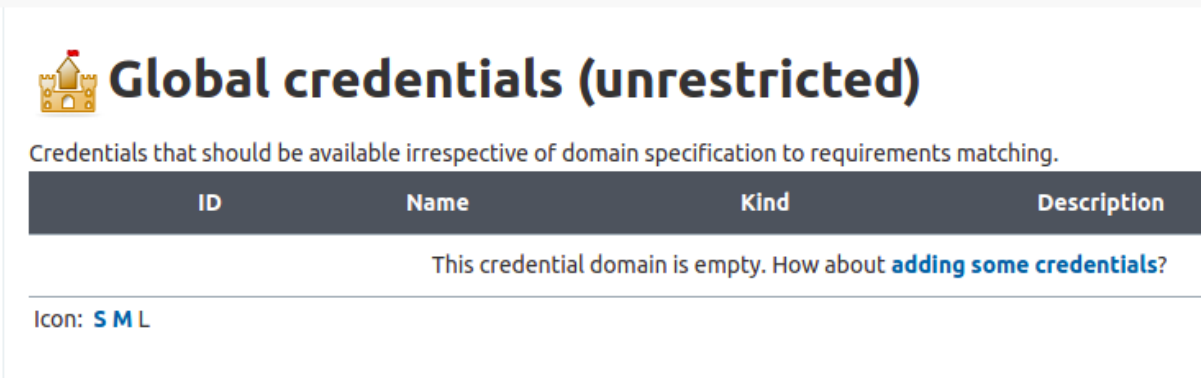
```
[root@ip-172-31-84-45 apache-tomcat-8.5.65]# tomcatup
Using CATALINA_BASE:   /opt/apache-tomcat-8.5.65
Using CATALINA_HOME:   /opt/apache-tomcat-8.5.65
Using CATALINA_TMPDIR: /opt/apache-tomcat-8.5.65/temp
Using JRE_HOME:        /
Using CLASSPATH:       /opt/apache-tomcat-8.5.65/bin/bootstrap.jar:/opt/a
pache-tomcat-8.5.65/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
```

6.Click “Manage jenkins” and click “Manage plugins” then Install “Deploy-plugins” in “jenkins server”

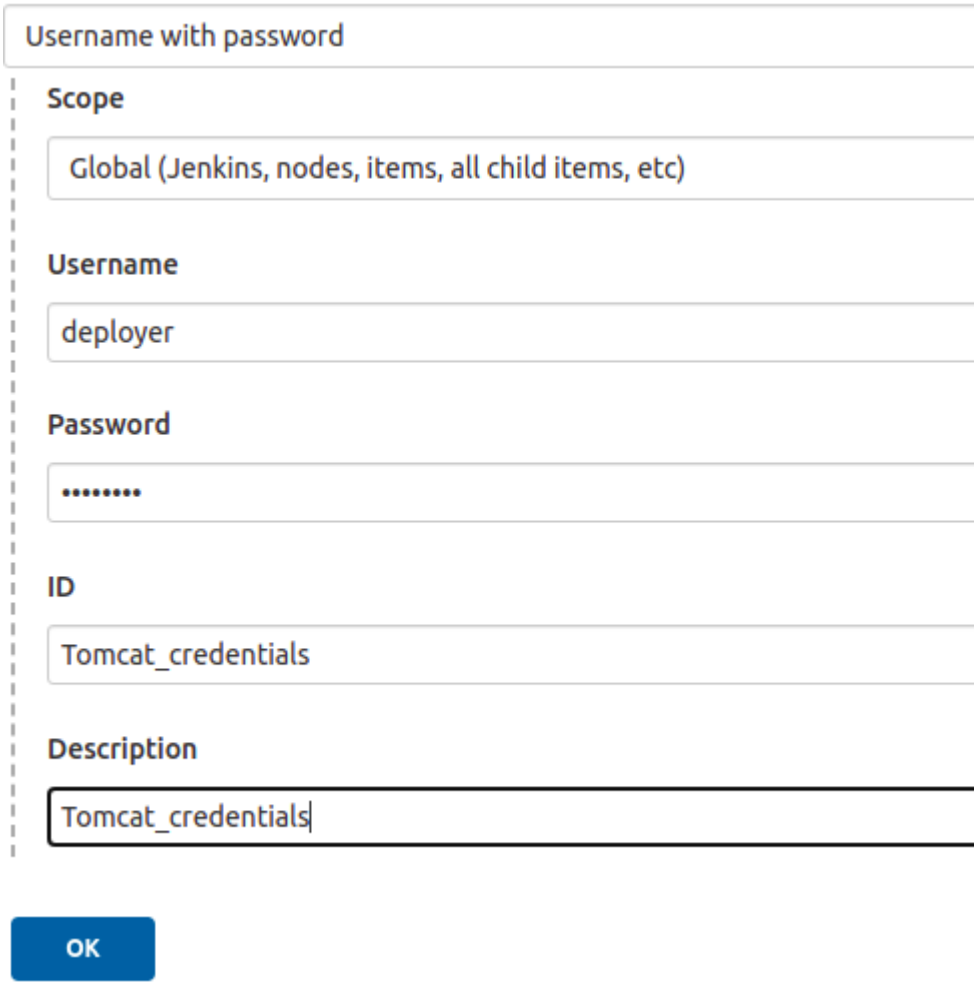




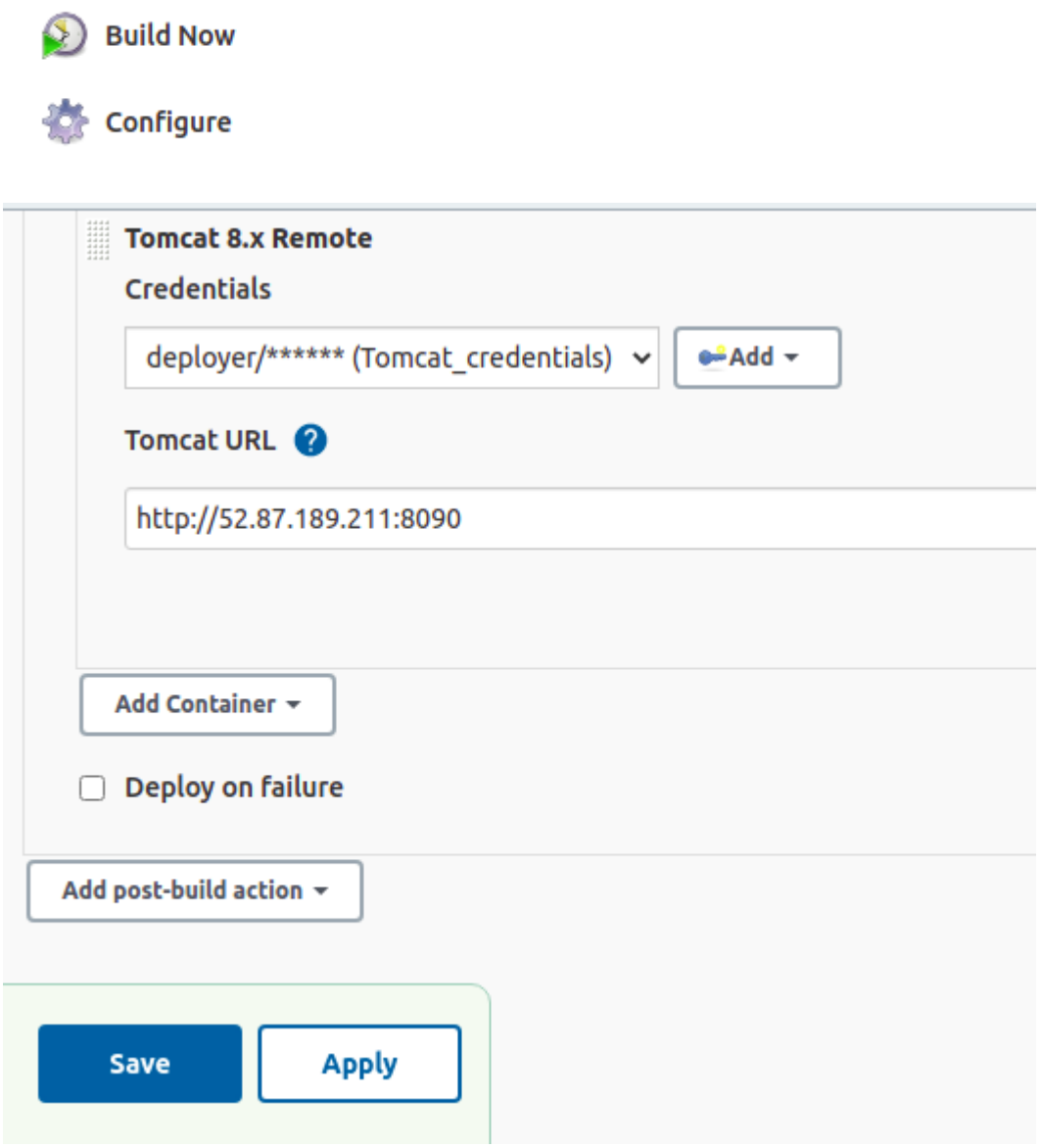
7)click credential option and Click jenkins icon and Click **Global credentials (unrestricted)**



8)click add credentials and put tomcat-server credentials



9)click **dashboard** and click **configure**



10) check file changed in tomcat-server Then Using SSH to login then and Change the directory to

/opt/apache-tomcat-8.5.65/webapps

```
[root@ip-172-31-84-45 webapps]# ls -lt
total 8
drwxr-x---.  4 root root   54 Apr 14 17:57 webapp
-rw-r-----.  1 root root 2444 Apr 14 17:57 webapp.war
drwxr-x---.  6 root root  114 Apr 14 13:23 manager
drwxr-x---.  6 root root   79 Apr 14 13:23 host-manager
drwxr-x---.  7 root root   99 Apr 14 13:23 examples
drwxr-x---. 15 root root 4096 Apr 14 13:23 docs
drwxr-x---.  3 root root  223 Apr 14 13:23 ROOT
```

11.) Click build now and then automatically deployed in tomcat server