

# DevOps Project

**PROBLEM STATEMENT** Create an end-to-end CI/CD pipeline in AWS platform using Jenkins as the orchestration tool, Github as the SCM, Maven as the Build tool, deploy in a docker instance and create a Docker image, Store the docker image in ECR, Achieve Kubernetes deployment using the ECR image. Build a sample java web app using maven.

## **Approach:**

## **Requirements:**

- ✓ CI/CD pipeline System
- ✓ Git - local version control system.
- ✓ GitHub - As Distributed version control system.
- ✓ Jenkins - Continuous Integration tool.
- ✓ Maven - As a Build Tool.
- ✓ docker -Containerization
- ✓ Kubernetes - As Container Management Tool

## **Step-1:**

- Setup CI/CD with GitHub, Jenkins, Maven & Tomcat.
- Setup Jenkins
- Setup & Configure Maven, Git.
- Setup Tomcat Server.

- Integrating GitHub, Maven, Tomcat Server with Jenkins
- Create a CI and CD Job.
- Test the Deployment

### **Step-2:**

- Setup CI/CD with GitHub, Jenkins, Maven & Docker.
- Setting up the docker Environment.
- Create an Image and Container on Docker Host.
- Integrate Docker Host with Jenkins.
- Create CI/CD Job on Jenkins to build and deploy on container.

yum

### **Step-3:**

- Build and Deploy on Container.
- CI/CD with GitHub, Jenkins, Maven & Kubernetes.
- Setting up the Kubernetes (EKS).
- Write pod service and deployment manifest file.
- CI/CD Job to build code on Jenkins & Deploy it on Kubernetes.

### **Step-4:**

- Deploy artifacts on the Kubernetes
- Write codes in the artifacts of docker and Kubernetes which we want to run.
- Now build the code in Jenkins.
- Check in Kubernetes the pods are getting created or not.
- Now copy the service IP and paste it in the browser and check the output.

## Solution:

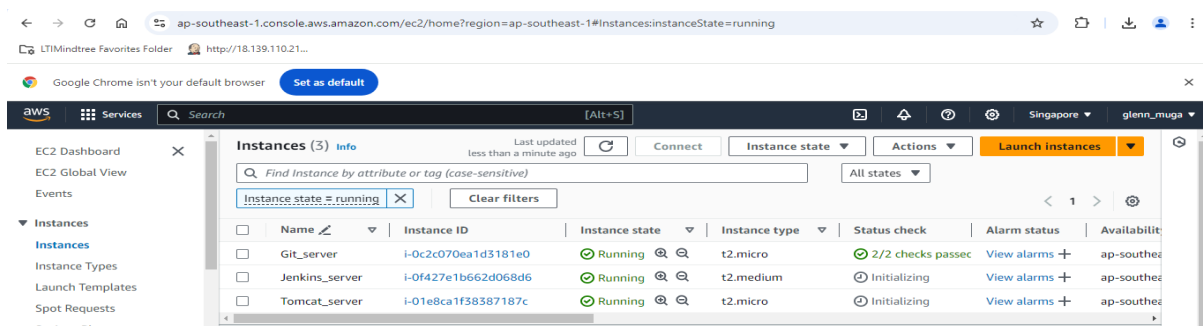
We will create 3 instances,

1 Git Client server

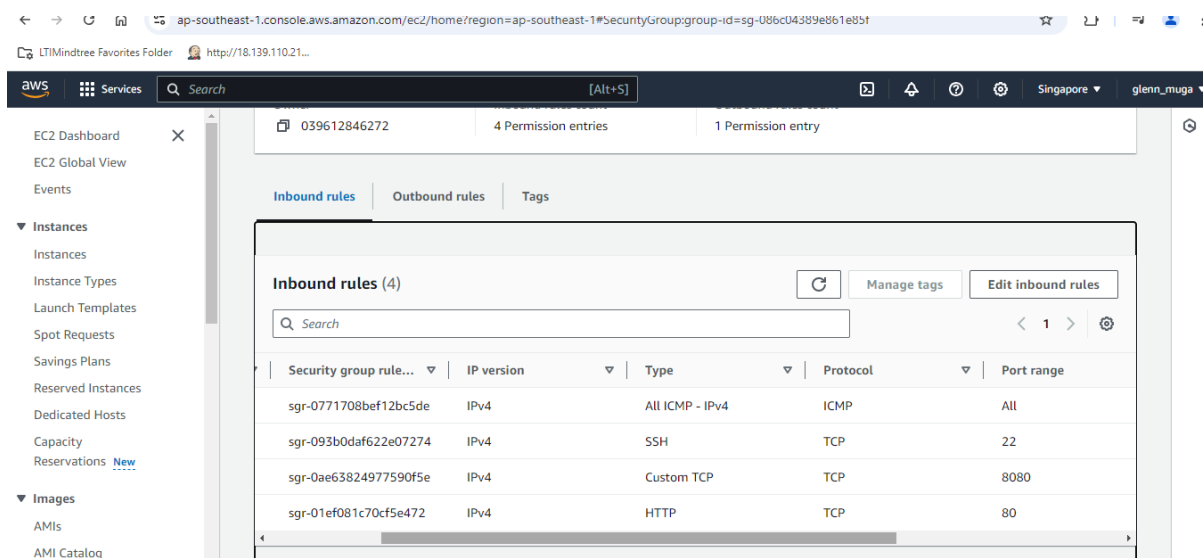
1 Jenkins server

1 tomcat server in the beginning

Choose t2. medium instance type for Jenkins since it requires 2 core cpu



Add Security group rules as suggested below



Connect the instances with the terminal



## Add ssh key to github repo to create a link between the github terminal and web server

github.com/settings/keys

Google Chrome isn't your default browser [Set as default](#)

Security log

Sponsorship log

Developer settings

**Project**  
SHA256: ueQQK0THI1uW1s1abYqY1R1N27R23oK3m55h+o0/gJw  
Added on Sep 20, 2024  
Never used — Read/write [Delete](#)

Check out our guide to [connecting to GitHub using SSH keys](#) or troubleshoot [common SSH problems](#).

**GPG keys** [New GPG key](#)

There are no GPG keys associated with your account.  
[Learn how to generate a GPG key and add it to your account.](#)

**Vigilant mode**

☐ **Flag unsigned commits as unverified**  
This will include any commit attributed to your account but not signed with your GPG or S/MIME key.  
Note that this will include your existing unsigned commits.  
[Learn about vigilant mode.](#)

## Add the git repo to your terminal

```
* Branch HEAD => FETCH_HEAD
[root@githubserver ~]# git branch
* master
[root@githubserver ~]# ls
Dockerfile README.md Snjay_Devops_projetc.pdf pom.xml regapp-deploy.yml regapp-service.yml server webapp
[root@githubserver ~]# git branch -M main
[root@githubserver ~]# git branch
* main
[root@githubserver ~]# |
```

```
root@jenkinsserver ~]# yum install git -y
at metadata expiration check: 0:21:47 ago on Fri Sep 20 12:21:23 2024.
dependencies resolved.
```

Package	Architecture	Version	Repository	Size
Installing:				54 k
git	x86_64	2.40.1-1.amzn2023.0.3	amazonlinux	
Installing dependencies:				
git-core	x86_64	2.40.1-1.amzn2023.0.3	amazonlinux	4.3 M
git-core-doc	noarch	2.40.1-1.amzn2023.0.3	amazonlinux	2.6 M
perl-Error	noarch	1:0.17029-5.amzn2023.0.2	amazonlinux	41 k
perl-File-Find	noarch	1.37-477.amzn2023.0.6	amazonlinux	26 k
perl-Git	noarch	2.40.1-1.amzn2023.0.3	amazonlinux	42 k
perl-TermReadKey	x86_64	2.38-9.amzn2023.0.2	amazonlinux	36 k
perl-lib	x86_64	0.65-477.amzn2023.0.6	amazonlinux	15 k

Transaction Summary

Install 8 Packages

Total download size: 7.1 M  
Total installed size: 34 M  
Downloading Packages:

	Size	Speed	Time
git-2.40.1-1.amzn2023.0.3.x86_64.rpm	54 kB	746 kB/s	00:00
git-core-2.40.1-1.amzn2023.0.3.noarch.rpm	2.6 MB	21 MB/s	00:00
perl-Error-0.17029-5.amzn2023.0.2.noarch.rpm	41 kB	759 kB/s	00:00
perl-File-Find-1.37-477.amzn2023.0.6.noarch.rpm	26 kB	1.6 MB/s	00:00
perl-Git-2.40.1-1.amzn2023.0.3.noarch.rpm	42 kB	1.6 MB/s	00:00
perl-TermReadKey-2.38-9.amzn2023.0.2.x86_64.rpm	36 kB	1.8 MB/s	00:00
perl-lib-0.65-477.amzn2023.0.6.x86_64.rpm	15 kB	732 kB/s	00:00
git-core-2.40.1-1.amzn2023.0.3.x86_64.rpm	4.3 MB	20 MB/s	00:00

Package	Architecture	Version	Repository	Size
Installing: jenkins	noarch	2.462.2-1.1	jenkins	89 M
Transaction Summary				
Install 1 Package				
Total download size: 89 M				
Installed size: 89 M				
Downloading Packages:				
*[[Cjenkins-2.462.2-1.1.noarch.rpm			19 MB/s   89 MB	00:04
Total			19 MB/s   89 MB	00:04
Running transaction check				
Transaction check succeeded.				
Running transaction test				
Transaction test succeeded.				
Running transaction				
Preparing :				1/1
Running scriptlet: jenkins-2.462.2-1.1.noarch				1/1
Installing : jenkins-2.462.2-1.1.noarch				1/1
Running scriptlet: jenkins-2.462.2-1.1.noarch				1/1
Verifying : jenkins-2.462.2-1.1.noarch				1/1
Installed:				
jenkins-2.462.2-1.1.noarch				

## Install Jenkins on your Jenkins terminal

```
[root@jenkins ~]# wget -O /etc/yum.repos.d/jenkins.repo https://pkg.jenkins.io/redhat-stable/jenkins.repo
--2024-09-20 13:35:03-- https://pkg.jenkins.io/redhat-stable/jenkins.repo
Resolving pkg.jenkins.io (pkg.jenkins.io)... 199.232.46.133, 2a04:4e42:48::645
Connecting to pkg.jenkins.io (pkg.jenkins.io)|199.232.46.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 85
Saving to: '/etc/yum.repos.d/jenkins.repo'

/etc/yum.repos.d/jenkins.repo 100%[=====>] 85 --.-KB/s in 0s

2024-09-20 13:35:03 (1.90 MB/s) - '/etc/yum.repos.d/jenkins.repo' saved [85/85]
```

## Open the Jenkins server using the public ip of the instance

←

→

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⚠ Not secure 52.221.210.238:8080/login?from=%2F

☆

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📄

👤

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📁 LTMindtree Favorites Folder

👤 http://18.139.110.21...

🌐 Google Chrome isn't your default browser

Set as default

✕

Getting Started

# Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log ([not sure where to find it?](#)) and this file on the server:

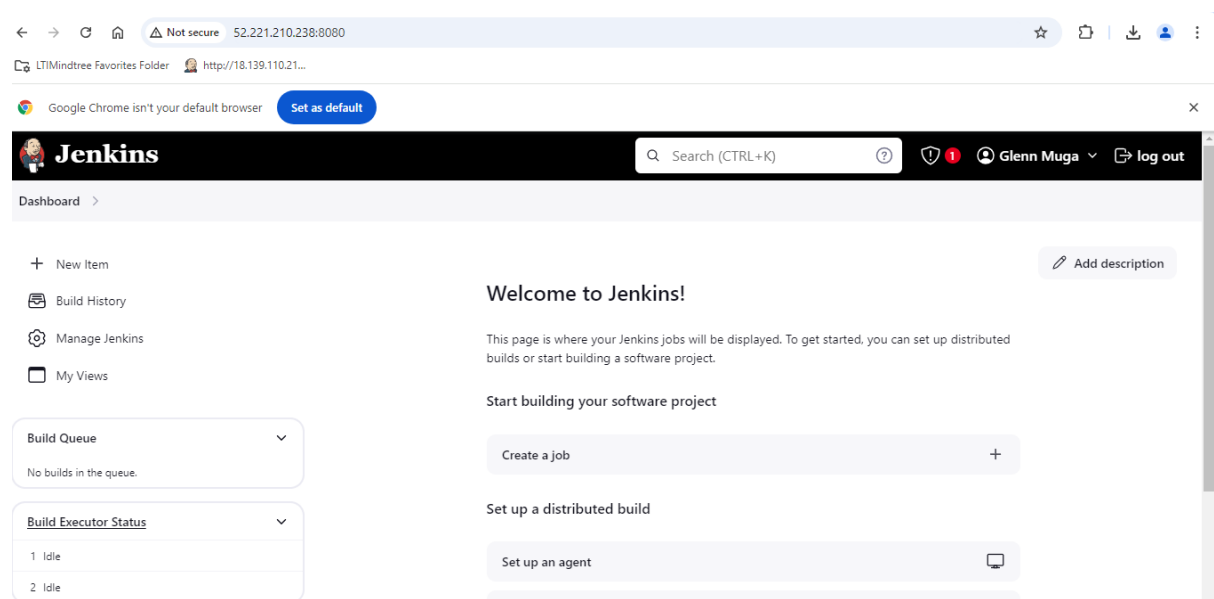
```
/var/lib/jenkins/secrets/initialAdminPassword
```

Please copy the password from either location and paste it below.

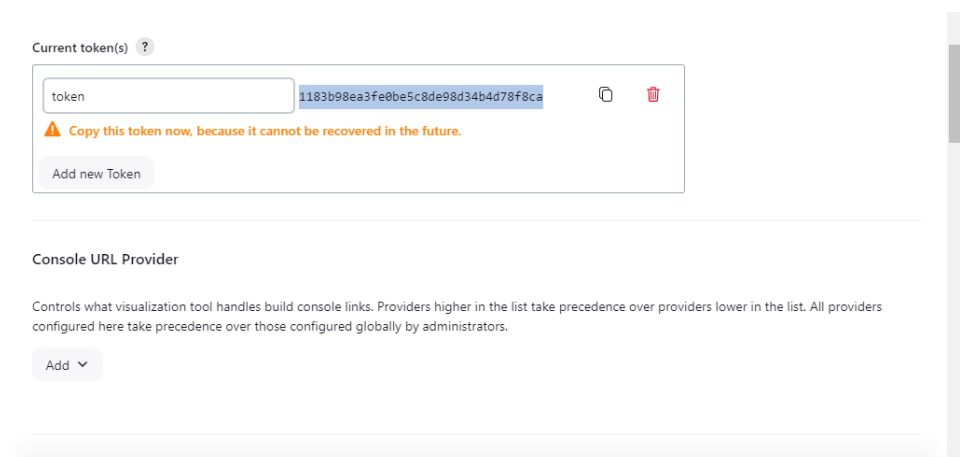
Administrator password

Continue

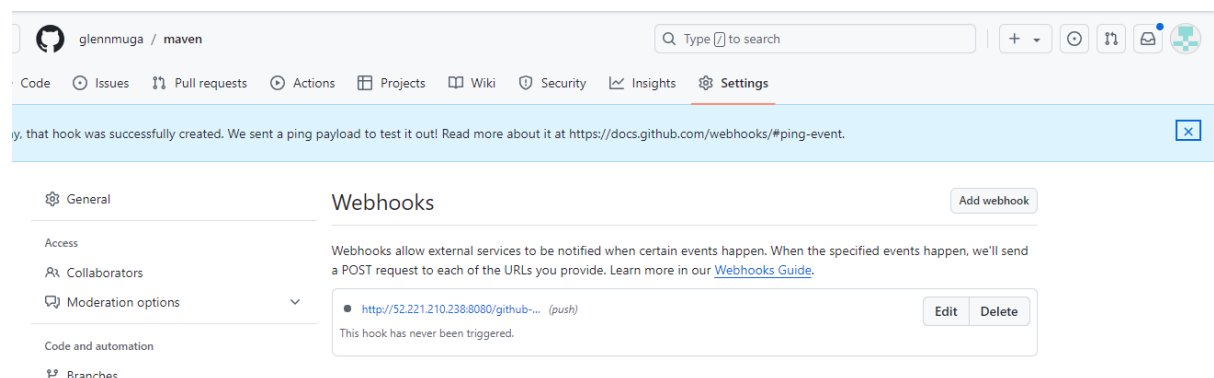
You can see we have now entered the Jenkins dashboard



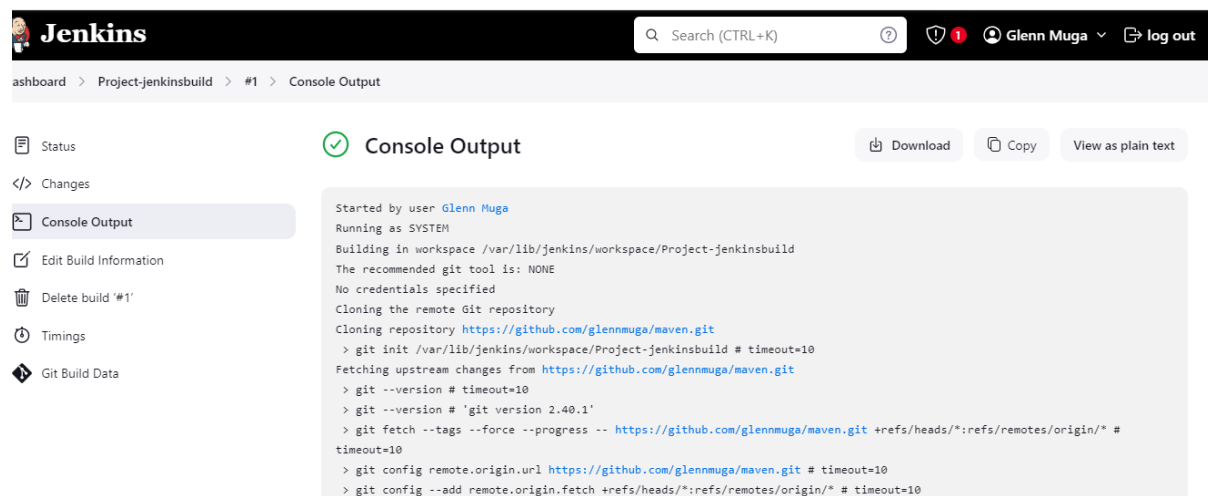
Create API token in Jenkins



To connect Jenkins with GitHub repository we need to add Webhooks



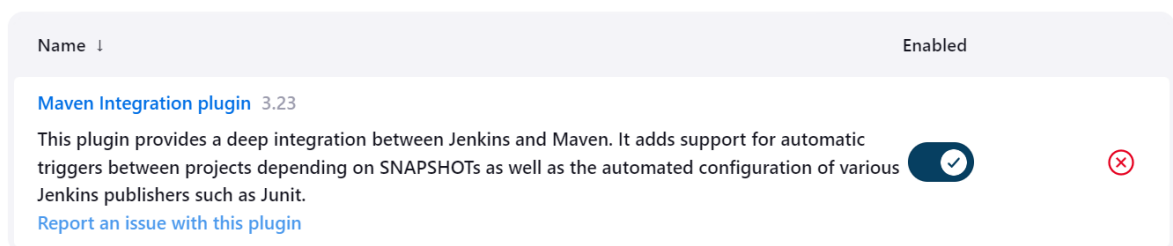
After adding the following we can build Jenkins and test the build is successful.



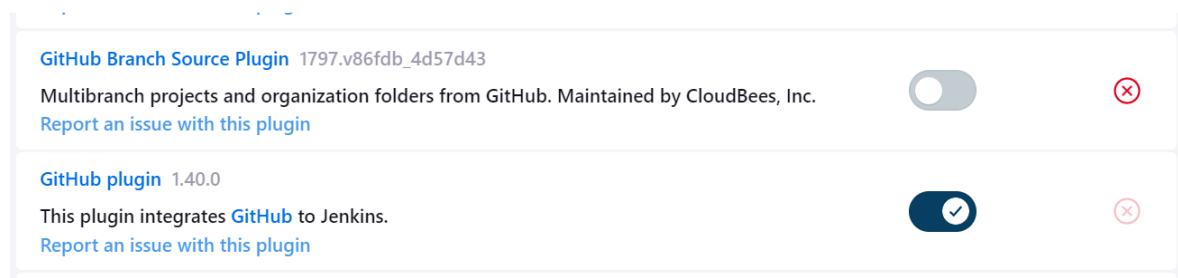
Now we will install maven on our server :

```
[root@ip-172-31-25-56 ~]# mvn -v
Apache Maven 3.8.4 (Red Hat 3.8.4-3.amzn2023.0.5)
Maven home: /usr/share/maven
Java version: 17.0.12, vendor: Amazon.com Inc., runtime: /usr/lib/jvm/java-17
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "6.1.109-118.189.amzn2023.x86_64", arch: "amd64",
```

In Jenkins> dashboard > manage Jenkins > available plugins > maven integration > install



In installed plugins > type github > disable github branch source plugin and enable github plugin.





After installing restart Jenkins

In Manage Jenkins add tools and paste the java and maven path from Jenkins-server

JDK installations ^ Edited

Add JDK

**JDK**

Name

java

JAVA\_HOME

/usr/lib/jvm/java-17-amazon-corretto.x86\_64

**Maven**

Name

maven

MAVEN\_HOME

/usr/share/maven

You can now build maven and see the successful build below , we have received our git repo modules as seen below

Dashboard > Project-mavenbuild > #1

Console Output

Edit Build Information

Delete build '#1'

Timings

Git Build Data

Redeploy Artifacts

Test Result

See Fingerprints

Started by user [Glenn Muga](#)

Started 1 min 1 sec.  
Took [18 sec](#)

This run spent:

- 33 ms waiting;
- 18 sec build duration;
- 18 sec total from scheduled to completion.

**git**

Revision: 717e79c68b7925f8d5d4c05cc5be52c3dc7033a8  
Repository: <https://github.com/glennmuga/maven.git>

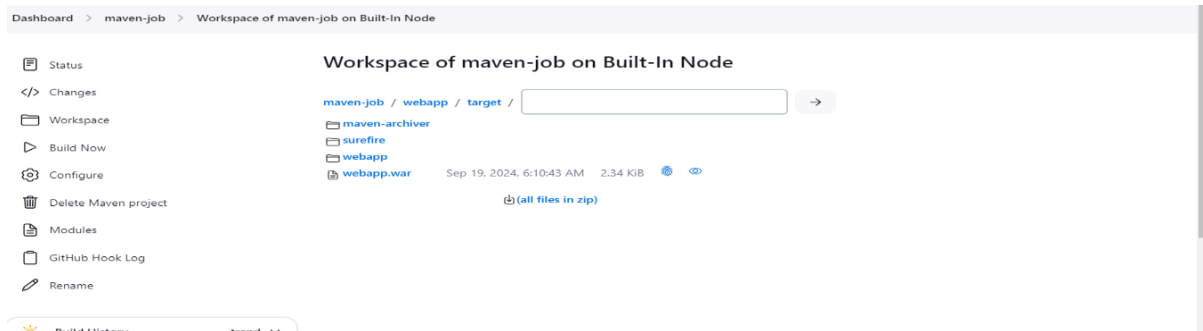
- refs/remotes/origin/main

**Test Result** (no failures)

**Module Builds**

✓ <a href="#">Maven Project</a>	2.4 sec
✓ <a href="#">Server</a>	5.1 sec
✓ <a href="#">Webapp</a>	3.3 sec

The webapp .war file is visible which indicates that maven is building artifacts successfully.



Now we will build Apache tomcat server

```
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
libpng-2:1.6.37-10.amzn2023.0.6.x86_64
pixman-0.40.0-3.amzn2023.0.3.x86_64

complete!
root@tomcatserver ~]# 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)
root@tomcatserver ~]#
```

Download the tomcat using wget command


```
[root@tomcatserver ~]# cd /opt
[root@tomcatserver opt]# wget https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.95/bin/apache-tomcat-9.0.95.tar.gz
--2024-09-20 14:00:03-- https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.95/bin/apache-tomcat-9.0.95.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: 12715996 (12M) [application/x-gzip]
Saving to: 'apache-tomcat-9.0.95.tar.gz'

apache-tomcat-9.0.95.tar.gz      100%[=====>] 12.13M  --.-KB/s  in 0.1s

2024-09-20 14:00:04 (88.4 MB/s) - 'apache-tomcat-9.0.95.tar.gz' saved [12715996/12715996]

[root@tomcatserver opt]#
```

Open tomcat using the public ip


LTIMindtree Favorites Folder  http://18.139.110.21...

Google Chrome isn't your default browser [Set as default](#)


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Home Documentation Configuration Examples Wiki Mailing Lists Find Help

## Apache Tomcat/9.0.95

 SOFTWARE FOUNDATION  
http://www.apache.org/

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



Recommended Reading:

[Security Considerations How-To](#)

[Manager Application How-To](#)

[Clustering/Session Replication How-To](#)

[Server Status](#)  
[Manager App](#)  
[Host Manager](#)

**Developer Quick Start**

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

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

**Managing Tomcat**

For security, access to the [manager webapp](#) is restricted. Users are defined in:

`$CATALINA_HOME/conf/tomcat-users.xml`

**Documentation**

[Tomcat 9.0 Documentation](#)

[Tomcat 9.0 Configuration](#)

[Tomcat MBeans](#)

**Getting Help**

[FAQ and Mailing Lists](#)

The following mailing lists are available:

[Tomcat users](#)

Add user's admin, deployer and assign roles using vim tomcat-users.xml

```

root@ip-172-31-41-242:~
root@jenkins-server:~
root@ip-172-31-41-5:/opt/aps

you must define such a user - the username and password are arbitrary.

Built-in Tomcat manager roles:
- manager-gui - allows access to the HTML GUI and the status pages
- manager-script - allows access to the HTTP API and the status pages
- manager-jmx - allows access to the JMX proxy and the status pages
- manager-status - allows access to the status pages only

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

<role rolename="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"/>
</tomcat-users>
57.9-1 Bot

```

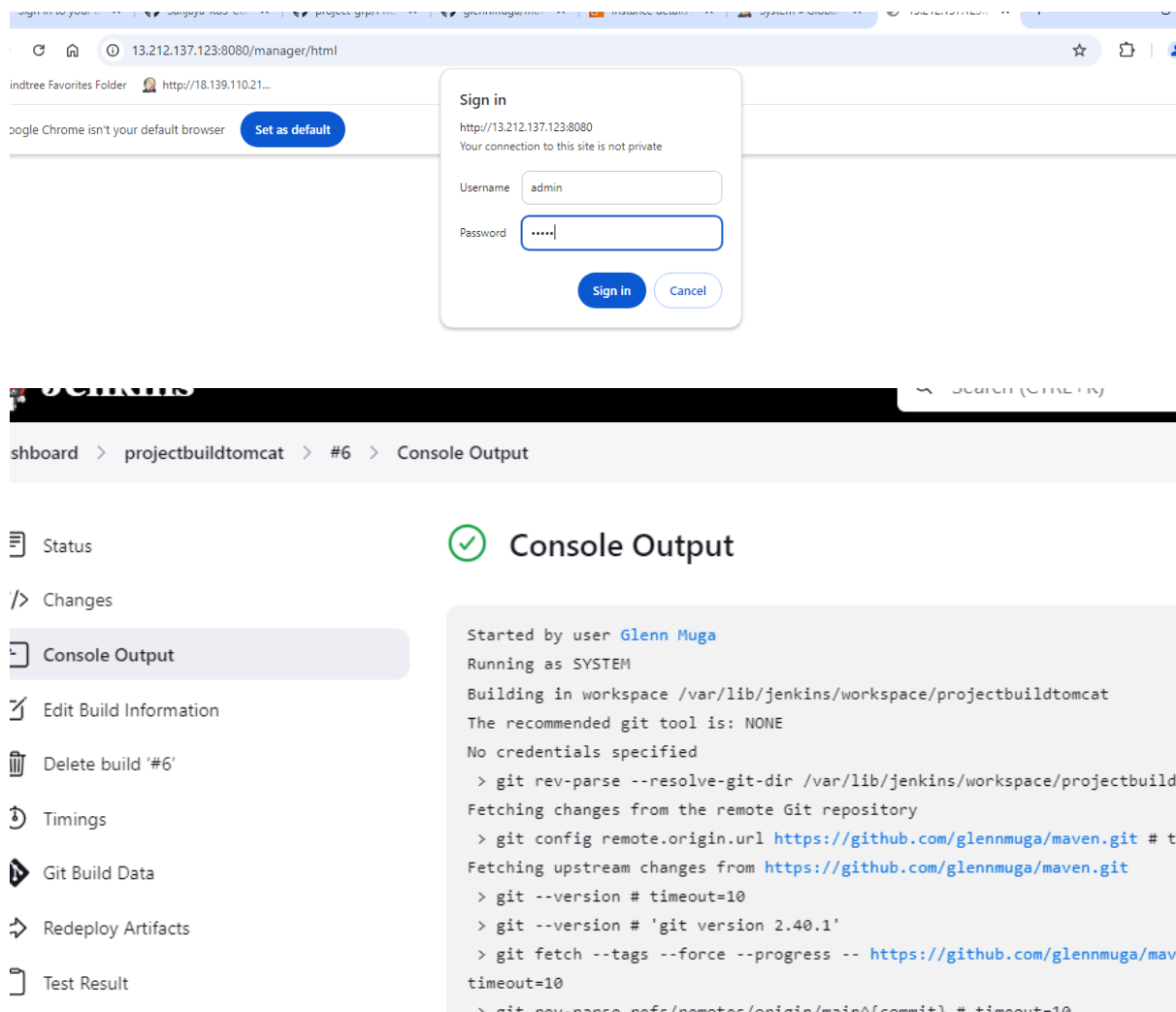
Shutdown and start the tomcat

```

[root@tomcat-server bin]# ./shutdown.sh
Using CATALINA_BASE:   /opt/apache-tomcat-9.0.95
Using CATALINA_HOME:   /opt/apache-tomcat-9.0.95
Using CATALINA_TMPDIR: /opt/apache-tomcat-9.0.95/temp
Using JRE_HOME:        /usr
Using CLASSPATH:        /opt/apache-tomcat-9.0.95/bin/bootstrap.jar:/opt/apache-tomcat-9.0.95/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.base/java.util.concurrent=ALL-UNNAMED --add-opens=java.rmi/sun.rmi.transport=ALL-UNNAMED
[root@tomcat-server bin]# ./startup.sh
Using CATALINA_BASE:   /opt/apache-tomcat-9.0.95
Using CATALINA_HOME:   /opt/apache-tomcat-9.0.95
Using CATALINA_TMPDIR: /opt/apache-tomcat-9.0.95/temp
Using JRE_HOME:        /usr
Using CLASSPATH:        /opt/apache-tomcat-9.0.95/bin/bootstrap.jar:/opt/apache-tomcat-9.0.95/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
[root@tomcat-server bin]#

```

## Now open the Apache tomcat server



Sign in to your account

13.212.137.123:8080/manager/html

indtree Favorites Folder <http://18.139.110.21...>

Google Chrome isn't your default browser [Set as default](#)

**Sign in**

<http://13.212.137.123:8080>

Your connection to this site is not private

Username

Password

[Sign in](#) [Cancel](#)

Dashboard > projectbuildtomcat > #6 > Console Output

Status

Changes

**Console Output**

Edit Build Information

Delete build '#6'

Timings

Git Build Data

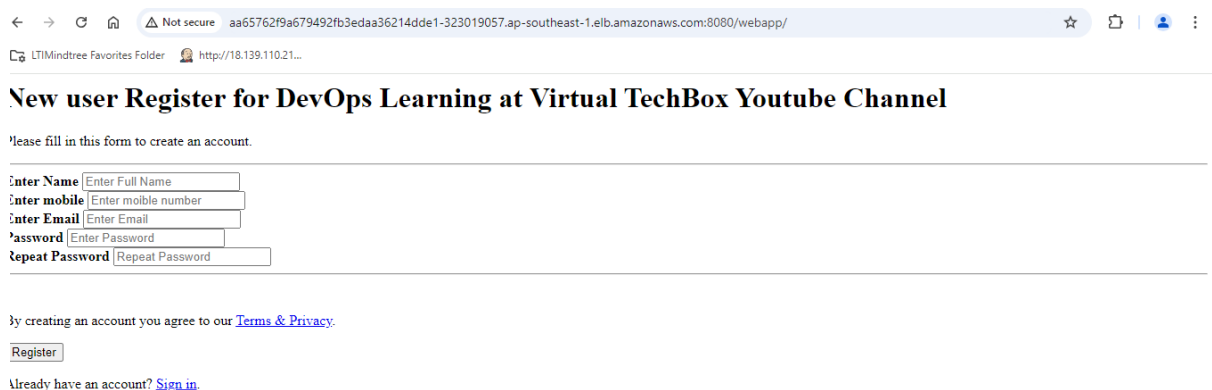
Redeploy Artifacts

Test Result

**Console Output**

```
Started by user Glenn Muga
Running as SYSTEM
Building in workspace /var/lib/jenkins/workspace/projectbuildtomcat
The recommended git tool is: NONE
No credentials specified
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/projectbuildtomcat
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/glennmuga/maven.git # t
Fetching upstream changes from https://github.com/glennmuga/maven.git
> git --version # timeout=10
> git --version # 'git version 2.40.1'
> git fetch --tags --force --progress -- https://github.com/glennmuga/mav
timeout=10
> git rev-parse refs/remotes/origin/main^{commit} # timeout=10
```

## Expose the web application on tomcat using public Ip on 8080 Port



← → ↻ 🏠 ⚠ Not secure aa65762f9a679492fb3edaa36214dde1-323019057.ap-southeast-1.elb.amazonaws.com:8080/webapp/ ☆ 📄 👤 ⋮

LTIMindtree Favorites Folder <http://18.139.110.21...>

## New user Register for DevOps Learning at Virtual TechBox Youtube Channel

Please fill in this form to create an account.

Enter Name

Enter mobile

Enter Email

Password

Repeat Password

By creating an account you agree to our [Terms & Privacy](#).

[Register](#)

Already have an account? [Sign in](#).

Thank You, Happy Learning

See You Again

```

Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa
Your public key has been saved in /root/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:P1+XPULh/1csuVzMeCc7gnL/x5qg3xJY8GKZwPxUHpo root@jenkins
The key's randomart image is:
----[RSA 3072]-----+
  o  .o  |
  + o+ .  |
  +E= . o  |
  * o .*o  |
  S. +  =.X|
  .....BB|
  . = o.*==|
  o =.= +=|
  ..+o=o  |
-----[SHA256]-----+
root@jenkins ~)#
root@jenkins ~)# vim /etc/ssh/sshd_config
root@jenkins ~)# systemctl restart sshd
root@jenkins ~)# cd .ssh
root@jenkins .ssh)# ls
authorized_keys  id_rsa  id_rsa.pub
root@jenkins .ssh)# ssh-copy-id root@172.31.38.21
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id_rsa.pub"
The authenticity of host '172.31.38.21 (172.31.38.21)' can't be established.
ED25519 key fingerprint is SHA256:Vdz8UKig67bptV4AYxRXwjg508kHxkbftfXTV7r5Cks.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new ones
root@172.31.38.21's password:

```

Create global credentials for tomcat server in Jenkins machine

To integrate tomcat server with Jenkins:

Go to Manage Jenkins > plugin > available plugins > deploy to container > install

Manage Jenkins > Credentials > system > global credentials > add

Username: deployer

Password: deployer

## Global credentials (unrestricted)

[+ Add Credentials](#)

Credentials that should be available irrespective of domain specification to requirements matching.

ID	Name	Kind	Description
 <a href="#">137aa83f-0213-4267-ac9d-12c057a6258f</a>	deployer/*****	Username with password	

Icon: S M L





## Docker server

### Launch docker server

Services

Search

[Alt+S]

Singapore

glenn\_muga

Dashboard

Global View

Instances

Instance Types

Instance Templates

Instance Profiles

Instance Plans

Instance Groups

Instance Profiles

Instance Hosts

Instances (1/8) Info

Last updated less than a minute ago

Connect

Instance state

Actions

Launch instances

Find Instance by attribute or tag (case-sensitive)

All states

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability
<input type="checkbox"/>	Git_server	i-0c2c070ea1d3181e0	Running	t2.micro	2/2 checks passed	View alarms	ap-southeast-1
<input type="checkbox"/>	Tomcat_server	i-01e8ca1f38387187c	Running	t2.micro	2/2 checks passed	View alarms	ap-southeast-1
<input type="checkbox"/>	Jenkins_server	i-03de8dc53ad6ef20d	Running	t2.medium	2/2 checks passed	View alarms	ap-southeast-1
<input checked="" type="checkbox"/>	docker_project	i-0ce2614b333ccbcf4	Running	t2.medium	2/2 checks passed	View alarms	ap-southeast-1
<input type="checkbox"/>	myg-cluster-m...	i-037cbe693277ba02d	Running	t2.small	2/2 checks passed	View alarms	ap-southeast-1
<input type="checkbox"/>	Kubernetes_pr...	i-0e89427ebcdc72f3e	Running	t2.micro	2/2 checks passed	View alarms	ap-southeast-1
<input type="checkbox"/>	myg-cluster-m...	i-09d45ddbda538e55	Running	t2.small	2/2 checks passed	View alarms	ap-southeast-1

### Install docker and start the service

```
Created symlink /etc/systemd/system/sockets.target.wants/docker.socket → /usr/lib/systemd/system/docker.socket.

Verifying : containerd-1.7.20-1.amzn2023.0.1.x86_64 1/10
Verifying : docker-25.0.6-1.amzn2023.0.2.x86_64 2/10
Verifying : iptables-libs-1.8.8-3.amzn2023.0.2.x86_64 3/10
Verifying : iptables-nft-1.8.8-3.amzn2023.0.2.x86_64 4/10
Verifying : libcgrouper-3.0-1.amzn2023.0.1.x86_64 5/10
Verifying : libnetfilter_conntrack-1.0.8-2.amzn2023.0.2.x86_64 6/10
Verifying : libnftnl-1.0.1-19.amzn2023.0.2.x86_64 7/10
Verifying : libnftnl-1.2.2-2.amzn2023.0.2.x86_64 8/10
Verifying : pigz-2.5-1.amzn2023.0.3.x86_64 9/10
Verifying : runc-1.1.13-1.amzn2023.0.1.x86_64 10/10

Installed:
containerd-1.7.20-1.amzn2023.0.1.x86_64      docker-25.0.6-1.amzn2023.0.2.x86_64      iptables-libs-1.8.8-3.amzn2023.0.2.x86_64
iptables-nft-1.8.8-3.amzn2023.0.2.x86_64    libcgrouper-3.0-1.amzn2023.0.1.x86_64    libnetfilter_conntrack-1.0.8-2.amzn2023.0.2.x86_64
libnftnl-1.0.1-19.amzn2023.0.2.x86_64      libnftnl-1.2.2-2.amzn2023.0.2.x86_64    pigz-2.5-1.amzn2023.0.3.x86_64
runc-1.1.13-1.amzn2023.0.1.x86_64

Complete!
[root@docker ~]# sudo service docker start
Redirecting to /bin/systemctl start docker.service
[root@docker ~]#
```

```

complete!
[root@docker ~]# sudo service docker start
Redirecting to /bin/systemctl start docker.service
[root@docker ~]# docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
[root@docker ~]# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa
Your public key has been saved in /root/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:9r0W0WgIkFRMsh05nX8mJNQ/VNVlN1VyKyosAyGFE4c root@docker
The key's randomart image is:
+-----[RSA 3072]-----+
|  o*OB.o   ...oo@|
| . E*.= o .   +=|
| + oo + o   . . |
| . . + = . . |
| . oS* o     |
| . oo+.     |
| . = +      |
| . + o      |
| . .        |
+-----[SHA256]-----+
[root@docker ~]#

```

Do SSH-KEYGEN to connect the server with docker server

```

Last login: Fri Sep 20 13:49:15 2024 from 167.103.3.72
[ec2-user@jenkins ~]$ ssh-keygen
Generating public/private rsa key pair.

Enter file in which to save the key (/home/ec2-user/.ssh/id_rsa): Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ec2-user/.ssh/id_rsa
Your public key has been saved in /home/ec2-user/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:LymVC9bdkps2CRyTiYddaY6jz69GZFk5srCW02qcBHU ec2-user@jenkins
The key's randomart image is:
+-----[RSA 3072]-----+
| ..+E+.o |
| . +++=*o |
| .o**O+.. |
| .**O=.= |
| +.BS.B  |
| * .o .   |
| . +      |
| +        |
| ..o.     |
+-----[SHA256]-----+
[ec2-user@jenkins ~]$

```

Configure AWS

```

+-----[SHA256]-----+
[root@docker ~]# aws configure
AWS Access Key ID [None]: AKIA2HVQ5KTOIQPDURGS
AWS Secret Access Key [None]: 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
Default region name [None]: ap-southeast-1
Default output format [None]:
[root@docker ~]#

```

## Copy public Ip address of Jenkins in docker

## Copy public Ip address of Jenkins, docker in Jenkins

```
====[SHA256]====+
root@docker .ssh)# cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGCYRkZ6TFXpEZQWfal3QiiGok5e5gE1BmkqZ7tEBM3n18CisgRPY3Am2eyiVeQcVPxCOCbbLEZ0CD6kdc0UrysJRrunBgva7EvomsC8r/cANDL
dJZDkcxCNLhY4jG5UMhgGyCizyJ58z//iQPYRZuIH9ct79ZiRJBujr7FEGVnmC2weCwNtH+50tgAd7Veqlzk+kpswbQGB0Nt1CQ0dUEW4Gnu6dVlSLeAOvC+CnN21A28b0iM9oPaD42XQsDzCS8
MB9AIPsAdnhH5SssRgLPpV6JLV/vKw+1HQ796iYLMPM3XUEKEOpNgDKuc08Rr0XDJCVbtCHZJSeQ84AJVgsbqRItnrNaKq8LjB7ZsvQQyuULrbBH4rj8Cx5I7EdcfW7MLCgZLQ5xtaV6E7GnvM
ZlbPAfpajZoloA34P80mNf+4cDHqTWVBrsVlwbDm6qud72mmCQZAKr9vAhXXfV4w9sabteV3Ku1QFzcj3/EOPbBv375hKya50cLChdwLM= root@docker

root@docker .ssh)# ls
authorized_keys id_rsa id_rsa.pub
root@docker .ssh)# cat authorized_keys
no-port-forwarding,no-agent-forwarding,no-X11-forwarding,command="echo 'Please login as the user \"ec2-user\" rather than the user \"root\".';echo;s
leep 10;exit 142" ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCNLFyOBH8y5CtTL4khOLAqDkoCwmNTwtz8D7pFtkPA4rEUjYN72g14cGgDmRuifci6yZ+c3zfGohPmBzHcjzxZ5V650
T77Fnd/ZJvI3882x1QUJv35wv0s4KLz/LuLj/N6g7D0pXHX1KLqjgwLzjzLt/Jmm2xmNt7vAQGZMe+jcBb7zn8SIyk01DBPHYOVtN+EkgnZ26tWfrMo7iWdZMPQK5ravpZfDbkD0HuN5eTQ/GL
hKf3/vl0GuahWi8NaWsDw3sHtyF70MwK9AaBybX0bt1GBs3Nltg17Vw+VnJialVi7MyVLaVCQ5jIiK29oe1B5T31vdMSZx6tMXFWnd project1-key-pair
root@docker .ssh)# vim authorized_keys
root@docker .ssh)# cd
root@docker ~)# ping 172.31.35.236
```

```
[root@jenkins .ssh]# cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGChtBVPA/DBaAWOpulqNtW0QpoBLnOmEGh60hC4yww+4YCT2jlcIU61drBGyWAVG9f9cWgRLr3Y2uiaBFXFedf9IMJv9UkoTUqy+FqWJ3fpaW2AL
Cie2rqZaZEPzX0RnmaslNppluAdepQVci+7zL8T81TV0q1b8QGF2/grsE8gZVmkyssvQf6rKp2/Vvh7F3dkfBUa8rU3W1mxKV3B2FhDu7xpHnJyjdNN85C4t+RXB0w+POBBYDkvyFxB0N4otHszT
sVXpA//UV5+5aP4UqavRb7P1JN4rW4mAmbOy+szQON6bWxMhZM7eJvABoIt7aEUvdyjRiekM5BPQsXyMxcLWwBnXoQG8LLw91dUuESBBLqZyWVM0q9gby+u7J2Zy22A9uK0JLKqcdTbpS3jltwE6
MqJ3M3V47hpjYk50swXQ9nX1cPnnXtJddWiF9C62sIITEKczhn8uhvJb09/XcS1ACBNpppyZLTJJu2tNqP3bWssKrmxS/c08B2ztNbGxdrK= root@jenkins

[root@jenkins .ssh]# cat authorized_keys
no-port-forwarding,no-agent-forwarding,no-X11-forwarding,command="echo 'Please login as the user \"ec2-user\" rather than the user \"root\".';echo;s
leep 10;exit 142" ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCNLFyOBH8y5CtTL4khOLAqDkoCwmNTwtz8D7pFtkPA4rEUjYN72g14cGgDmRuifci6yZ+c3zfGohPmBzHcjzxZ5V650
BT77Fnd/ZJvI3882x1QUJv35wv0s4KLz/LuLj/N6g7D0pXHX1KLqjgwLzjzLt/Jmm2xmNt7vAQGZMe+jcBb7zn8SIyk01DBPHYOVtN+EkgnZ26tWfrMo7iWdZMPQK5ravpZfDbkD0HuN5eTQ/GL
hKf3/vl0GuahWi8NaWsDw3sHtyF70MwK9AaBybX0bt1GBs3Nltg17Vw+VnJialVi7MyVLaVCQ5jIiK29oe1B5T31vdMSZx6tMXFWnd project1-key-pair
[root@jenkins .ssh]# vim authorized_keys
[root@jenkins .ssh]# vim authorized_keys
[root@jenkins .ssh]# cd
[root@jenkins ~]# ping 172.31.38.21
PING 172.31.38.21 (172.31.38.21) 56(84) bytes of data.
 64 bytes from 172.31.38.21: icmp_seq=1 ttl=127 time=2.74 ms
 64 bytes from 172.31.38.21: icmp_seq=2 ttl=127 time=1.28 ms
 64 bytes from 172.31.38.21: icmp_seq=3 ttl=127 time=0.989 ms
^Z
[4]+  Stopped                  ping 172.31.38.21
```

Now we can ping the terminals of each other and check the terminals are connecte

```
[root@docker ~]# ping 172.31.35.236
PING 172.31.35.236 (172.31.35.236) 56(84) bytes of data.
 64 bytes from 172.31.35.236: icmp_seq=1 ttl=127 time=0.902 ms
 64 bytes from 172.31.35.236: icmp_seq=2 ttl=127 time=0.757 ms
 64 bytes from 172.31.35.236: icmp_seq=3 ttl=127 time=1.11 ms
 64 bytes from 172.31.35.236: icmp_seq=4 ttl=127 time=0.880 ms
^Z
[1]+  Stopped                  ping 172.31.35.236
root@docker ~]# |
```

```
into /root/.ssh/authorized_keys/01 scope tim
valid_lft forever preferred_lft forever
[root@jenkins .ssh]# ssh-copy-id root@172.31.35.236
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id_rsa.pub"
The authenticity of host '172.31.35.236 (172.31.35.236)' can't be established.
ED25519 key fingerprint is SHA256:1wLRI/m3/MBmWtHNTIpzUKCONsMmSL+9APS9zptx0e90.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
root@172.31.35.236's password:

Number of key(s) added: 1

Now try logging into the machine, with:  "ssh 'root@172.31.35.236'"
and check to make sure that only the key(s) you wanted were added.

[root@jenkins .ssh]# cat authorized_keys
no-port-forwarding,no-agent-forwarding,no-X11-forwarding,command="echo 'Please login as the user \"ec2-user\" rather than the user \"root\".';echo;s
leep 10;exit 142" ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCNLFyOBH8y5CtTL4khOLAqDkoCwmNTwtz8D7pFtkPA4rEUjYN72g14cGgDmRuifci6yZ+c3zfGohPmBzHcjzxZ5V650
BT77Fnd/ZJvI3882x1QUJv35wv0s4KLz/LuLj/N6g7D0pXHX1KLqjgwLzjzLt/Jmm2xmNt7vAQGZMe+jcBb7zn8SIyk01DBPHYOVtN+EkgnZ26tWfrMo7iWdZMPQK5ravpZfDbkD0HuN5eTQ/GL
hKf3/vl0GuahWi8NaWsDw3sHtyF70MwK9AaBybX0bt1GBs3Nltg17Vw+VnJialVi7MyVLaVCQ5jIiK29oe1B5T31vdMSZx6tMXFWnd project1-key-pair
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGCgCh3Et/b2zMs72UNVpApsAYMdqBrw1EWM839NXCLd9cd185c8EexeNDX/sc7H5mVq1UT9LdqkXU7/NhkTbxW2xtJ8zw0I0N2L+soaM20FDRMp
RFQpMLXV/ddxFS6/JZJQz45BmqSpIrrhu4azYbLiHb1M2nd7hx8nLuMp9mhwTK42T2LhJYMMXQ8KASldjOkmLNRDplxQeVVgtgtuq+iiFMyBGH6oDVn+SSCBWWhv12VwdE03eod0878b6Fwk8La
Nq/GWiKndAiD8P8GUpMw2UJJuAa+HvrSAscGL2D1C85CrVML2aGAKdJhG6wqZ3U3cyHncMEeH83xq/pKdyp/EQVPRXPcrLIgWxGw20qIIdopHAJX87L30KtmtkCqHzgBGmOQR2Cqzp/DwKm
hOCVa/qk0OemWUblsblFX2v9Lm67Mi+FCIP9BzCFcdXuEYkVf16n/d/BcdxnhhZfcl2ej7KZcKkyF3W8XY1iQjEVFSr/5xL3fHprazP6ec= root@docker
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGCgLBec/+a2k0+EFuaDdCbQZpH3ghruoXkUBLnNrcCjtnIdT520LEvt06QkXIC4CNLS9dyfCdm13JEX7TMZLkky75XS9m15fgqnaPnUFD8RbF
a0gZzV8JvLYRpT/4D9A0sQ89LUUwQJuaVAU1v3pdmLidRnm0731aNaSI/obv5XU5ctfa+tuuqnm4FiZi3uHapclY7R0gwiaCgx5h6hF+AiHdVfYZ7DLYPSzQuTRjft2vhov5j39VHdClxeH6EA
ud0aQ6sJp1uzwhkhtkQ2h4vC9+8TgCkTQciJE0SLqdM2ZL6dqtHbvqp2UvVm4NsYwzPZmpA1okxSkPp5EuTmzHc2RQ0GgUly1ji5f2qizN6rCox50VxY22eHD+ChagR11Nlqg+Yfr2Z798Hnmk9z
1X15rgc1A2evnkpilF3t5qLJxwD7UBFAIhsm6r5PLMpsOARruau+vLkEIQPHUT/G+wsD5cGTA0k0XFacnN5MLTYZ5FNIDaMo985E1Ek= root@jenkins
```



```
[root@docker ~]# vim /etc/ssh/sshd_config
[root@docker ~]# systemctl restart sshd
[root@docker ~]# ip a s
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enX0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 9001 qdisc mq state UP group default qlen 1000
    link/ether 06:67:44:63:19:fd brd ff:ff:ff:ff:ff:ff
    altname eni-072069ec1693257f9
    altname device-number-0.0
    inet 172.31.38.21/20 metric 512 brd 172.31.47.255 scope global dynamic enX0
        valid_lft 3295sec preferred_lft 3295sec
    inet6 fe80::467:44ff:fe63:19fd/64 scope link
        valid_lft forever preferred_lft forever
3: docker0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default
    link/ether 02:42:dc:35:28:ce brd ff:ff:ff:ff:ff:ff
    inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
        valid_lft forever preferred_lft forever
[root@docker ~]# cd .ssh
[root@docker .ssh]# ssh-copy-id root@172.31.35.236
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id_rsa.pub"
The authenticity of host '172.31.35.236 (172.31.35.236)' can't be established.
ED25519 key fingerprint is SHA256:1wLRi/mJ/MBmwHN7IpzUKCONsMmSL+9APS9zptx0e90.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
root@172.31.35.236's password:

Number of key(s) added: 1

Now try logging into the machine, with:  "ssh 'root@172.31.35.236'"
```

```
[root@docker ~]# sudo service docker start
Redirecting to /bin/systemctl start docker.service
[root@docker ~]# docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
[root@docker ~]# docker images
REPOSITORY      TAG                IMAGE ID            CREATED             SIZE
project-devops   latest             dd08530fc78d        About a minute ago  474MB
039612846272.dkr.ecr.ap-southeast-1.amazonaws.com/project-devops   latest             dd08530fc78d        About a minute ago  474MB
[root@docker ~]# docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
[root@docker ~]# cd /opt
[root@docker opt]# ll
```

Add ssh server of Jenkins and docker in Jenkins dashboard to connect terminal to jenkins

---

Publish over **SSH**

Jenkins **SSH** Key ?

Passphrase ?

Concealed
 Change Password

Path to key ?

Key ?

```
-----BEGIN OPENSSH PRIVATE KEY-----
b3BlnNzaC1rZXktjdEAAAAABG5vbmUAAAEbm9uZQAAAAAAAAABAAABlwAAAAAdzc2gtcn
NhAAAAAwEAAQAAAYEAoJWxHP/mtPNPhBbm93Qm0FGaR94la7qF5FA5S5za3Ao7ZyHU+dtCx
FbTukJFyAuAjS7PXcnwnZpdyRF+0zGZZJMu+V0vZteX4KKp2j51HxQ0WxWjoGc1fHSb5WE
-----
```

SSH Server

Name ?  
Docker

Hostname ?  
172.31.38.21

Username ?  
root

Dashboard > Manage Jenkins > System >

SSH Server

Name ?  
Jenkins

Hostname ?  
172.31.35.236

Username ?  
root

Remote Directory ?  
/root

☐ Avoid sending files that have not changed ?

Advanced

From post build actions select build artifacts over ssh

we are connecting Jenkins with docker by providing docker IP

Remote directory ?

Exec command ?  
rsync -avh /var/lib/jenkins/workspace/projectbuildtomcat/\* root@172.31.38.21:/opt

All of the transfer fields (except for Exec timeout) support substitution of [Jenkins environment variables](#)

Advanced

## The commands for creating the image and pushing image into ECR

Exec command ?

```
aws ecr get-login-password --region ap-southeast-1 | docker login --username AWS --password-stdin 039612846272.dkr.ecr.ap-southeast-1.amazonaws.com
docker build -t project-devops .
docker tag project-devops:latest 039612846272.dkr.ecr.ap-southeast-1.amazonaws.com/project-devops:latest
docker push 039612846272.dkr.ecr.ap-southeast-1.amazonaws.com/project-devops:latest
```

All of the transfer fields (except for Exec timeout) support substitution of [Jenkins environment variables](#)

### Tomcat 9.x Remote

Credentials

deployer/\*\*\*\*\*

+ Add

Tomcat URL ?

http://13.212.137.123:8080/

Advanced

Add Container

☐ Deploy on failure

## Build again and see build is successful

Dashboard > projectbuildtomcat > #17 > Console Output

Status

Changes

**Console Output**

Edit Build Information

Delete build '#17'

Polling Log

Timings

Git Build Data

Redeploy Artifacts

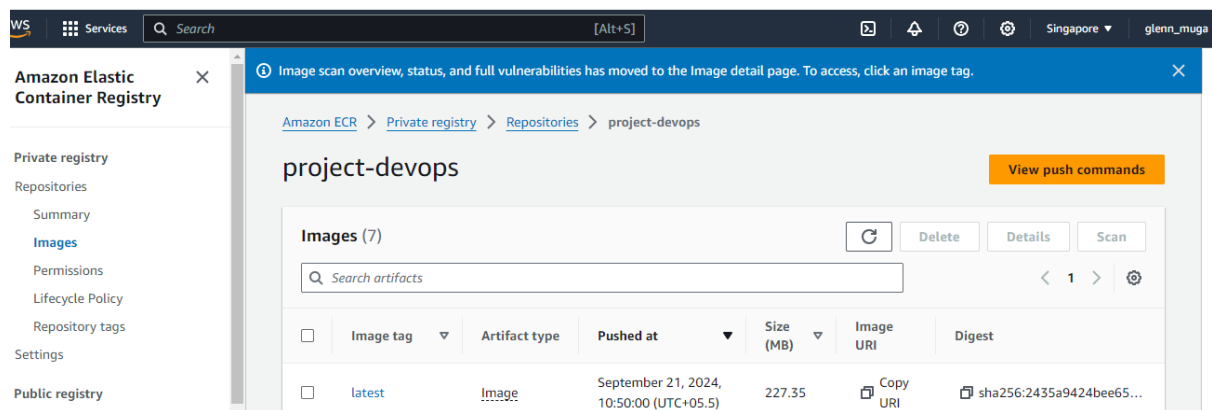
Test Result

Console Output

Download Copy

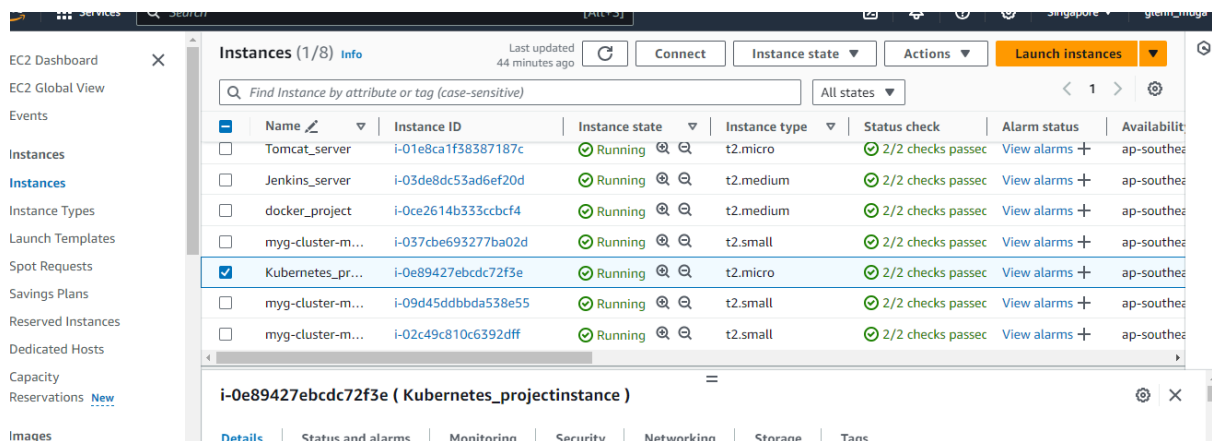
```
Started by GitHub push by glennmuga
Running as SYSTEM
Building in workspace /var/lib/jenkins/workspace/projectbuildtomcat
The recommended git tool is: NONE
No credentials specified
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/projectbuildtomcat/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/glennmuga/maven.git # timeout=10
Fetching upstream changes from https://github.com/glennmuga/maven.git
> git --version # timeout=10
> git --version # 'git version 2.40.1'
> git fetch --tags --force --progress -- https://github.com/glennmuga/maven.git +refs/heads/*:refs/remotes/
timeout=10
> git rev-parse refs/remotes/origin/main^{commit} # timeout=10
Checking out Revision fa30a6ea8ab392d2d26cbb9fc6475abd08a7379 (refs/remotes/origin/main)
```

Image is successfully pushed into ECR

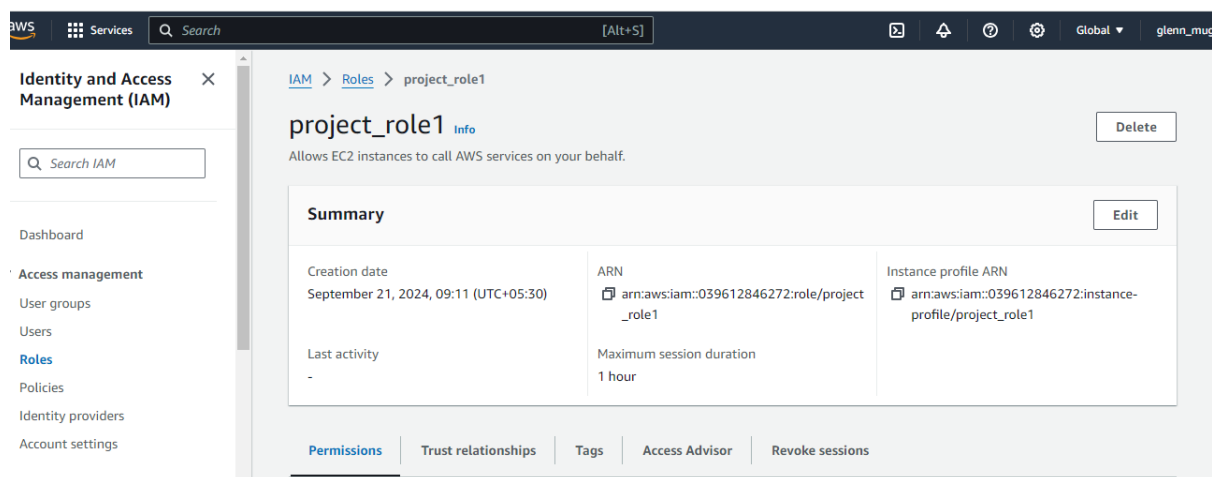


## Kubernetes cluster

Launch the Kubernetes server



Attach the role to the Kubernetes instance with the access to permissions of eks, elasticcontairregistry and iam full access.



```
[ec2-user@ip-172-31-44-151 ~]$ sudo su -
[root@ip-172-31-44-151 ~]# hostnamectl set-hostname kubernetes
[root@ip-172-31-44-151 ~]# bash
[root@kubernetes ~]# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa
Your public key has been saved in /root/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:x0K4vpksweUMhpN535u0zBsXJl2D0+ojFX0Xs8rYyPg root@kubernetes
The key's randomart image is:
+----[RSA 3072]-----+
|
| . o .
| + . * = +
| = + .+ O o o
| = *o.S o .
| o.+B.O .
| . = Bo+
| .+ Xo.
| .XoE
|
+-----[SHA256]-----+
[root@kubernetes ~]# yum update -y
```

## Configure AWS

```
You can now run: /usr/local/bin/aws --version
[root@kubernetes ~]# aws configure
AWS Access Key ID [None]: AKIAQSOI4CDAIFRIMSPX
AWS Secret Access Key [None]: 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
Default region name [None]: ap-southeast-1
Default output format [None]: table
[root@kubernetes ~]# curl --silent --location "https://github.com/weaveworks/eksctl/releases/latest/download/eksctl_${uname -s}_amd64.tar.gz" | tar
xz -C /tmp
[root@kubernetes ~]# sudo mv /tmp/eksctl /usr/local/bin
[root@kubernetes ~]# eksctl version
0.190.0
```

Aws user has been configured here through access key and secret key generated in the AWS console.

## Install EKSCTL and KUBECTL

Create EKS cluster with a name, region, subnets and without nodes.

```
[root@kubernetes ~]# curl -LO https://storage.googleapis.com/kubernetes-release/release/$(curl -s https://storage.googleapis.com/kubernetes-release/stable.txt)/bin/linux/amd64/kubectl
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 53.7M 100 53.7M 0 0 12.8M 0 0:00:04 0:00:04 --:--:-- 12.8M
[root@kubernetes ~]# sudo install -o root -g root -m 0755 kubectl /usr/local/bin/kubectl
[root@kubernetes ~]# kubectl version --client
Client Version: v1.31.0
Kustomize Version: v5.4.2
[root@kubernetes ~]# eksctl create cluster --name myg-cluster --region ap-southeast-1 --version 1.29 --vpc-public-subnets subnet-0d9b6911e1d6682
ubnet-04aafe39cb446a1a1 --without-nodegroup
2024-09-21 03:56:25 [I] eksctl version 0.190.0
2024-09-21 03:56:25 [I] using region ap-southeast-1
2024-09-21 03:56:25 [I] using existing VPC (vpc-00d163923f3f54b32) and subnets (private:map[] public:map[ap-southeast-1a:{subnet-04aafe39cb446a1a
ap-southeast-1a 172.31.32.0/20 0 } ap-southeast-1b:{subnet-0d9b6911e1d66829 ap-southeast-1b 172.31.16.0/20 0 }])
2024-09-21 03:56:25 [I] custom VPC/subnets will be used; if resulting cluster doesn't function as expected, make sure to review the configuratio
n VPC/subnets
2024-09-21 03:56:25 [I] using Kubernetes version 1.29
2024-09-21 03:56:25 [I] creating EKS cluster "myg-cluster" in "ap-southeast-1" region with
2024-09-21 03:56:25 [I] if you encounter any issues, check CloudFormation console or try 'eksctl utils describe-stacks --region=ap-southeast-1 --c
uster=myg-cluster'
2024-09-21 03:56:25 [I] Kubernetes API endpoint access will use default of {publicAccess=true, privateAccess=false} for cluster "myg-cluster" in
ap-southeast-1"
2024-09-21 03:56:25 [I] CloudWatch logging will not be enabled for cluster "myg-cluster" in "ap-southeast-1"
2024-09-21 03:56:25 [I] you can enable it with 'eksctl utils update-cluster-logging --enable-types={SPECIFY-YOUR-LOG-TYPES-HERE (e.g. all)} --re
gion=ap-southeast-1 --cluster=myg-cluster'
2024-09-21 03:56:25 [I] default addons vpc-cni, kube-proxy, coreDNS were not specified, will install them as EKS addons
2024-09-21 03:56:25 [I]
```

## Create node group

```
[root@kubernetes ~]# eksctl create nodegroup --cluster pro-cluster --region ap-south-1 --name my-node-group --node-ami-family Ubuntu2004 --node-type t2.small --subnet-ids subnet-0b85fc64db0bb9227,subnet-0f87e8992a2e28e8f --nodes 3 --nodes-min 2 --nodes-max 4 --ssh-access --ssh-public-key /root/.ssh/id_rsa.pub
2024-09-21 10:04:18 [i] will use version 1.29 for new nodegroup(s) based on control plane version
2024-09-21 10:04:20 [i] nodegroup "my-node-group" will use "ami-9ab6dcbf35da95038" [Ubuntu2004/1.29]
2024-09-21 10:04:20 [i] using SSH public key "/root/.ssh/id_rsa.pub" as "eksctl-pro-cluster-nodegroup-my-node-group-81:5c:62:2a:10:ce:ef:9e:89:8f:0f:db:05:0d:09:35"
2024-09-21 10:04:21 [i] 1 existing nodegroup(s) (my-node-group) will be excluded
2024-09-21 10:04:21 [i]
2 sequential tasks: { fix cluster compatibility, no tasks
}
2024-09-21 10:04:21 [i] checking cluster stack for missing resources
2024-09-21 10:04:21 [i] cluster stack has all required resources
2024-09-21 10:04:21 [i] no tasks
2024-09-21 10:04:21 [i] created 0 nodegroup(s) in cluster "pro-cluster"
2024-09-21 10:04:21 [i] created 0 managed nodegroup(s) in cluster "pro-cluster"
2024-09-21 10:04:21 [i] checking security group configuration for all nodegroups
2024-09-21 10:04:21 [i] all nodegroups have up-to-date cloudformation templates
```

## Create a deployment file

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: gm-deployment
  labels:
    app: regapp
spec:
  replicas: 2
  selector:
    matchLabels:
      app: regapp
  template:
    metadata:
      labels:
        app: regapp
    spec:
      containers:
        - name: regapp
          image: 039612846272.dkr.ecr.ap-southeast-1.amazonaws.com/project-devops:latest
          imagePullPolicy: Always
          ports:
            - containerPort: 8080
```

## Create a service file

```
apiVersion: v1
kind: Service
metadata:
  name: my-service
  labels:
    app: webapp
spec:
  selector:
    app: webapp
  ports:
    - port: 8080
      targetPort: 8080
  type: LoadBalancer
```

Apply the both files

Kubectl apply -f deployment.yaml

Kubectl apply -f service.yaml

Check the deployment and services

```
[root@kubernetes ~]# kubectl get deployment
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
my-project-deployment 2/2     2             2            17m

[root@kubernetes ~]# kubectl get service
NAME                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)
kubernetes          ClusterIP            10.100.0.1       <none>            443/TCP
my-project-deployment LoadBalancer        10.100.67.24     a40c802597f1448999986e330c1e3714-1187773118.ap-south-1.elb.amazonaws.com 8080:32211/TCP
my-service          LoadBalancer        10.100.105.146   a19c5d1b1ad7343f58419b884309def6-2055312661.ap-south-1.elb.amazonaws.com 8080:32279/TCP
```

Copy ssh public keys of Jenkins into Kubernetes and Kubernetes into Jenkins

```
[root@kubernetes .ssh]# cat authorized_keys
no-port-forwarding,no-agent-forwarding,no-X11-forwarding,command="echo 'Please login as the user \"ec2-user\" rather than the user \"root\".';echo;sleep 10;exit 142" ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQChZsQ170sWUQebP3KYnH/RH/yLdysQbHRIk1ZH6DaYGZa7DtF/zD4Y8okiO+NbegBYKnWSvmyA7LSK29hjtZHgIGStgybAHVlu8BnIGziJeLJHzGSeMYwIptzTHIFzLtmXjodEFH7JLpe8vA8Hh20fhEK4Rwi4A1dwCggpb+QaE3XbXpZ+ugDFzKNNpcy44jMUBeC1D0b0A1dyC8+pdQrxFhtVgWRFPxTShJDWVGLJrVPMRYxJLnZTqU+vvtdIm/M6CCp3KCLe0AEtj3710qwTqn1PSy1N1SxAeCb3LeLb156fHLe+2Nn8Um6MQQXVsg1T+RAMOG87asZ0y8/6HzAXVbz project
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQChZsQ170sWUQebP3KYnH/RH/yLdysQbHRIk1ZH6DaYGZa7DtF/zD4Y8okiO+NbegBYKnWSvmyA7LSK29hjtZHgIGStgybAHVlu8BnIGziJeLJHzGSeMYwIptzTHIFzLtmXjodEFH7JLpe8vA8Hh20fhEK4Rwi4A1dwCggpb+QaE3XbXpZ+ugDFzKNNpcy44jMUBeC1D0b0A1dyC8+pdQrxFhtVgWRFPxTShJDWVGLJrVPMRYxJLnZTqU+vvtdIm/M6CCp3KCLe0AEtj3710qwTqn1PSy1N1SxAeCb3LeLb156fHLe+2Nn8Um6MQQXVsg1T+RAMOG87asZ0y8/6HzAXVbz project
dUXOfT6h0pAFwxxqM+JtSD5RiNaANqx5owPgiQILtnORz+OqgFWScFffJ8S/JxJeRMQF0zU8GeQTK/d5CeYzLjcaT5E3Hy4GMzrh9fmgxCF0YCEXdo+tTcFeFHLsm4zKZcfotsniPpocVvzbz9kPjEJShisvAeJZik4RImS8L6fVwMf6nJOCU62FQ/XzojhSrJkafZnnex8R5nB3y3CoRM5CHXIawm8WfCmtZ5o4JwbEh2+ubXLj0L0n+nDgbr7evKz8r4qINBY1yE1gAJvr7v9DLCCq/qNLX2Z6h1oKNxJvJka4FkYN7V3k/S3VwLuT0KgcylM6Xsp64ERgwx40STWjTtENpw5W+jgvJ0qk+XhdPYIjNMW6B+ILrh09qspLrD7GFAxSiHBPhJ939E= root@jenkins.example.com
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQChZsQ170sWUQebP3KYnH/RH/yLdysQbHRIk1ZH6DaYGZa7DtF/zD4Y8okiO+NbegBYKnWSvmyA7LSK29hjtZHgIGStgybAHVlu8BnIGziJeLJHzGSeMYwIptzTHIFzLtmXjodEFH7JLpe8vA8Hh20fhEK4Rwi4A1dwCggpb+QaE3XbXpZ+ugDFzKNNpcy44jMUBeC1D0b0A1dyC8+pdQrxFhtVgWRFPxTShJDWVGLJrVPMRYxJLnZTqU+vvtdIm/M6CCp3KCLe0AEtj3710qwTqn1PSy1N1SxAeCb3LeLb156fHLe+2Nn8Um6MQQXVsg1T+RAMOG87asZ0y8/6HzAXVbz project
dp/qiQGVNGT/5f28H1Q814G0FaJiYsoPspSPGhIesPIEu+8nNBbYEjZDLFJMy7fUcK618Mha1hsAdIc4YKMFUUt05Dyl5mIRpShqInAIJ9kZLmITproqYQ5zXj7amyAoRVqMV9OUR2He8ypsds4s2i8er/PLKf9vk0ghjMjQtj9J305X3W0Aus.EtLauWQZLcF88rBIXkD5FMZhbQ3EA0y+v4nVmyNIU4/sBhKs7KLHRN944F0ignGc8EWaiOwhHet5S8Ns638R8XPUFrcLAXR/QwMNEInMTXCRbFtd8h0k4AddF9eUdzRodd7PMVGXIBHMqWHSdV9S1XC29NlclVwMQ88F0083UTCnxCB4DTRyxCxH1HvGE07sGIdYfxqR8ZzDwMHPkghf7hteY8= root@ip-172-31-40-81.ap-south-1.compute.amazonaws.com
```

```
[root@jenkins .ssh]# cat authorized_keys
no-port-forwarding,no-agent-forwarding,no-X11-forwarding,command="echo 'Please login as the user \"ec2-user\" rather than the user \"root\".';echo;sleep 10;exit 142" ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQChZsQ170sWUQebP3KYnH/RH/yLdysQbHRIk1ZH6DaYGZa7DtF/zD4Y8okiO+NbegBYKnWSvmyA7LSK29hjtZHgIGStgybAHVlu8BnIGziJeLJHzGSeMYwIptzTHIFzLtmXjodEFH7JLpe8vA8Hh20fhEK4Rwi4A1dwCggpb+QaE3XbXpZ+ugDFzKNNpcy44jMUBeC1D0b0A1dyC8+pdQrxFhtVgWRFPxTShJDWVGLJrVPMRYxJLnZTqU+vvtdIm/M6CCp3KCLe0AEtj3710qwTqn1PSy1N1SxAeCb3LeLb156fHLe+2Nn8Um6MQQXVsg1T+RAMOG87asZ0y8/6HzAXVbz project
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQChZsQ170sWUQebP3KYnH/RH/yLdysQbHRIk1ZH6DaYGZa7DtF/zD4Y8okiO+NbegBYKnWSvmyA7LSK29hjtZHgIGStgybAHVlu8BnIGziJeLJHzGSeMYwIptzTHIFzLtmXjodEFH7JLpe8vA8Hh20fhEK4Rwi4A1dwCggpb+QaE3XbXpZ+ugDFzKNNpcy44jMUBeC1D0b0A1dyC8+pdQrxFhtVgWRFPxTShJDWVGLJrVPMRYxJLnZTqU+vvtdIm/M6CCp3KCLe0AEtj3710qwTqn1PSy1N1SxAeCb3LeLb156fHLe+2Nn8Um6MQQXVsg1T+RAMOG87asZ0y8/6HzAXVbz project
dUXOfT6h0pAFwxxqM+JtSD5RiNaANqx5owPgiQILtnORz+OqgFWScFffJ8S/JxJeRMQF0zU8GeQTK/d5CeYzLjcaT5E3Hy4GMzrh9fmgxCF0YCEXdo+tTcFeFHLsm4zKZcfotsniPpocVvzbz9kPjEJShisvAeJZik4RImS8L6fVwMf6nJOCU62FQ/XzojhSrJkafZnnex8R5nB3y3CoRM5CHXIawm8WfCmtZ5o4JwbEh2+ubXLj0L0n+nDgbr7evKz8r4qINBY1yE1gAJvr7v9DLCCq/qNLX2Z6h1oKNxJvJka4FkYN7V3k/S3VwLuT0KgcylM6Xsp64ERgwx40STWjTtENpw5W+jgvJ0qk+XhdPYIjNMW6B+ILrh09qspLrD7GFAxSiHBPhJ939E= root@jenkins.example.com
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQChZsQ170sWUQebP3KYnH/RH/yLdysQbHRIk1ZH6DaYGZa7DtF/zD4Y8okiO+NbegBYKnWSvmyA7LSK29hjtZHgIGStgybAHVlu8BnIGziJeLJHzGSeMYwIptzTHIFzLtmXjodEFH7JLpe8vA8Hh20fhEK4Rwi4A1dwCggpb+QaE3XbXpZ+ugDFzKNNpcy44jMUBeC1D0b0A1dyC8+pdQrxFhtVgWRFPxTShJDWVGLJrVPMRYxJLnZTqU+vvtdIm/M6CCp3KCLe0AEtj3710qwTqn1PSy1N1SxAeCb3LeLb156fHLe+2Nn8Um6MQQXVsg1T+RAMOG87asZ0y8/6HzAXVbz project
dp/qiQGVNGT/5f28H1Q814G0FaJiYsoPspSPGhIesPIEu+8nNBbYEjZDLFJMy7fUcK618Mha1hsAdIc4YKMFUUt05Dyl5mIRpShqInAIJ9kZLmITproqYQ5zXj7amyAoRVqMV9OUR2He8ypsds4s2i8er/PLKf9vk0ghjMjQtj9J305X3W0Aus.EtLauWQZLcF88rBIXkD5FMZhbQ3EA0y+v4nVmyNIU4/sBhKs7KLHRN944F0ignGc8EWaiOwhHet5S8Ns638R8XPUFrcLAXR/QwMNEInMTXCRbFtd8h0k4AddF9eUdzRodd7PMVGXIBHMqWHSdV9S1XC29NlclVwMQ88F0083UTCnxCB4DTRyxCxH1HvGE07sGIdYfxqR8ZzDwMHPkghf7hteY8= root@docker.example.com

ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQChZsQ170sWUQebP3KYnH/RH/yLdysQbHRIk1ZH6DaYGZa7DtF/zD4Y8okiO+NbegBYKnWSvmyA7LSK29hjtZHgIGStgybAHVlu8BnIGziJeLJHzGSeMYwIptzTHIFzLtmXjodEFH7JLpe8vA8Hh20fhEK4Rwi4A1dwCggpb+QaE3XbXpZ+ugDFzKNNpcy44jMUBeC1D0b0A1dyC8+pdQrxFhtVgWRFPxTShJDWVGLJrVPMRYxJLnZTqU+vvtdIm/M6CCp3KCLe0AEtj3710qwTqn1PSy1N1SxAeCb3LeLb156fHLe+2Nn8Um6MQQXVsg1T+RAMOG87asZ0y8/6HzAXVbz project
ouPzfpRcx2LauRDvLz66FLGvx82WpU67jxawiEF25tZ+HpxNzqdGUGoDNwTAuCLFeytP4FZNCZ0pCcwzLWnhLFTtKmAFVU/s4Wk55026zqYnc8+D6p809AJeaof4btmwmacc57pQMGFFcOmFe4+b1CZDn+TyiVYDRPR8D6ebqgDXLoUn8xb990xrDFwMSaleZtPgYoehJ2fmx50DKYgt76W9GhdBVI2jBqdhEOLRnw05C9tP2vFureQs9LYrTE= root@docker.example.com
```

Add Kubernetes server into Jenkins

Name ?

Kubernetes

Hostname ?

172.31.44.151

Username ?

root

Remote Directory ?

/root

☐ Avoid sending files that have not changed ?

## Add build artifacts

General

Source Code Management

Build Triggers

Build Environment

Pre Steps

Build

Post Steps

Build Settings

Post-build Actions

Transfer Set

Source files ?

Remove prefix ?

Remote directory ?

Exec command ?  

```
kubectl delete deployment gm-deployment
kubectl apply -f deployment.yml
kubectl apply -f service.yml
```

## Now build the job

Dashboard > projectbuildtomcat > #12 > Console Output

Status

</> Changes

Console Output

Edit Build Information

Delete build '#12'

Timings

Git Build Data

Redeploy Artifacts

Test Result

See Fingerprints

Console Output

Download

Copy

View as plain text

Started by user Glenn Muga

Running as SYSTEM

Building in workspace /var/lib/jenkins/workspace/projectbuildtomcat

The recommended git tool is: NONE

No credentials specified

> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/projectbuildtomcat/.git # timeout=10

Fetching changes from the remote Git repository

> git config remote.origin.url https://github.com/glennmuga/maven.git # timeout=10

Fetching upstream changes from https://github.com/glennmuga/maven.git

> git --version # timeout=10

> git --version # 'git version 2.40.1'

> git fetch --tags --force --progress -- https://github.com/glennmuga/maven.git +refs/heads/\*:refs/remotes/origin/\* # timeout=10

> git rev-parse refs/remotes/origin/main^{commit} # timeout=10

Checking out Revision 717e79c68b7925f8d5d4c05cc5be52c3dc7033a8 (refs/remotes/origin/main)

> git config core.sparsecheckout # timeout=10

## Expose application using external Ip address

## It is successfully deployed and running

Not secure aa65762f9a679492fb3edaa36214dde1-323019057.ap-southeast-1.elb.amazonaws.com:8080/webapp/

LTIMindtree Favorites Folder http://18.139.110.21...

## New user Register for DevOps Learning at Glenn Muga

Please fill in this form to create an account.

Enter Name

Enter Full Name

Enter mobile

Enter mobile number

Enter Email

Enter Email

Password

Enter Password

Repeat Password

Repeat Password

By creating an account you agree to our [Terms & Privacy](#).

Register

Already have an account? [Sign in](#).

## Thank You, Happy Learning

## See You Again



In this way we have automated the whole process. If there are any modifications in the jsp file from github jenkins will automatically build the project and the changes will be reflected on the live webpage automatically.

If there are any errors in the modification the build will be failed and the webpage will not be updated. It will show the last successful built which will help in preventing our webpage from crashing.

By- Glenn Muga.