Project - Finance

Submitted by - **Maulik DEVANI**
Date of submission -12-07-2024
Submitted to - Mr.Vikul

- **Problem Statement:**

❖ **FinanceMe** is a Global leading Banking and Financial services provider based out of Germany. The company offers products and services like Banking, Funds Management, Loans, Debit Cards and Credits Cards, Investment Banking etc. Initially the company was using a **Monolithic application** architecture, As the company grown, It started facing difficulties in managing the application infrastructure and application deployments and Scaling of application when the traffic load increases.

❖ **FinanceMe** has decided to opt for **microservice** architecture for its applications and decided to go **DevOps** by implementing necessary automation using **CICD**. FinanceMe has decided to use AWS as primary cloud services provider to create servers, databases and application deployments.

- **Building Complex Monolithic Application is difficult.**
- **Manual efforts to test various components/modules of the project**
- **Incremental builds are difficult to manage, test and deploy.**
- **It was not possible to scale up individual modules independently.**
- **Creation of infrastructure and configure it manually is very time consuming.**
- **Continuous manual monitoring the application is quite challenging.**

- **Requirement :**

➢ As soon as the developer pushes the updated code on the GIT master branch, the code should be checked out, compiled, tested, packaged and containerized.
➢ A new test-server should be provisioned using terraform and should be automatically configured using Ansible with all the required software's
➢ As soon as the server is available, the application must be deployed to the test-server automatically.

- **Infrastructure:**

➢ **Server 1: Master server**

JDK	**Jenkins**	**Ansible**
GIT	**Docker**	
Maven	**Terraform**	

➢ **Server 2: Test server**

➢ **Server 3 : Monitoring**

Prometheus
Grafana

Implementation:

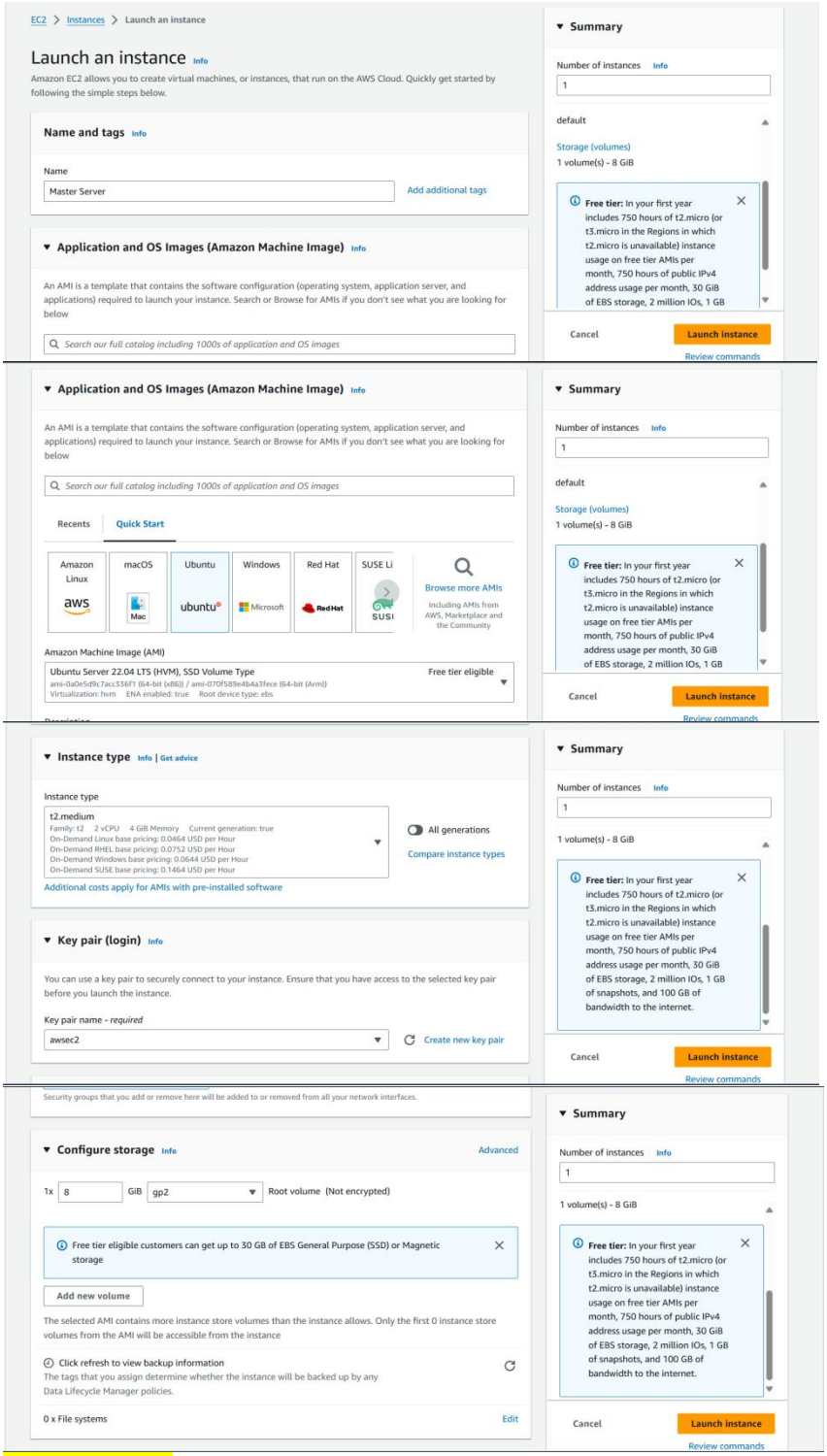
Server 1:

- **Server 1: Master server**

JDK	**Jenkins**	**Ansible**
GIT	**Docker**	
Maven	**Terraform**	

Steps:

Launch ec2-instance for Master(Main) Server.



Launch instance

- **Installation of tool:**

  Java

  Git

```
root@ip-172-31-25-153:~# history
    1  apt update
    2  apt install openjdk-17-jdk
    3  java -version
    4  mvn --version
    5  git --version
    6  apt install docker.io
    7  docker --version
    8  history
root@ip-172-31-25-153:~# java --version
openjdk 17.0.11 2024-04-16
OpenJDK Runtime Environment (build 17.0.11+9-Ubuntu-122.04.1)
OpenJDK 64-Bit Server VM (build 17.0.11+9-Ubuntu-122.04.1, mixed mode, sharing)
root@ip-172-31-25-153:~# git --version
git version 2.34.1
root@ip-172-31-25-153:~#
```

Terraform:

```
root@ip-172-31-25-153:~# cat terraform.sh
#!/bin/bash
sudo apt-get update && sudo apt-get install -y gnupg software-properties-common
wget -O- https://apt.releases.hashicorp.com/gpg | \
gpg --dearmor | \
sudo tee /usr/share/keyrings/hashicorp-archive-keyring.gpg > /dev/null
echo "deb [signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] \
https://apt.releases.hashicorp.com $(lsb_release -cs) main" | \
sudo tee /etc/apt/sources.list.d/hashicorp.list
sudo apt update -y
sudo apt-get install terraform -y
root@ip-172-31-25-153:~# terraform --version
Terraform v1.9.2
on linux_amd64
```

Ansible:

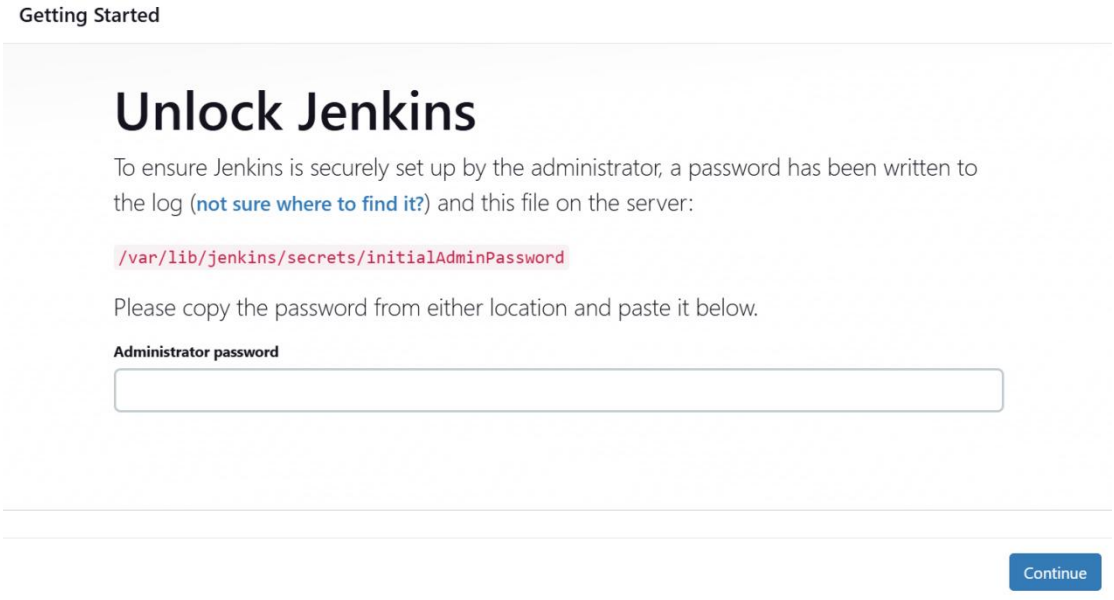
```
root@ip-172-31-25-153:~# cat ansible.sh
#!/bin/bash
sudo apt update
sudo apt install software-properties-common
sudo add-apt-repository --yes --update ppa:ansible/ansible
sudo apt install ansible -y
root@ip-172-31-25-153:~# ansible --version
ansible [core 2.16.8]
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /root/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/bin/ansible
  python version = 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0] (/usr/bin/python3)
  jinja version = 3.0.3
  libyaml = True
```

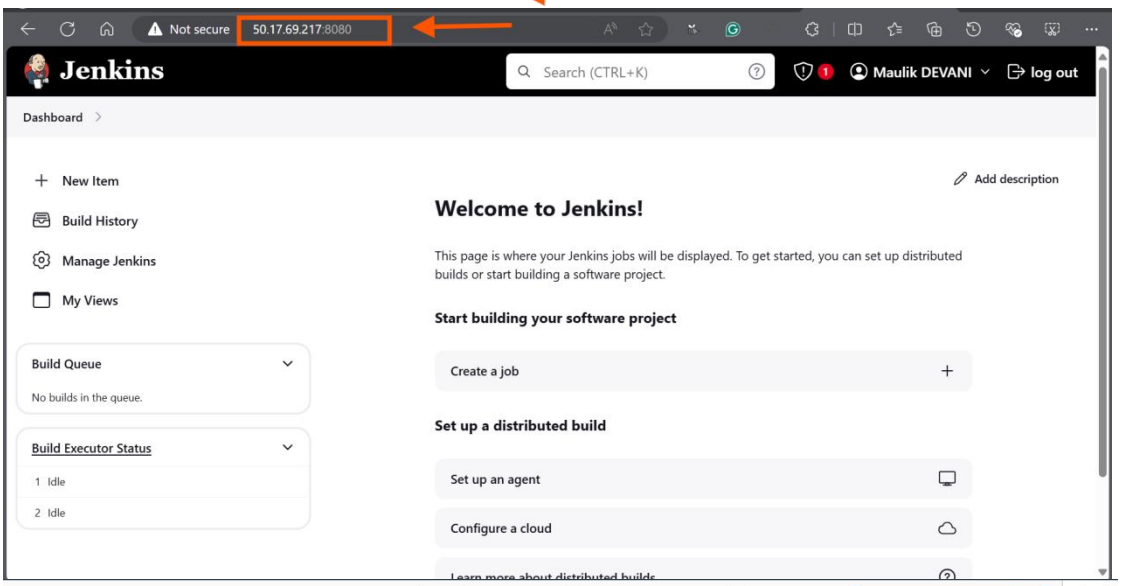
Jenkins:

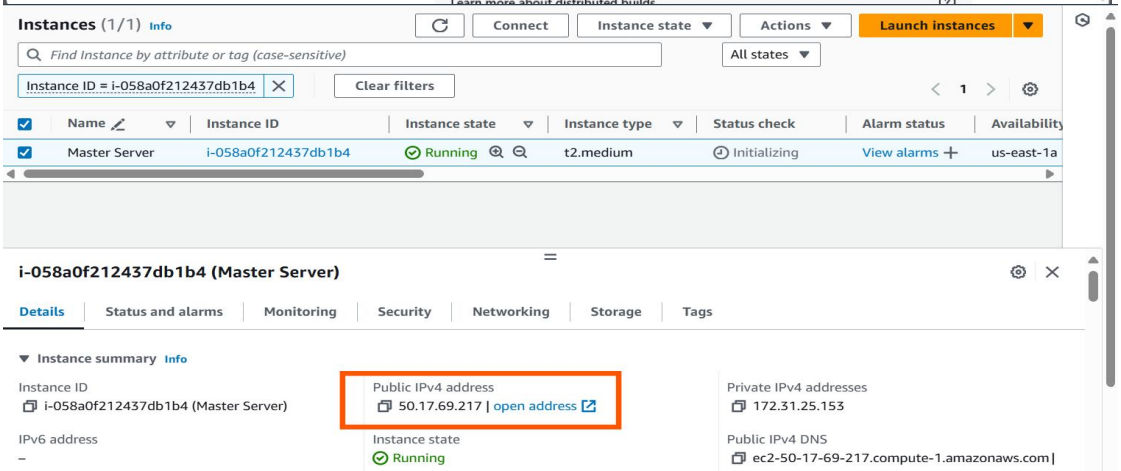
```
root@ip-172-31-25-153:~# cat jenkins.sh
#!/bin/bash
sudo wget -O /usr/share/keyrings/jenkins-keyring.asc \
  https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
echo "deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc]" \
  https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
sudo apt-get update
sudo apt-get install jenkins -y
root@ip-172-31-25-153:~# jenkins --version
2.452.3
```

- **Configured Jenkins:**

Provide initial password







- **Adding Jenkins root privilege:**
  - ✓ **USE: To prevent error as Jenkins user to run sudo task**

```
  GNU nano 6.2                                    /etc/sudoers.tmp

# Per-user preferences; root won't have sensible values for them.
#Defaults:%sudo env_keep += "EMAIL DEBEMAIL DEBFULLNAME"

# "sudo scp" or "sudo rsync" should be able to use your SSH agent.
#Defaults:%sudo env_keep += "SSH_AGENT_PID SSH_AUTH_SOCK"

# Ditto for GPG agent
#Defaults:%sudo env_keep += "GPG_AGENT_INFO"

# Host alias specification

# User alias specification

# Cmnd alias specification

# User privilege specification
root    ALL=(ALL:ALL) ALL
jenkins ALL=(ALL) NOPASSWD:ALL

# Members of the admin group may gain root privileges
%admin ALL=(ALL) ALL

# Allow members of group sudo to execute any command
%sudo   ALL=(ALL:ALL) ALL

# See sudoers(5) for more information on "@include" directives:

@includedir /etc/sudoers.d

^G Help      ^O Write Out  ^W Where Is   ^K Cut       ^T Execute   ^C Location  M-U Undo    M-A Set Mark  M-] To Bracket
^X Exit      ^R Read File  ^\ Replace    ^U Paste     ^J Justify   ^/ Go To Line M-E Redo    M-6 Copy      ^Q Where Was
```

- **Adding Jenkins to docker group:**
  - ✓ **USE: Controls docker from Jenkins**

```
docker:x:122:
jenkins:x:123:
root@ip-172-31-25-153:~# usermod -aG docker jenkins
root@ip-172-31-25-153:~# cat /etc/group
```

After:

```
docker:x:122:jenkins
jenkins:x:123:
root@ip-172-31-25-153:~#
```

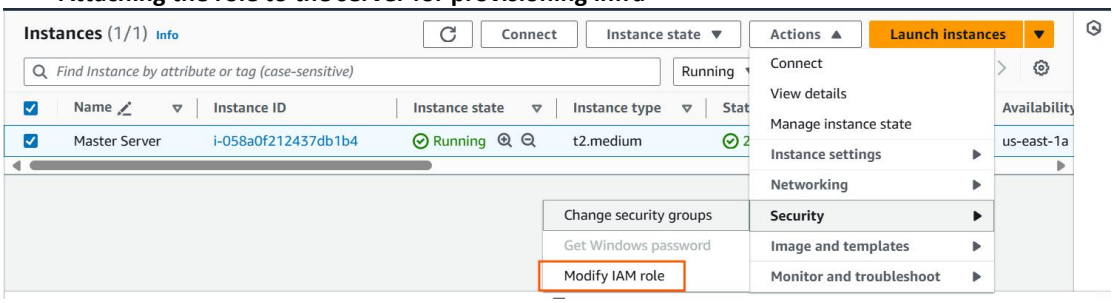
- Installing maven:

```
root@ip-172-31-25-153:~# apt install maven
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libaopalliance-java libapache-pom-java libatinject-jsr330-api-java libcdi-api-java libcommons-cli-java libcommons-io-java libcommons-lang3-java
  libcommons-parent-java libgeronimo-annotation-1.3-spec-java libgeronimo-interceptor-3.0-spec-java libguava-java libguice-java libhawtjni-runtime-java
  libjansi-java libjansi-native-java libjsr305-java libmaven-parent-java libmaven-resolver-java libmaven-shared-utils-java libmaven3-core-java
  libplexus-cipher-java libplexus-classworlds-java libplexus-component-annotations-java libplexus-interpolation-java libplexus-sec-dispatcher-java
  libplexus-utils2-java libsisu-inject-java libsisu-plexus-java libslf4j-java libwagon-file-java libwagon-http-shaded-java libwagon-provider-api-java
Suggested packages:
  libaopalliance-java-doc libatinject-jsr330-api-java-doc libel-api-java libcommons-io-java-doc libcommons-lang3-java-doc libasm-java libcglib-java
  libjsr305-java-doc libmaven-shared-utils-java-doc liblogback-java libplexus-classworlds-java-doc libplexus-sec-dispatcher-java-doc
  libplexus-utils2-java-doc junit4 testng libcommons-logging-java liblog4j1.2-java
The following NEW packages will be installed:
  libaopalliance-java libapache-pom-java libatinject-jsr330-api-java libcdi-api-java libcommons-cli-java libcommons-io-java libcommons-lang3-java
  libcommons-parent-java libgeronimo-annotation-1.3-spec-java libgeronimo-interceptor-3.0-spec-java libguava-java libguice-java libhawtjni-runtime-java
  libjansi-java libjansi-native-java libjsr305-java libmaven-parent-java libmaven-resolver-java libmaven-shared-utils-java libmaven3-core-java
  libplexus-cipher-java libplexus-classworlds-java libplexus-component-annotations-java libplexus-interpolation-java libplexus-sec-dispatcher-java
  libplexus-utils2-java libsisu-inject-java libsisu-plexus-java libslf4j-java libwagon-file-java libwagon-http-shaded-java libwagon-provider-api-java
  maven
0 upgraded, 33 newly installed, 0 to remove and 11 not upgraded.
Need to get 10.2 MB of archives.
After this operation, 13.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

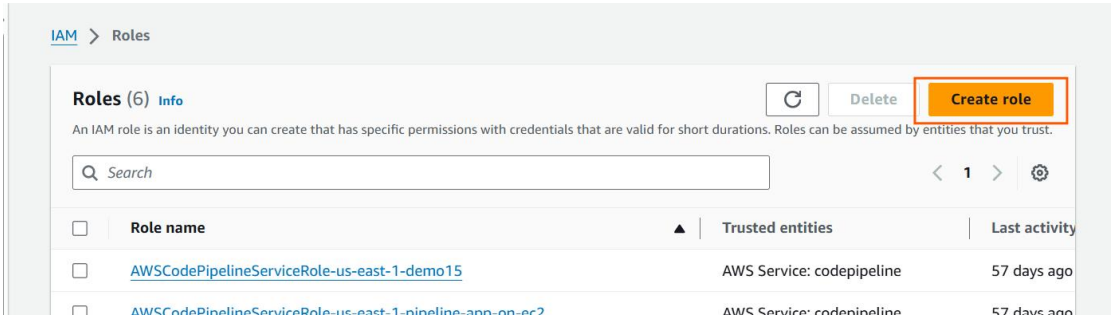
```
root@ip-172-31-25-153:~# mvn -version
Apache Maven 3.6.3
Maven home: /usr/share/maven
Java version: 17.0.11, vendor: Ubuntu, runtime: /usr/lib/jvm/java-17-openjdk-amd64
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "6.5.0-1022-aws", arch: "amd64", family: "unix"
root@ip-172-31-25-153:~#
```

Terraform configuration:

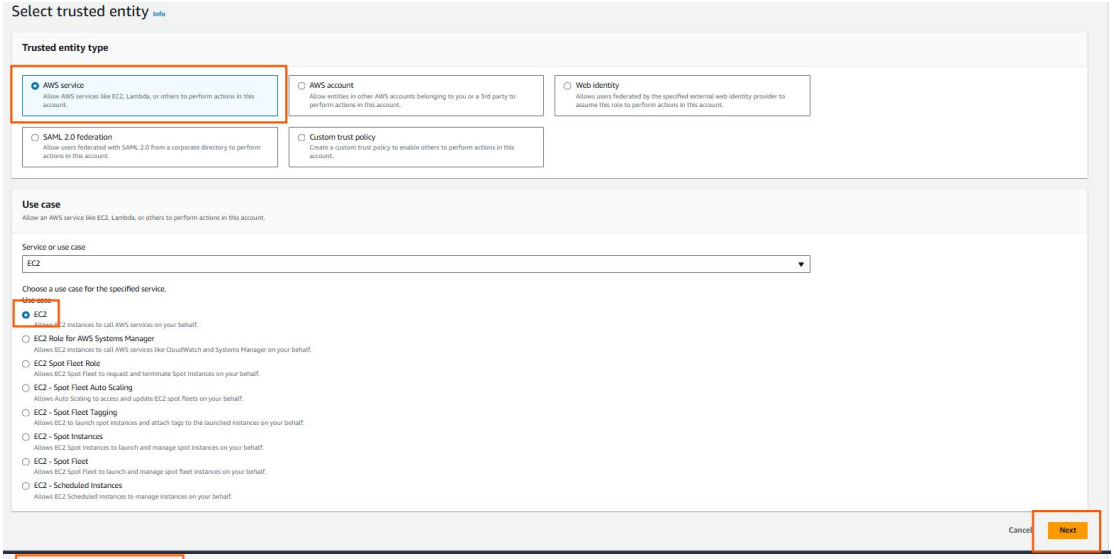
✓ **Attaching the role to the server for provisioning infra**

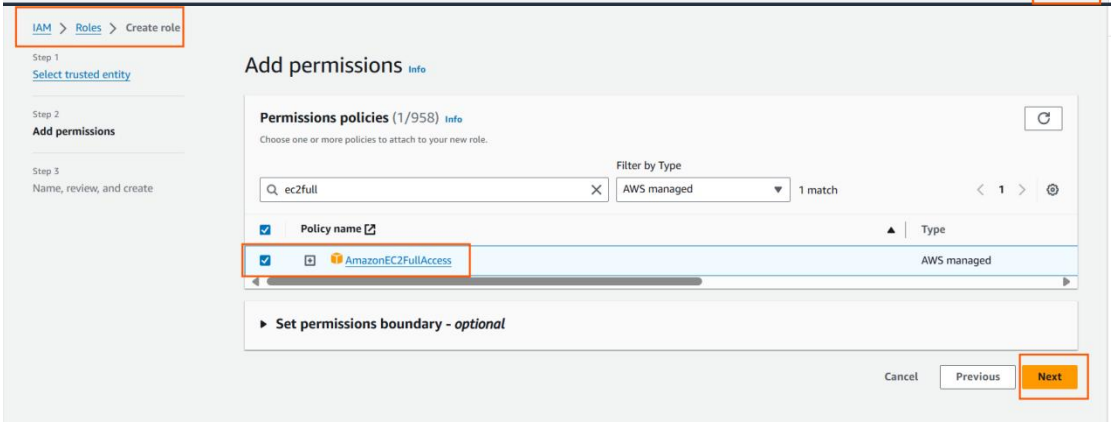


Create new role

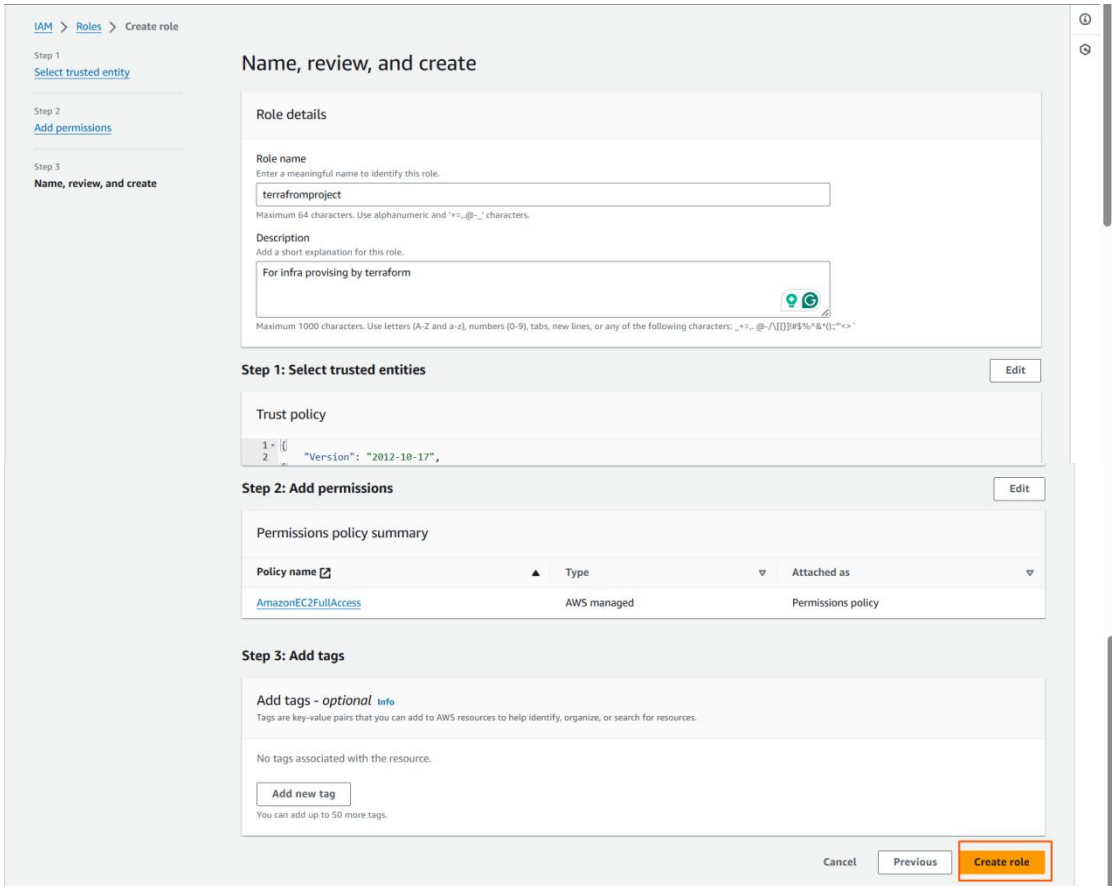


Select ec2:



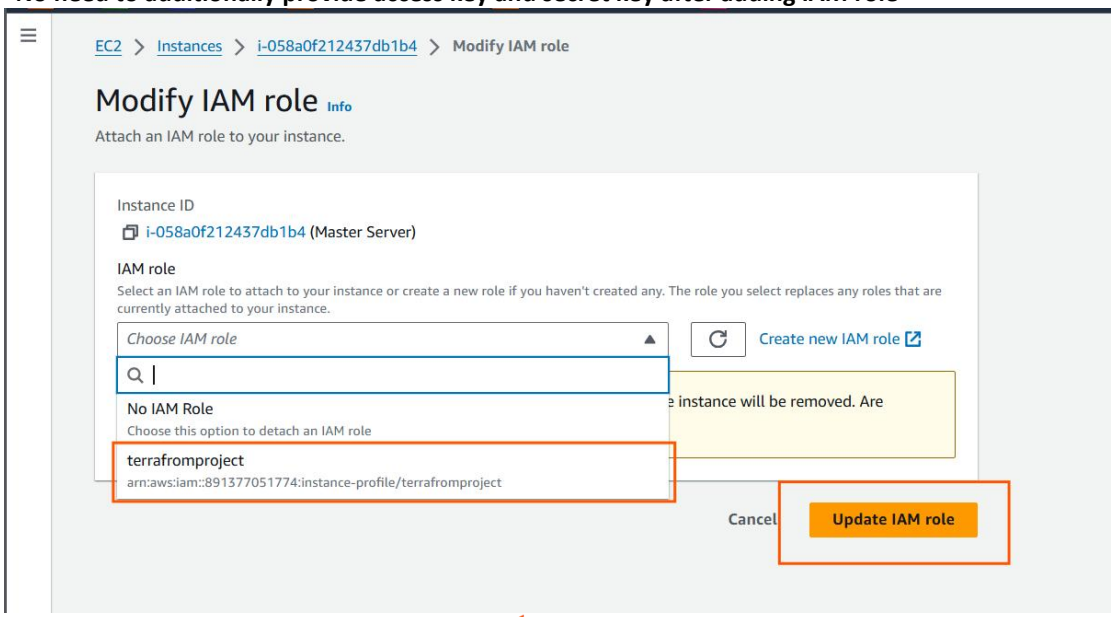


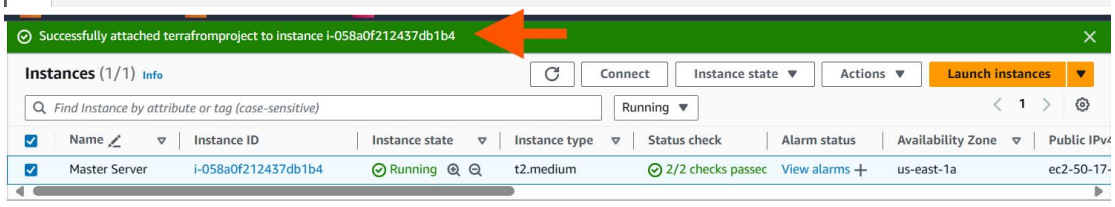
Provide name:



Add role to the server:

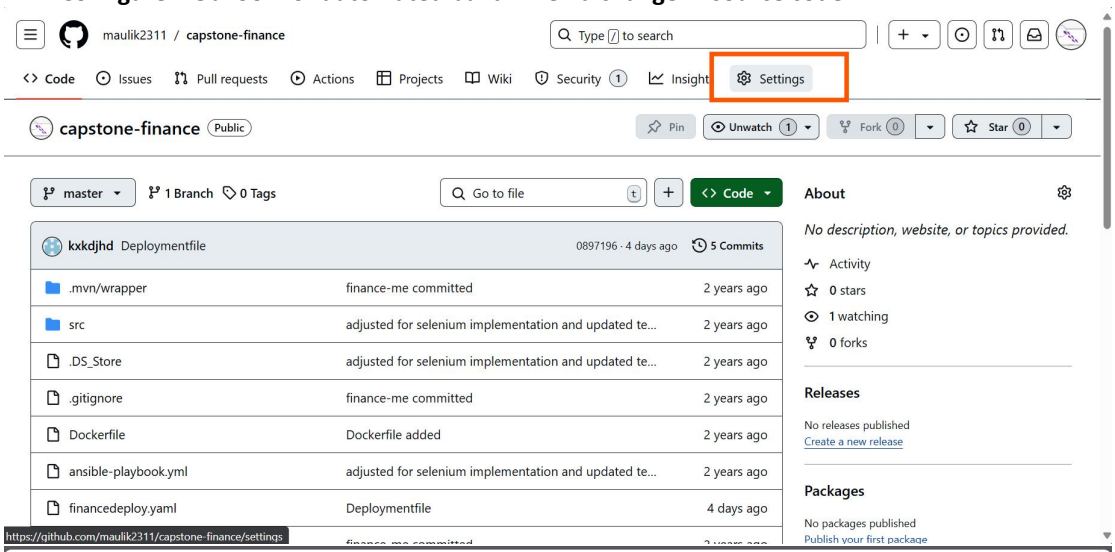
“No need to additionally provide access key and secret key after adding IAM role”

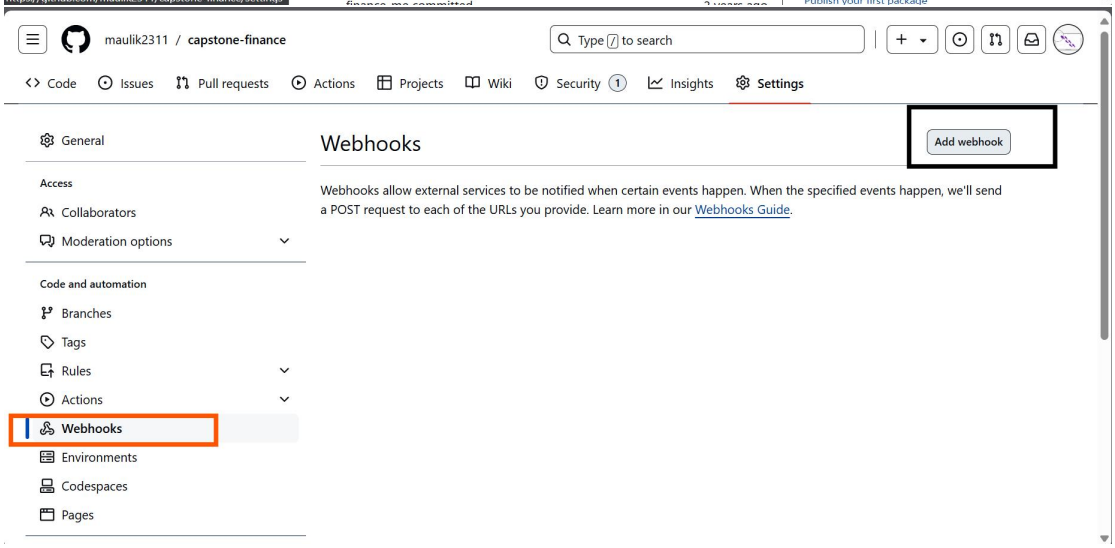




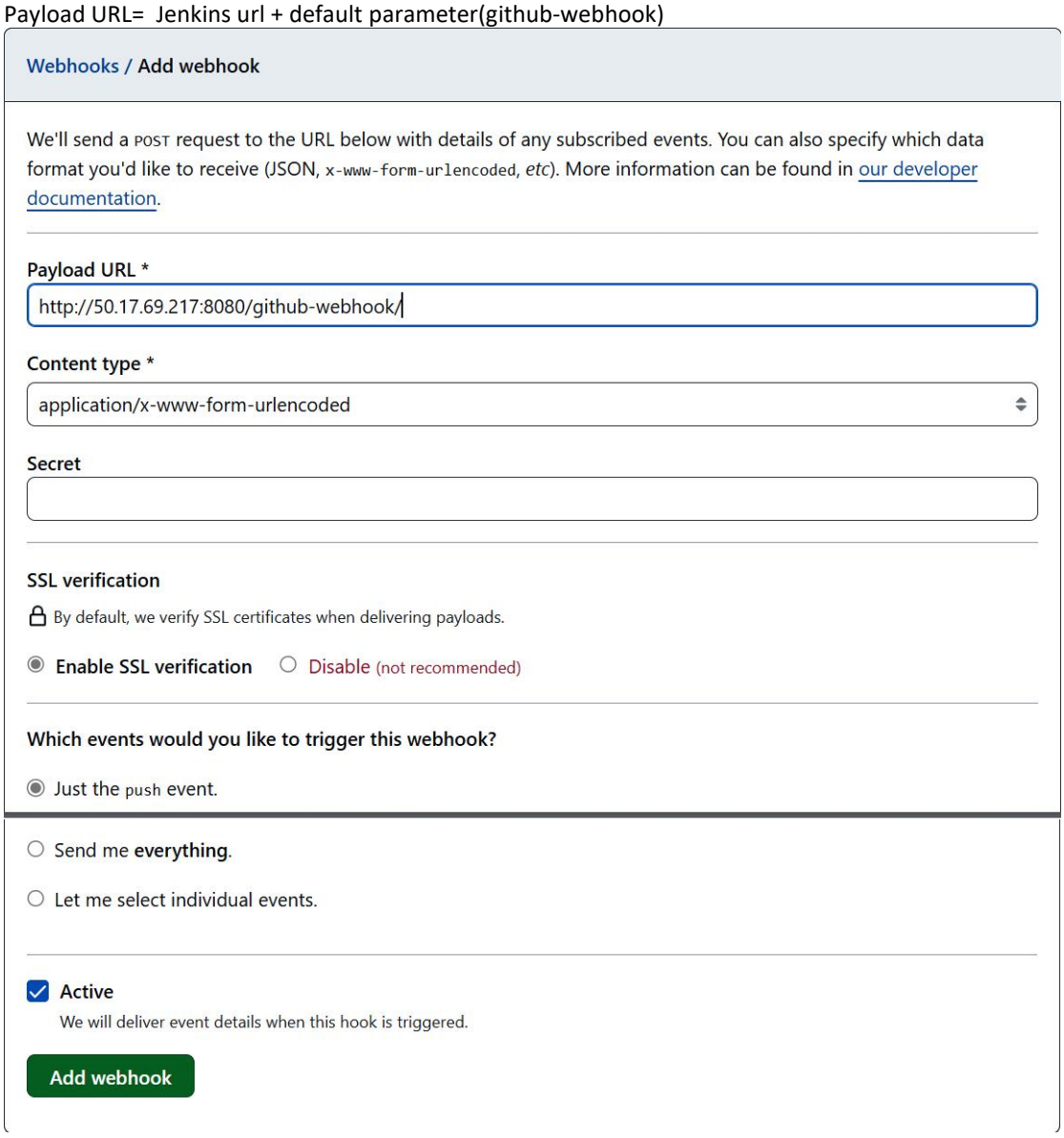
Jenkins:

✓ **Configure webhook for automated build when a change in source code**

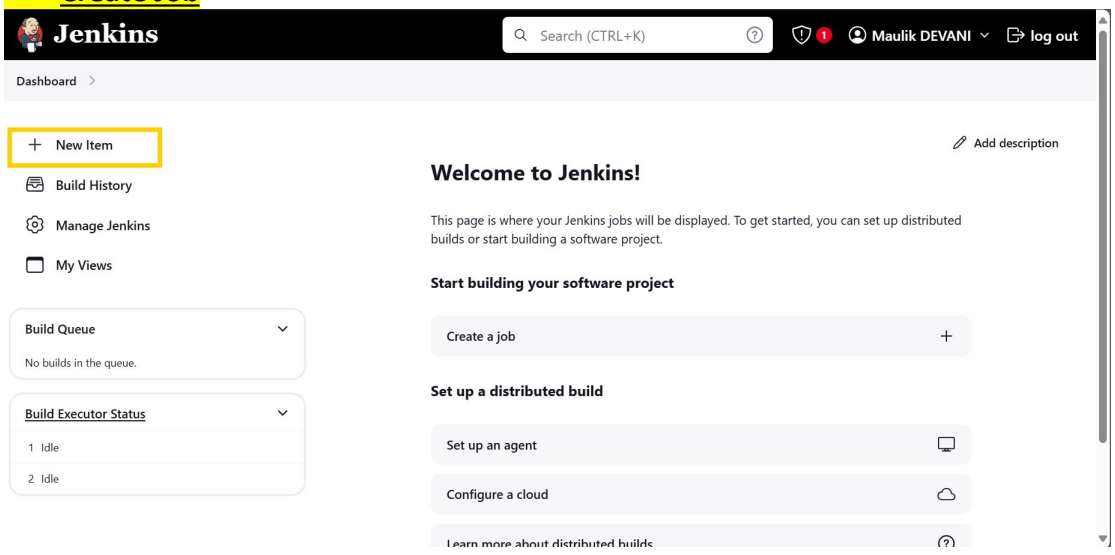




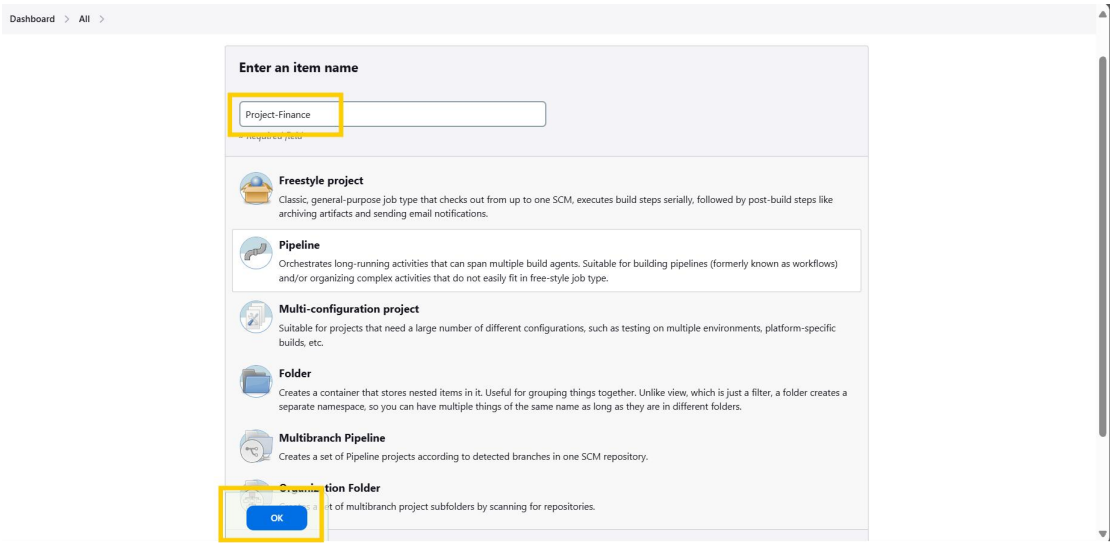
Payload URL= Jenkins url + default parameter(github-webhook)



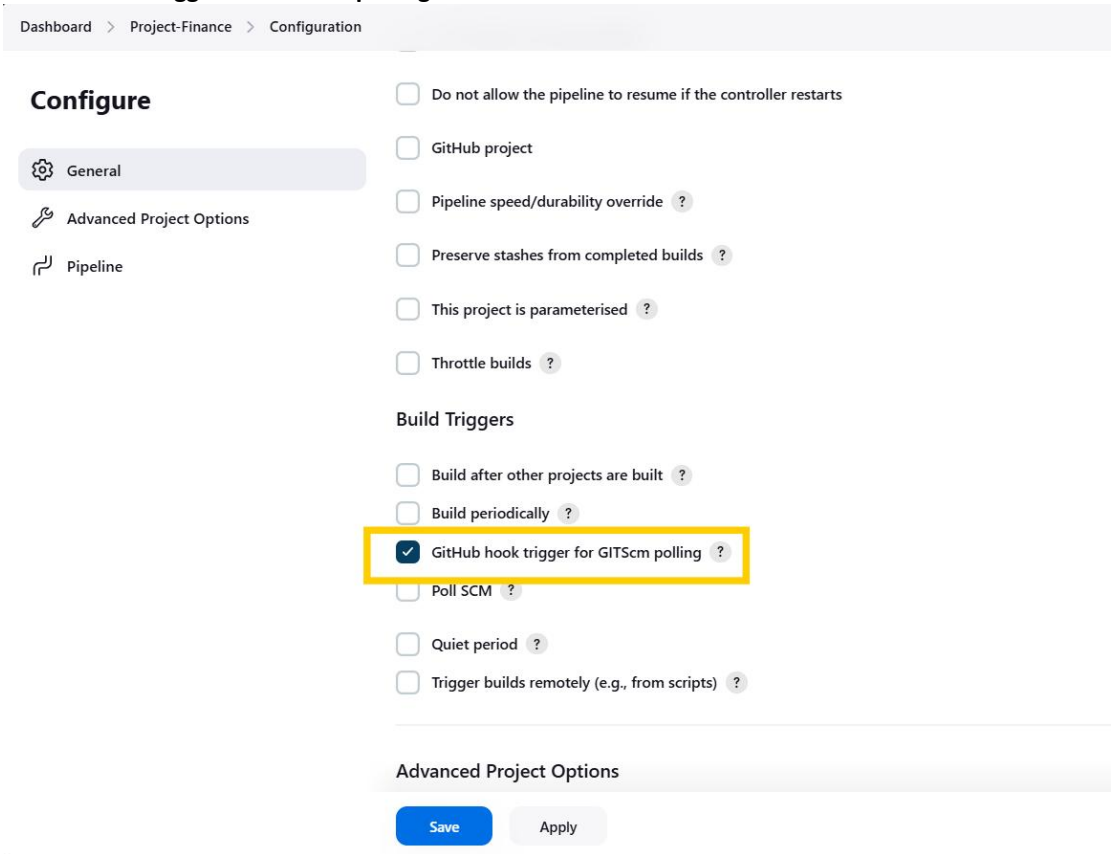
- **Create Job**



Provide Job name.



GitHub hook trigger for GITScm polling:



Declarative pipeline:
SCM_Checkout = Pull the source code

Definition

Pipeline script

Script ?

Hello World

```
pipeline {
    agent any

    stages {
        stage('SCM_Checkout') {
            steps {
                git 'https://github.com/maulik2311/capstone-finance.git'
            }
        }
    }
}
```

Use Groovy Sandbox ?

Pipeline Syntax

Save Apply

Stage2
Build = Source code build ==> Building the artifacts

```
pipeline {
    agent any

    stages {
        stage('SCM_Checkout') {
            steps {
                git 'https://github.com/maulik2311/capstone-finance.git'
            }
        }
        stage('SourcecodeBuild') {
            steps {
                sh 'mvn clean package'
            }
        }
    }
}
```

Stage 1 and 2:
Pull the source code and build the artifact.

```
root@ip-172-31-25-153:/var/lib/jenkins/workspace/Project-Finance# ll
total 72
drwxr-xr-x 6 jenkins jenkins  4096 Jul 12 12:42 ./
drwxr-xr-x 4 jenkins jenkins  4096 Jul 12 12:42 ../
-rw-r--r-- 1 jenkins jenkins  6148 Jul 12 12:40 .DS_Store
drwxr-xr-x 8 jenkins jenkins  4096 Jul 12 12:42 .git/
-rw-r--r-- 1 jenkins jenkins   395 Jul 12 12:40 .gitignore
drwxr-xr-x 3 jenkins jenkins  4096 Jul 12 12:40 .mvn/
-rw-r--r-- 1 jenkins jenkins   105 Jul 12 12:40 Dockerfile
-rw-r--r-- 1 jenkins jenkins   419 Jul 12 12:40 ansible-playbook.yml
-rw-r--r-- 1 jenkins jenkins   572 Jul 12 12:40 financedeploy.yaml
-rwxr-xr-x 1 jenkins jenkins 10284 Jul 12 12:40 mvnw*
-rw-r--r-- 1 jenkins jenkins  6734 Jul 12 12:40 mvnw.cmd
-rw-r--r-- 1 jenkins jenkins  1532 Jul 12 12:40 pom.xml
drwxr-xr-x 4 jenkins jenkins  4096 Jul 12 12:40 src/
drwxr-xr-x 9 jenkins jenkins  4096 Jul 12 12:43 target/
root@ip-172-31-25-153:/var/lib/jenkins/workspace/Project-Finance# ls target/
banking-0.0.1-SNAPSHOT.jar           classes          generated-test-sources  maven-status     test-classes
banking-0.0.1-SNAPSHOT.jar.original  generated-sources  maven-archiver          surefire-reports
root@ip-172-31-25-153:/var/lib/jenkins/workspace/Project-Finance#
```

Stage-3

Docker image build

```
pipeline {
    agent any

    stages {
        stage('SCM_Checkout') {
            steps {
                git 'https://github.com/maulik2311/capstone-finance.git'
            }
        }
        stage('SourcecodeBuild') {
            steps {
                sh 'mvn clean package'
            }
        }
        stage('Dockerimage_build') {
            steps {
                sh 'docker version'
                sh "docker build -t maulikd2397/finance:${BUILD_NUMBER} ."
                sh "docker tag maulikd2397/finance:${BUILD_NUMBER} maulikd2397/finance:latest"
                sh 'docker images'
            }
        }
    }
}
```

```
root@ip-172-31-25-153:/var/lib/jenkins/workspace/Project-Finance# docker images
REPOSITORY              TAG       IMAGE ID       CREATED              SIZE
maulikd2397/finance     6         818ef8f0d0f7   30 seconds ago       696MB
maulikd2397/finance     latest    818ef8f0d0f7   30 seconds ago       696MB
maulikd2397/finance     5         ac4deeb28414   About a minute ago   696MB
openjdk                 11        47a932d998b7   23 months ago        654MB
```

Stage-4

Log in to Dockerhub => Provide credentials of Dockerhub b pipeline syntax

```
        }
    }
    stage('Login2Dockerhub') {
        steps {
            sh 'mvn clean package'
        }
    }
  }
}
```

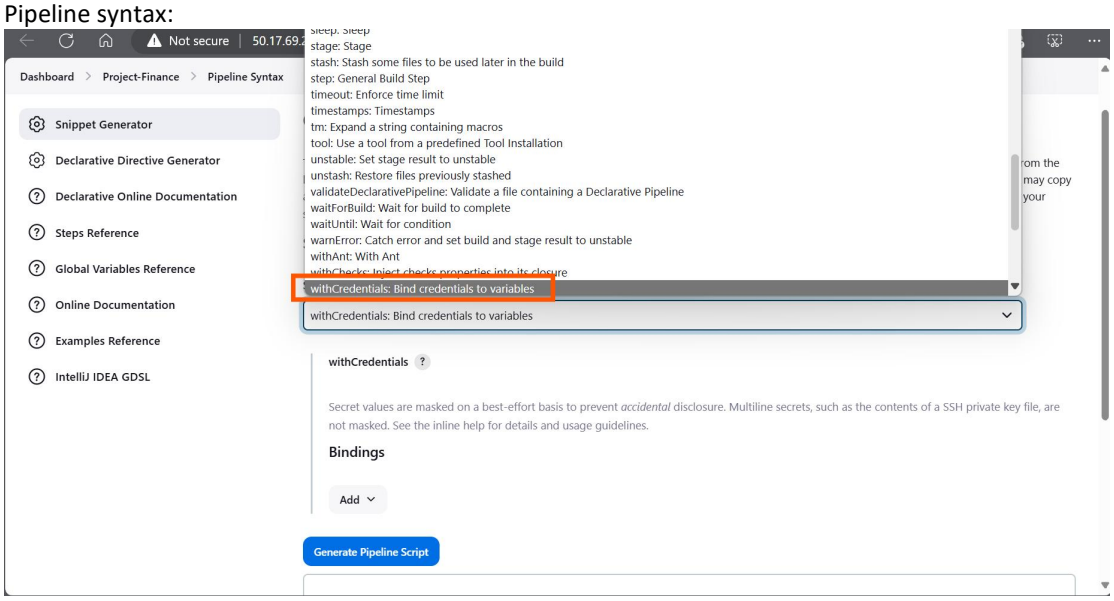
Use Groovy Sandbox ?

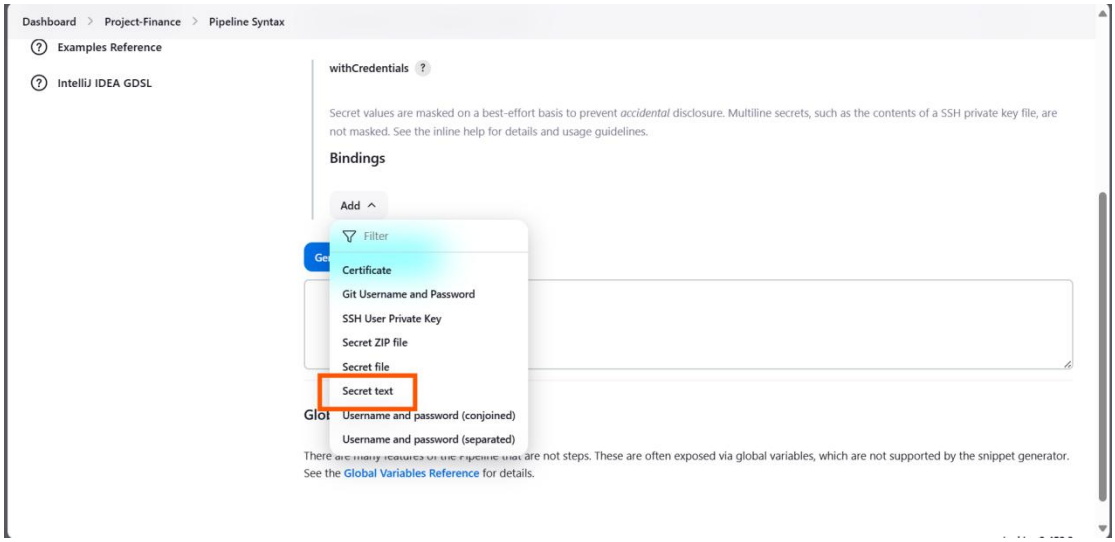
Pipeline Syntax

Save Apply

Select: bind credentials with variable.

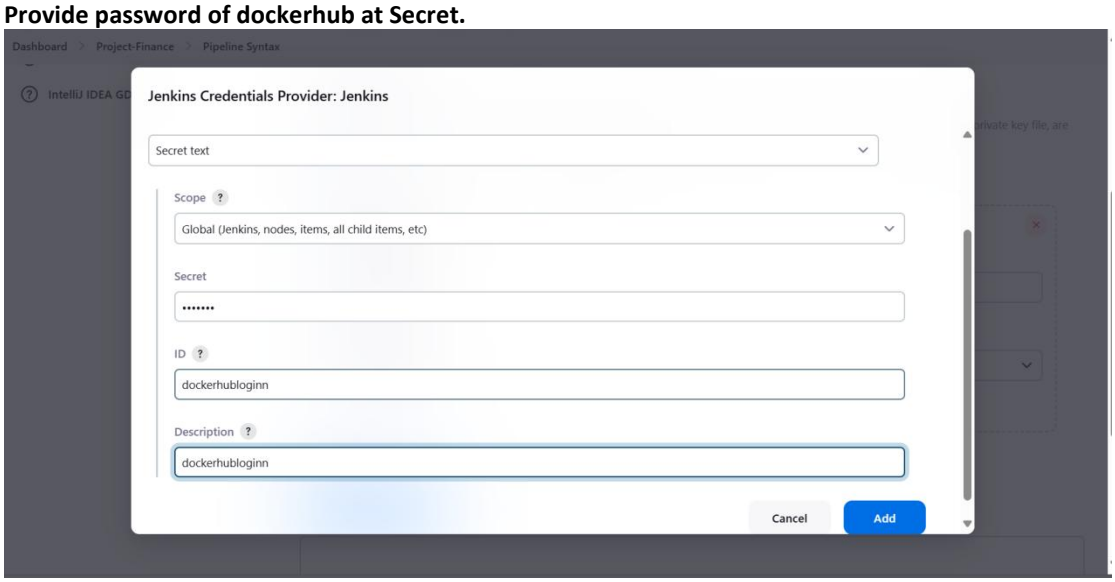
Pipeline syntax:



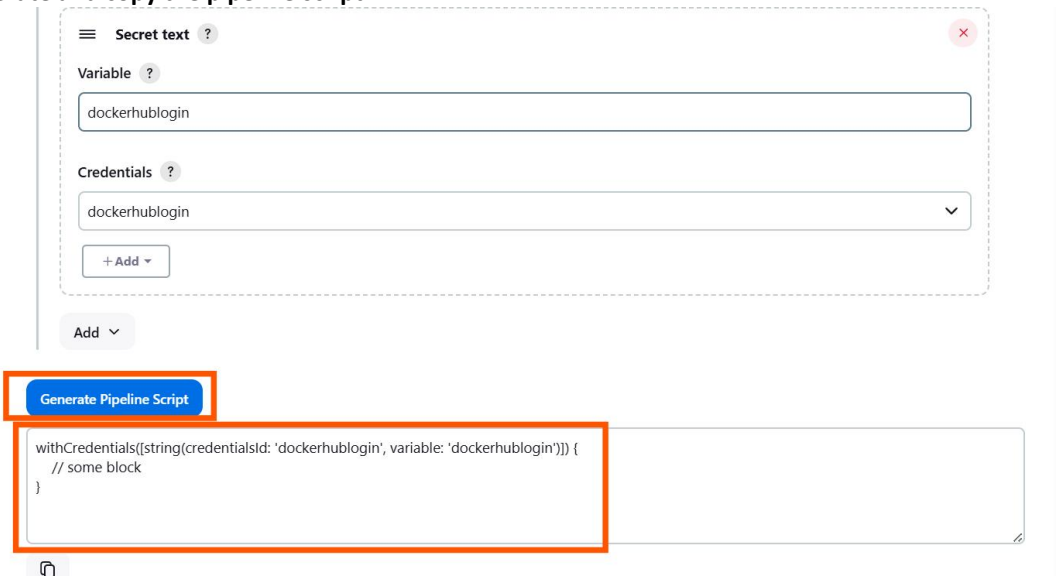


Add credentials:

Provide password of dockerhub at Secret.



Generate and copy the pipeline script



Provide variable as password “-p”

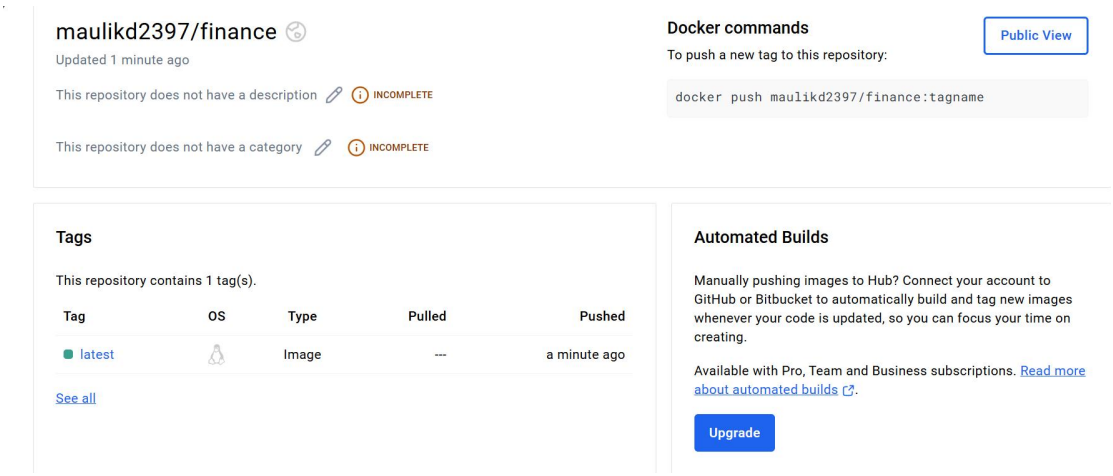
```
pipeline {
    agent any

    stages {
        stage('SCM_Checkout') {
            steps {
                git 'https://github.com/maulik2311/capstone-finance.git'
            }
        }
        stage('SourcecodeBuild') {
            steps {
                sh 'mvn clean package'
            }
        }
        stage('Dockerimage_build') {
            steps {
                sh 'docker version'
                sh "docker build -t maulikd2397/finance:${BUILD_NUMBER} ."
                sh "docker tag maulikd2397/finance:${BUILD_NUMBER} maulikd2397/finance:latest"
                sh 'docker images'
            }
        }
        stage('Login2Dockerhub') {
            steps {
                withCredentials([string(credentialsId: 'dockerhublogin', variable: 'dockerhublogin')]) {
                sh "docker login -u maulikd2397 -p ${dockerhublogin}"
                }
            }
        }
    }
}
```

```
Warning: A secret was passed to "sh" using Groovy String interpolation, which is insecure.
                 Affected argument(s) used the following variable(s): [dockerhublogin]
                 See https://jenkins.io/redirect/groovy-string-interpolation for details.
+ docker login -u maulikd2397 -p ****
WARNING! Using --password via the CLI is insecure. Use --password-stdin.
WARNING! Your password will be stored unencrypted in /var/lib/jenkins/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
[Pipeline] }
[Pipeline] // withCredentials
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Stage - 5:
Push to docker hub

```
pipeline {
    agent any

    stages {
        stage('SCM_Checkout') {
            steps {
                git 'https://github.com/maulik2311/capstone-finance.git'
            }
        }
        stage('SourcecodeBuild') {
            steps {
                sh 'mvn clean package'
            }
        }
        stage('Dockerimage_build') {
            steps {
                sh 'docker version'
                sh "docker build -t maulikd2397/finance:${BUILD_NUMBER} ."
                sh "docker tag maulikd2397/finance:${BUILD_NUMBER} maulikd2397/finance:latest"
                sh 'docker images'
            }
        }
        stage('Login2Dockerhub') {
            steps {
                withCredentials([string(credentialsId: 'dockerhublogin', variable: 'dockerhublogin')]) {
                sh "docker login -u maulikd2397 -p ${dockerhublogin}"
                }
            }
        }
        stage('Push2Dockerhub') {
            steps {
                sh 'docker push maulikd2397/finance:latest'
            }
        }
    }
}
```

```
aad56a24b5af Pushed
latest: digest: sha256:089fac41445d8a2fe0c4ee82358ccc9a4fdb2b3e3435db1e550453fdcc92b08c size: 2007
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```



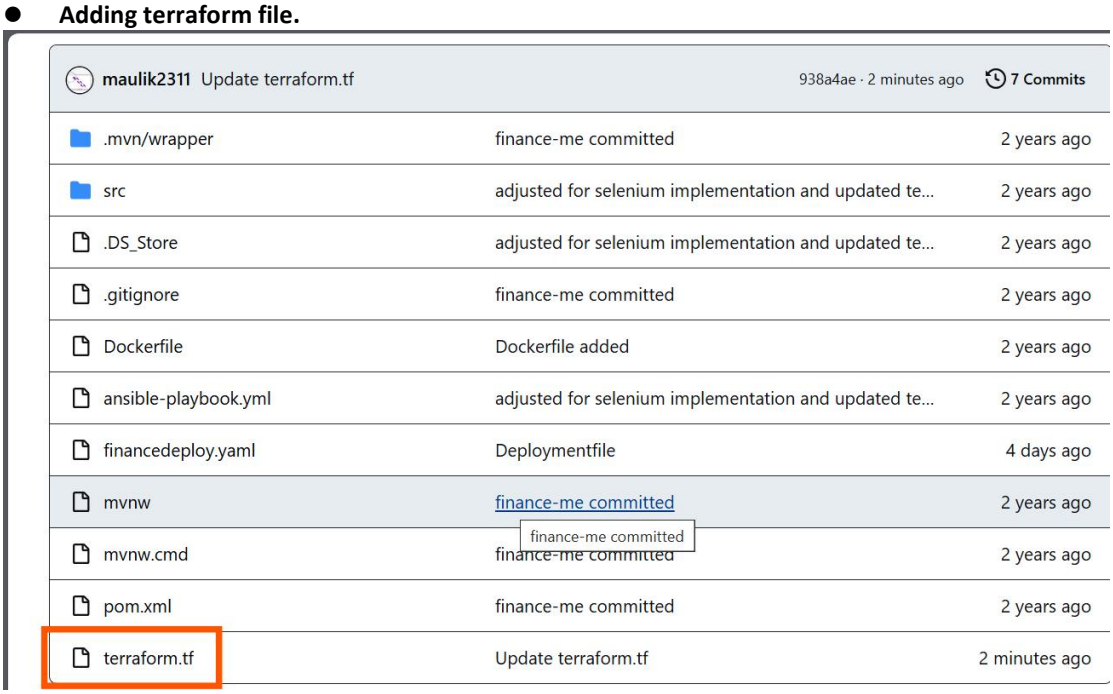
Still here:
Create pipeline for build and push the image to the dockehub

Server Provisioning using terraform

Test-server:

Aim: **A new test-server should be provisioned using terraform and should be automatically configured using Ansible with all the required software's and as soon as the server is available, the application must be deployed to the test-server automatically.**

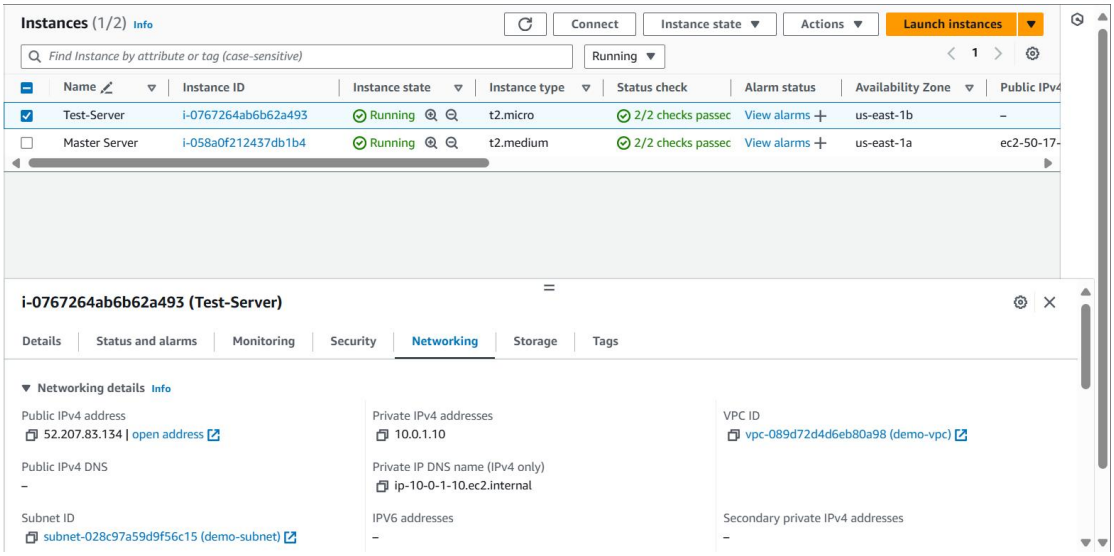
- **Adding terraform file.**



Stage- 6
terraform apply.

```
pipeline {
    agent any

    stages {
        stage('SCM_Checkout') {
            steps {
                git 'https://github.com/maulik2311/capstone-finance.git'
            }
        }
        stage('SourcecodeBuild') {
            steps {
                sh 'mvn clean package'
            }
        }
        stage('Dockerimage_build') {
            steps {
                sh 'docker version'
                sh "docker build -t maulikd2397/finance:${BUILD_NUMBER} ."
                sh "docker tag maulikd2397/finance:${BUILD_NUMBER} maulikd2397/finance:latest"
                sh 'docker images'
            }
        }
        stage('Login2Dockerhub') {
            steps {
                withCredentials([string(credentialsId: 'dockerhublogin', variable: 'dockerhublogin')]) {
                sh "docker login -u maulikd2397 -p ${dockerhublogin}"
                }
            }
        }
        stage('Push2Dockerhub') {
            steps {
                sh 'docker push maulikd2397/finance:latest'
            }
        }
        stage('Terrafrom apply') {
            steps {
                sh 'terraform init'
                sh 'terraform plan'
                sh 'terraform apply --auto-approve'
            }
        }
    }
}
```

```
[1mPlan:[0m 0 to add, 1 to change, 0 to destroy.
[0m[0m[1maws_instance.test_server: Modifying... [id=i-0767264ab6b62a493][0m[0m
[0m[1maws_instance.test_server: Modifications complete after 2s [id=i-0767264ab6b62a493][0m
[0m[1m[32m
Apply complete! Resources: 0 added, 1 changed, 0 destroyed.
[0m
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

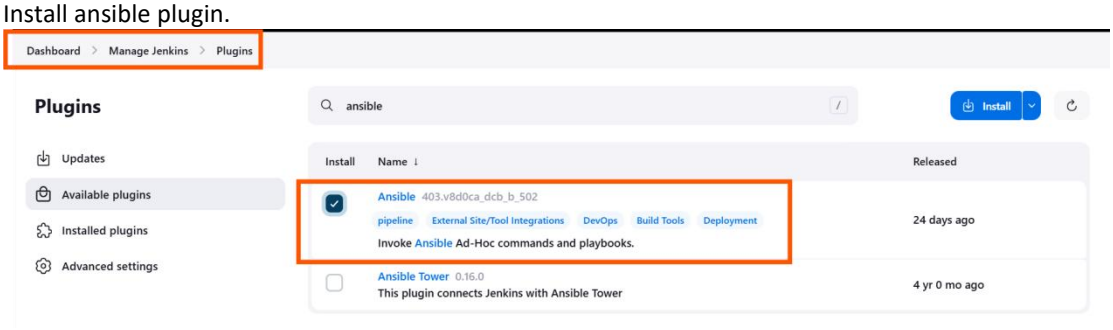


Configuration Test-Server using Ansible

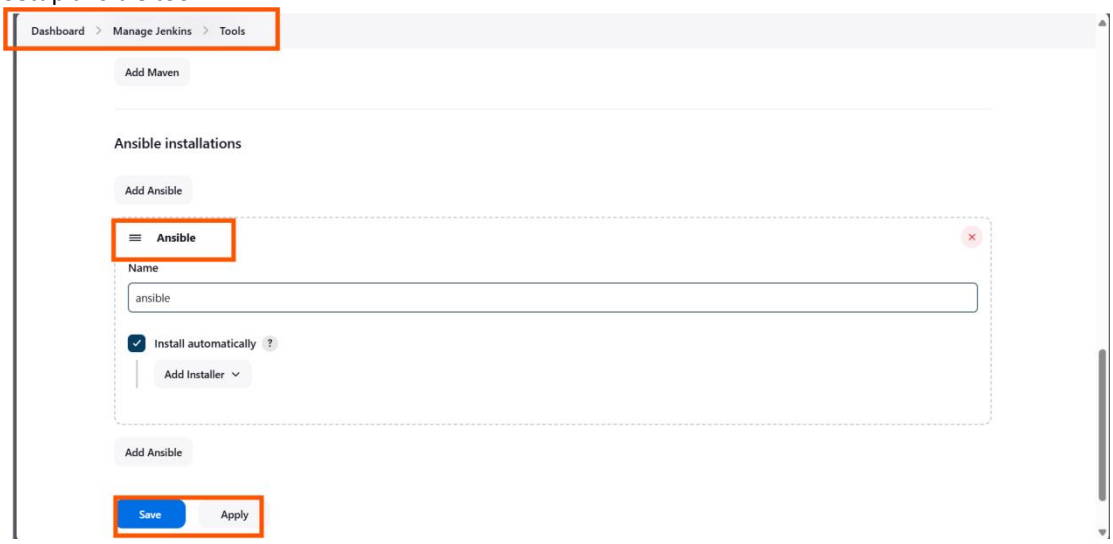
Provide Hosts to the ansible controller.

```
root@ip-172-31-25-153:/etc/ansible# cat hosts
[testnodes]
52.207.83.134
```

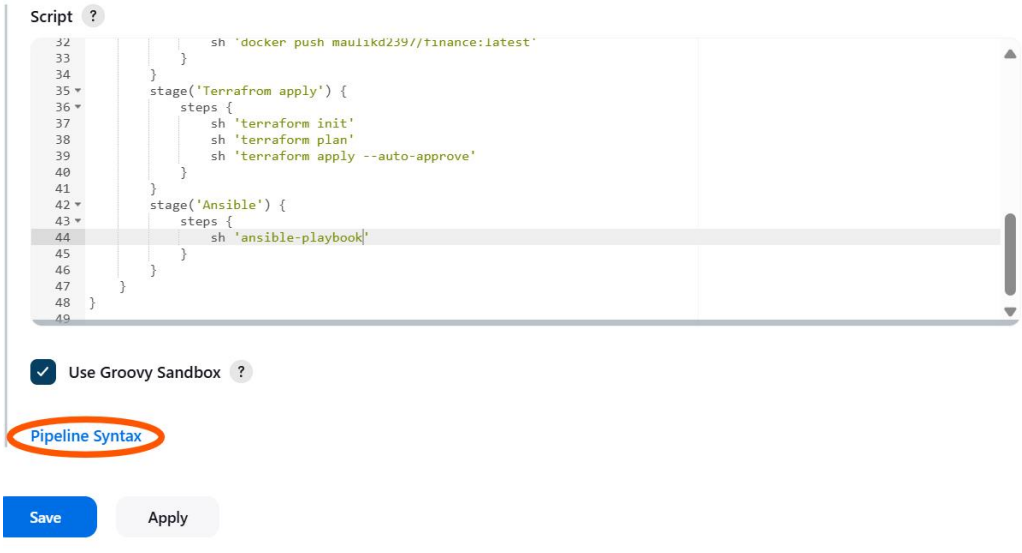
Install ansible plugin.



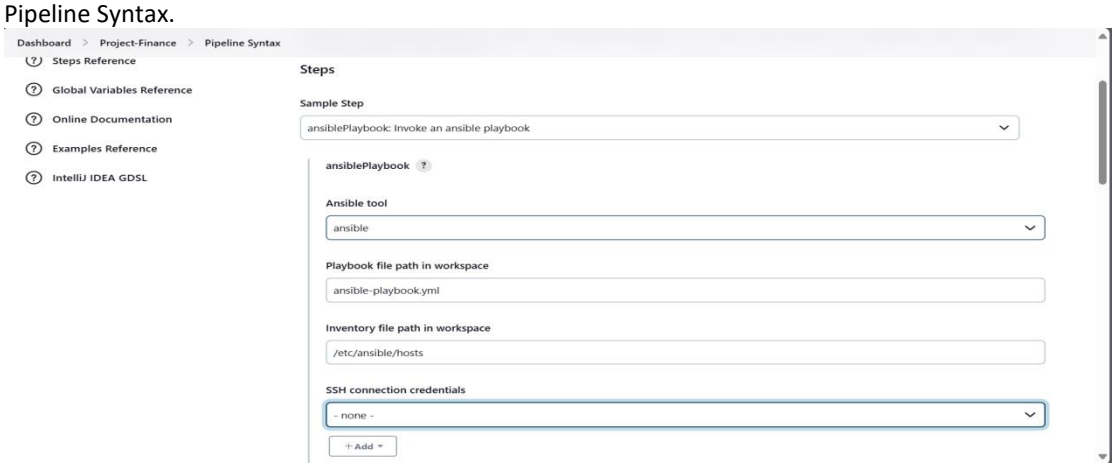
Setup ansible tool



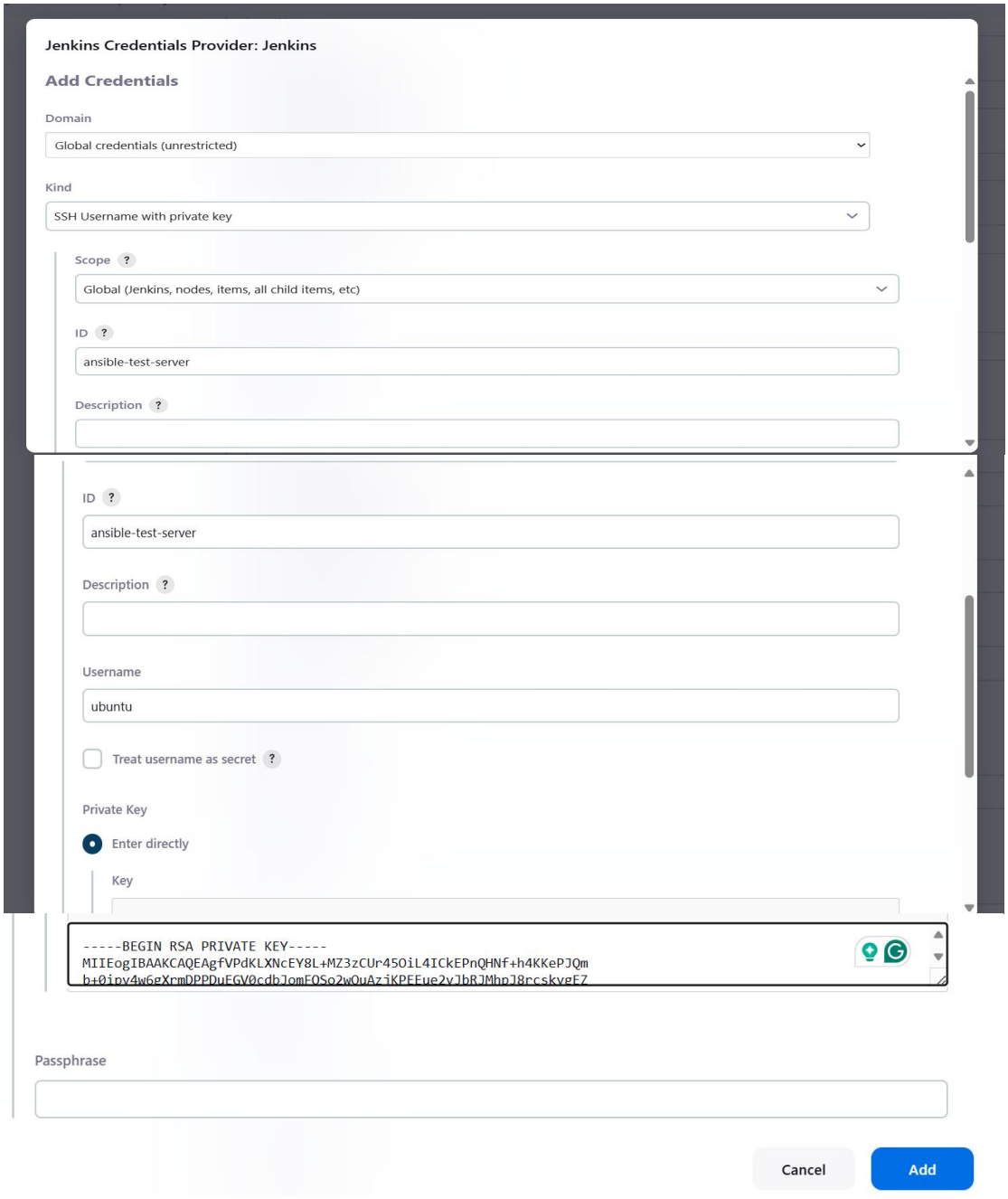
Pipeline syntax for providing ssh connection keys.



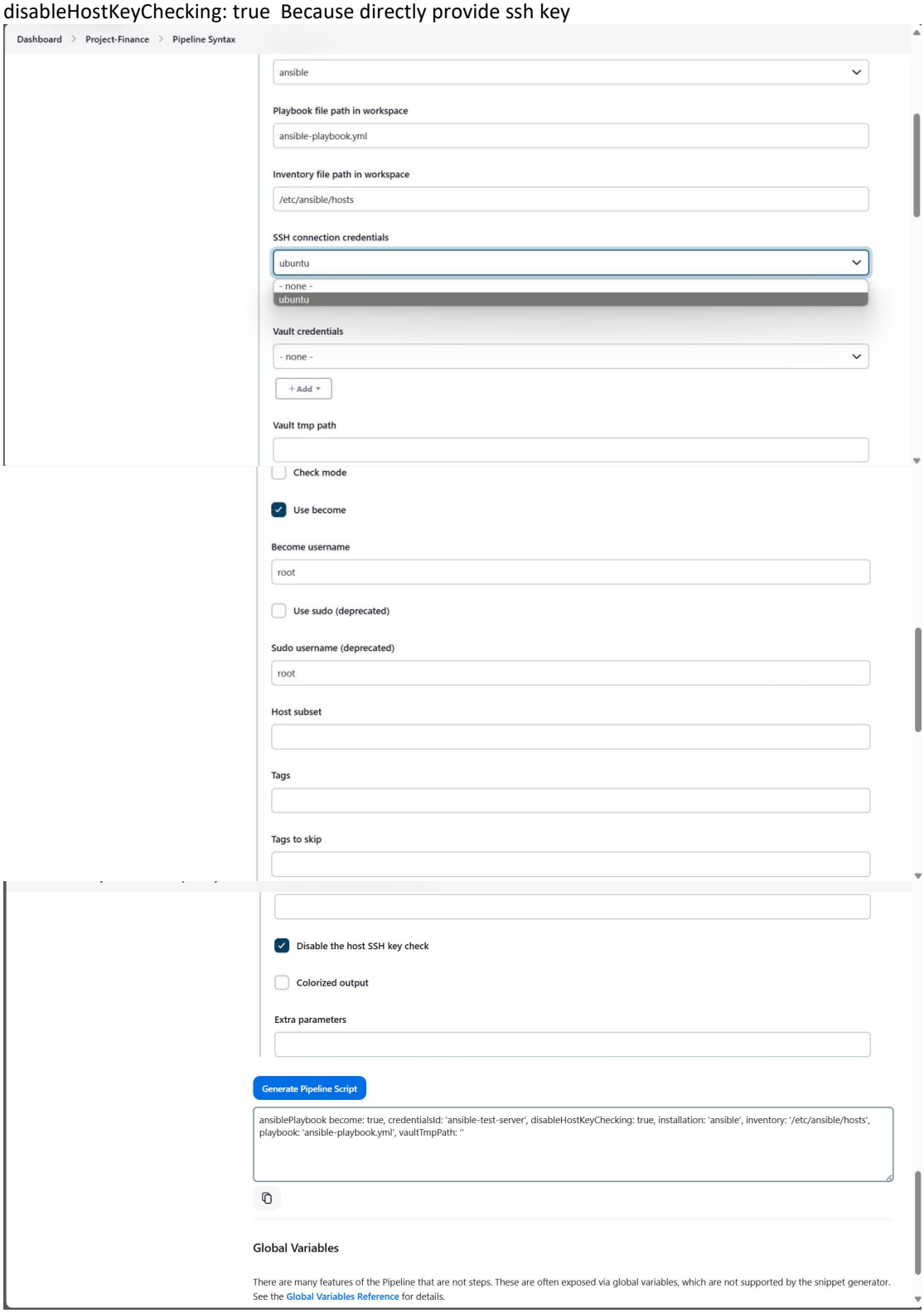
Pipeline Syntax.



Add SSH connection credentials. == Add

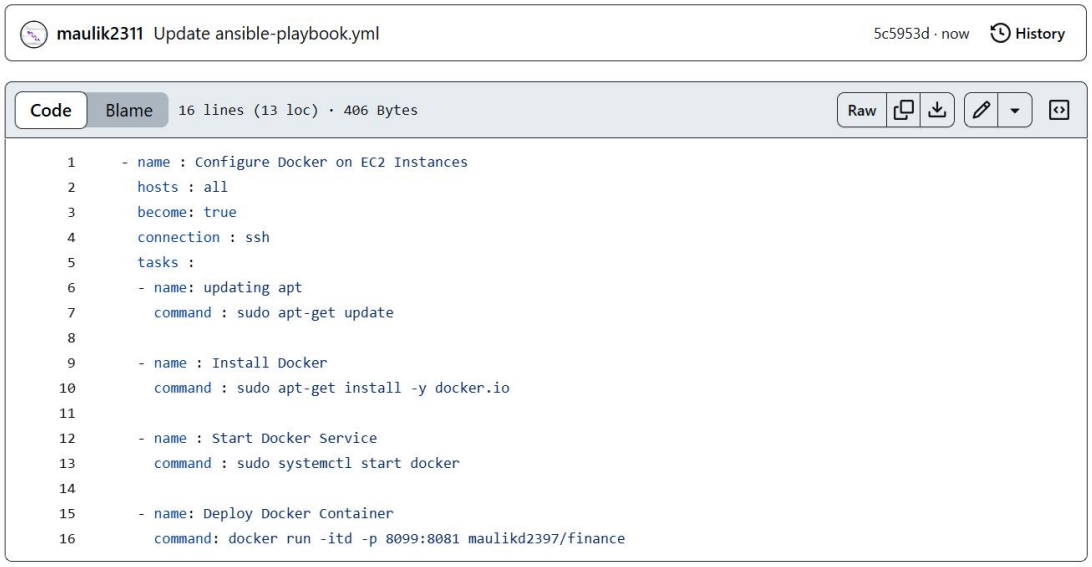


Copy pipeline script.
disableHostKeyChecking: true Because directly provide ssh key




```
        stage('Deploy with ansible') {
            steps {
                ansiblePlaybook become: true, credentialsId: 'ansible-test-server', disableHostKeyChecking: true, instal
            }
        }
    }
}
```

Modify ansible playbook.



maulik2311 Update ansible-playbook.yml 5c5953d · now History

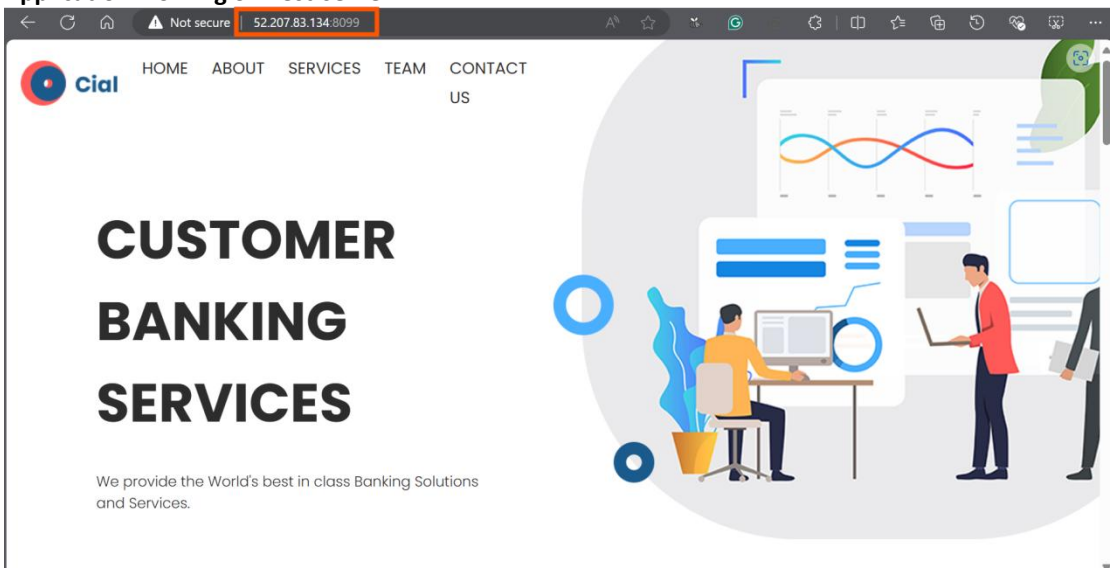
Code Blame 16 lines (13 loc) · 406 Bytes Raw

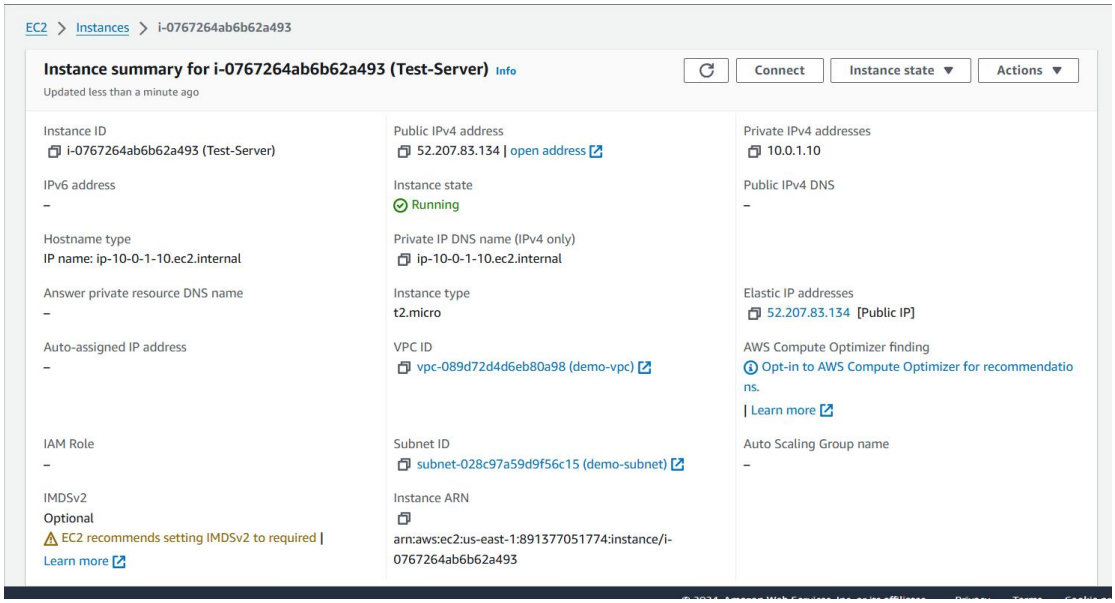
```
- name : Configure Docker on EC2 Instances
  hosts : all
  become: true
  connection : ssh
  tasks :
  - name: updating apt
    command : sudo apt-get update

  - name : Install Docker
    command : sudo apt-get install -y docker.io

  - name : Start Docker Service
    command : sudo systemctl start docker

  - name: Deploy Docker Container
    command: docker run -itd -p 8099:8081 maulikd2397/finance
```

Deploy success.

```
/var/lib/jenkins/workspace/Project-Finance/ssh15051195670194017806.key -u ubuntu

PLAY [Configure Docker on EC2 Instances] ***********************************

TASK [Gathering Facts] *****************************************************
ok: [52.207.83.134]

TASK [updating apt] ********************************************************
changed: [52.207.83.134]

TASK [Install Docker] ******************************************************
changed: [52.207.83.134]

TASK [Start Docker Service] ************************************************
changed: [52.207.83.134]

TASK [Deploy Docker Container] *********************************************
changed: [52.207.83.134]

PLAY RECAP *****************************************************************
52.207.83.134              : ok=5    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Application working on Test-server

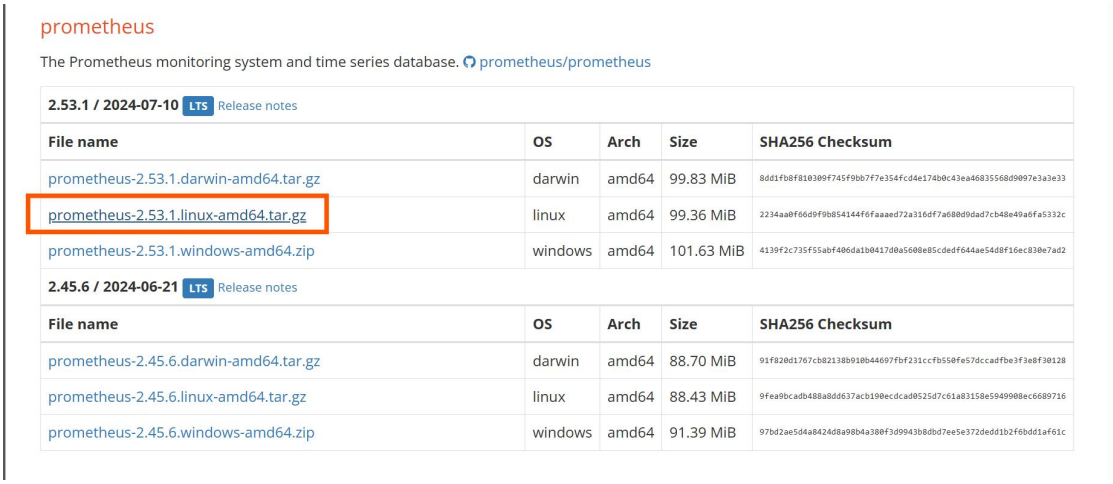




Prometheus and Grafana Server-3

- **Link to download the prometheus**

https://prometheus.io/download



prometheus

The Prometheus monitoring system and time series database. prometheus/prometheus

2.53.1 / 2024-07-10 LTS Release notes

File name	OS	Arch	Size	SHA256 Checksum
prometheus-2.53.1.darwin-amd64.tar.gz	darwin	amd64	99.83 MiB	8dd1fb8f810309f745f9bb7f7e354fcd4e174b0c43ea46835568d9097e3a3e33
prometheus-2.53.1.linux-amd64.tar.gz	linux	amd64	99.36 MiB	2234aa0f66d9f9b854144f6faaaed72a316df7a680d9dad7cb48e49a6fa5332c
prometheus-2.53.1.windows-amd64.zip	windows	amd64	101.63 MiB	4139f2c735f55abf406da1b0417d0a5608e85cdedf644ae54d8f16ec830e7ad2

2.45.6 / 2024-06-21 LTS Release notes

File name	OS	Arch	Size	SHA256 Checksum
prometheus-2.45.6.darwin-amd64.tar.gz	darwin	amd64	88.70 MiB	91f820d1767cb82138b910b44697fbf231ccfb550fe57dccadfbe3f3e8f30128
prometheus-2.45.6.linux-amd64.tar.gz	linux	amd64	88.43 MiB	9fea9bcadb488a8dd637acb190ecdcad0525d7c61a83158e5949908ec6689716
prometheus-2.45.6.windows-amd64.zip	windows	amd64	91.39 MiB	97bd2ae5d4a8424d8a98b4a380f3d9943b8dbd7ee5e372dedd1b2f6bdd1af61c

Download the package:

```
root@ip-172-31-94-104:~# wget https://github.com/prometheus/prometheus/releases/download/v2.53.1/prometheus-2.53.1.linux-amd64.tar.gz
--2024-07-12 15:30:07--  https://github.com/prometheus/prometheus/releases/download/v2.53.1/prometheus-2.53.1.linux-amd64.tar.gz
Resolving github.com (github.com)... 140.82.113.3
Connecting to github.com (github.com)|140.82.113.3|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/6838921/a3bb21a2-dbd7-4ab5-b939-884e332bd7bf?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20240712%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240712T152928Z&X-Amz-Expires=300&X-Amz-Signature=71f8460ddbb98c12e32feec5ac369a2466581ac83673a1ffef0a452244216214&X-Amz-SignedHeaders=host&actor_id=0&key_id=0&repo_id=6838921&response-content-disposition=attachment%3B%20filename%3Dprometheus-2.53.1.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream [following]
--2024-07-12 15:30:07--  https://objects.githubusercontent.com/github-production-release-asset-2e65be/6838921/a3bb21a2-dbd7-4ab5-b939-884e332bd7bf?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20240712%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240712T152928Z&X-Amz-Expires=300&X-Amz-Signature=71f8460ddbb98c12e32feec5ac369a2466581ac83673a1ffef0a452244216214&X-Amz-SignedHeaders=host&actor_id=0&key_id=0&repo_id=6838921&response-content-disposition=attachment%3B%20filename%3Dprometheus-2.53.1.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.109.133, 185.199.110.133, 185.199.111.133, ...
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.109.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 104191695 (99M) [application/octet-stream]
Saving to: 'prometheus-2.53.1.linux-amd64.tar.gz'

prometheus-2.53.1.linux-amd64.tar.gz   100%[===================================================================>]  99.36M   131MB/s    in 0.8s

2024-07-12 15:30:08 (131 MB/s) - 'prometheus-2.53.1.linux-amd64.tar.gz' saved [104191695/104191695]

root@ip-172-31-94-104:~# ls
prometheus-2.53.1.linux-amd64.tar.gz  snap
root@ip-172-31-94-104:~#
```

Unzip:

```
root@ip-172-31-94-104:~# tar -xvf prometheus-2.53.1.linux-amd64.tar.gz
prometheus-2.53.1.linux-amd64/
prometheus-2.53.1.linux-amd64/prometheus.yml
prometheus-2.53.1.linux-amd64/prometheus
prometheus-2.53.1.linux-amd64/consoles/
prometheus-2.53.1.linux-amd64/consoles/node-disk.html
prometheus-2.53.1.linux-amd64/consoles/node-overview.html
prometheus-2.53.1.linux-amd64/consoles/node-cpu.html
prometheus-2.53.1.linux-amd64/consoles/node.html
prometheus-2.53.1.linux-amd64/consoles/prometheus-overview.html
prometheus-2.53.1.linux-amd64/consoles/index.html.example
prometheus-2.53.1.linux-amd64/consoles/prometheus.html
prometheus-2.53.1.linux-amd64/LICENSE
prometheus-2.53.1.linux-amd64/promtool
prometheus-2.53.1.linux-amd64/console_libraries/
prometheus-2.53.1.linux-amd64/console_libraries/menu.lib
prometheus-2.53.1.linux-amd64/console_libraries/prom.lib
prometheus-2.53.1.linux-amd64/NOTICE
root@ip-172-31-94-104:~# ls
prometheus-2.53.1.linux-amd64  prometheus-2.53.1.linux-amd64.tar.gz  snap
root@ip-172-31-94-104:~#
```

- **Components of Package with usage:**
  - **"prometheus*"- Executable as a service**
  - **prometheus.yml - Configuration File storage/Default properties**
  - **Promtool - Maintain tool and plugins**

```
root@ip-172-31-94-104:~/prometheus-2.53.1.linux-amd64# ll
total 261316
drwxr-xr-x 4 1001  127      4096 Jul 10 10:34 ./
drwx------ 5 root root      4096 Jul 12 15:32 ../
-rw-r--r-- 1 1001  127     11357 Jul 10 10:31 LICENSE
-rw-r--r-- 1 1001  127      3773 Jul 10 10:31 NOTICE
drwxr-xr-x 2 1001  127      4096 Jul 10 10:31 console_librarie
drwxr-xr-x 2 1001  127      4096 Jul 10 10:31 consoles/
-rwxr-xr-x 1 1001  127 137823986 Jul 10 10:18 prometheus*
-rw-r--r-- 1 1001  127       934 Jul 10 10:31 prometheus.yml
-rwxr-xr-x 1 1001  127 129719462 Jul 10 10:18 promtool*
```

Default port:

- Prometheus : 9090
- Grafana : 3000
- Node Exporter (Agent): 9100

- **Configure the prometheus service on server**
- **It use to run prometheus service; by default prometheus work on service**

-$ sudo vi /etc/systemd/system/prometheus.service

[Unit]
Description=Prometheus Server
Documentation=https://prometheus.io/docs/introduction/overview/
After=network-online.target

[Service]
User=root
Restart=on-failure

ExecStart=/root/prometheus-2.53.1.linux-amd64/prometheus --config.file=/root/prometheus-2.53.1.linux-amd64/prometheus.yml

[Install]
WantedBy=multi-user.target

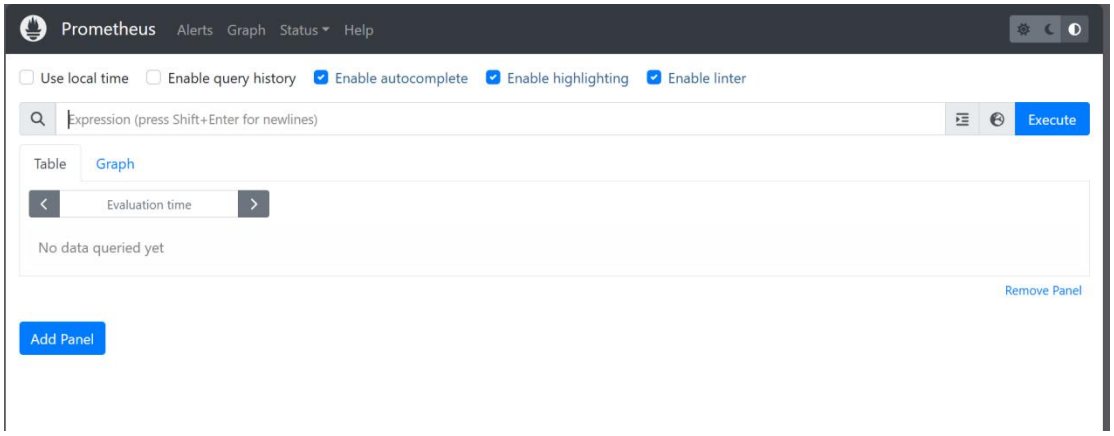
```
root@ip-172-31-94-104:~# cat /etc/systemd/system/prometheus.service
[Unit]
Description=Prometheus Server
Documentation=https://prometheus.io/docs/introduction/overview/
After=network-online.target

[Service]
User=root
Restart=on-failure

ExecStart=/root/prometheus-2.53.1.linux-amd64/prometheus --config.file=/root/prometheus-2.53.1.linux-amd64/prometheus.yml

[Install]
WantedBy=multi-user.target
```

- **Reload the daemon**

-$ sudo systemctl daemon-reload

```
root@ip-172-31-94-104:~# systemctl daemon-reload
root@ip-172-31-94-104:~# systemctl start prometheus
root@ip-172-31-94-104:~# systemctl status prometheus
● prometheus.service - Prometheus Server
     Loaded: loaded (/etc/systemd/system/prometheus.service; disabled; vendor preset: enabled)
     Active: active (running) since Fri 2024-07-12 15:43:07 UTC; 1min 9s ago
       Docs: https://prometheus.io/docs/introduction/overview/
   Main PID: 2013 (prometheus)
      Tasks: 6 (limit: 1120)
     Memory: 18.9M
        CPU: 93ms
     CGroup: /system.slice/prometheus.service
             └─2013 /root/prometheus-2.53.1.linux-amd64/prometheus --config.file=/root/prometheus-2.53.1.linux-amd64/prometheus.yml

Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.063Z caller=tls_config.go:316 level=info component=web msg="TLS is disabled." >
Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.064Z caller=head.go:793 level=info component=tsdb msg="WAL segment loaded" seg>
Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.064Z caller=head.go:830 level=info component=tsdb msg="WAL replay completed" ch>
Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.066Z caller=main.go:1169 level=info fs_type=EXT4_SUPER_MAGIC
Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.066Z caller=main.go:1172 level=info msg="TSDB started"
Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.067Z caller=main.go:1354 level=info msg="Loading configuration file" filename=>
Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.073Z caller=main.go:1391 level=info msg="updated GOGC" old=100 new=75
Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.073Z caller=main.go:1402 level=info msg="Completed loading of configuration fi>
Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.074Z caller=main.go:1133 level=info msg="Server is ready to receive web reques>
Jul 12 15:43:07 ip-172-31-94-104 prometheus[2013]: ts=2024-07-12T15:43:07.074Z caller=manager.go:164 level=info component="rule manager" msg="Starting r>
lines 1-21/21 (END)
```

Prometheus Dashboard.



Node Exporter:

- **Attach Target-Nodes.**
- **Install the agent on target node and node name configure on prometheus config file.**
- **Target node:** 1>Master Server 2> Test-Server

-$ wget https://github.com/prometheus/node_exporter/releases/download/v1.4.0-rc.0/node_exporter-1.4.0-rc.0.linux-amd64.tar.gz

Master server.

```
root@ip-172-31-25-153:~# wget https://github.com/prometheus/node_exporter/releases/download/v1.4.0-rc.0/node_ex
--2024-07-12 15:51:10--  https://github.com/prometheus/node_exporter/releases/download/v1.4.0-rc.0/node_exporte
Resolving github.com (github.com)... 140.82.113.4
Connecting to github.com (github.com)|140.82.113.4|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/9524057/8a22ea2a-4a82-41
HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20240712%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240
ure=8750e1ef6e1d96f6c987cd3c01b0249b7e4863d4dbf090bc15a62d3f130563ac&X-Amz-SignedHeaders=host&actor_id=0&key_id
ition=attachment%3B%20filename%3Dnode_exporter-1.4.0-rc.0.linux-amd64.tar.gz&response-content-type=application%
--2024-07-12 15:51:11--  https://objects.githubusercontent.com/github-production-release-asset-2e65be/9524057/8
Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20240712%2Fus-east-1%2Fs3%2Faws4_request&X
00&X-Amz-Signature=8750e1ef6e1d96f6c987cd3c01b0249b7e4863d4dbf090bc15a62d3f130563ac&X-Amz-SignedHeaders=host&ac
-content-disposition=attachment%3B%20filename%3Dnode_exporter-1.4.0-rc.0.linux-amd64.tar.gz&response-content-ty
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.108.133, 185.199.109.133, 18
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.108.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 9735268 (9.3M) [application/octet-stream]
Saving to: 'node_exporter-1.4.0-rc.0.linux-amd64.tar.gz'

node_exporter-1.4.0-rc.0.linux-amd64.t 100%[=============================================================

2024-07-12 15:51:11 (143 MB/s) - 'node_exporter-1.4.0-rc.0.linux-amd64.tar.gz' saved [9735268/9735268]

root@ip-172-31-25-153:~# ls
ansible.sh  jenkins.sh  node_exporter-1.4.0-rc.0.linux-amd64.tar.gz  snap  terraform.sh
root@ip-172-31-25-153:~# tar -xvf node_exporter-1.4.0-rc.0.linux-amd64.tar.gz
node_exporter-1.4.0-rc.0.linux-amd64/
node_exporter-1.4.0-rc.0.linux-amd64/LICENSE
node_exporter-1.4.0-rc.0.linux-amd64/NOTICE
node_exporter-1.4.0-rc.0.linux-amd64/node_exporter
root@ip-172-31-25-153:~# ls
ansible.sh  jenkins.sh  node_exporter-1.4.0-rc.0.linux-amd64  node_exporter-1.4.0-rc.0.linux-amd64.tar.gz  snap
root@ip-172-31-25-153:~#
```

Test-Server

```
root@ip-10-0-1-10:~# wget https://github.com/prometheus/node_exporter/releases/download/v1.4.0-rc.0/node_exporter-1
--2024-07-12 15:51:13--  https://github.com/prometheus/node_exporter/releases/download/v1.4.0-rc.0/node_exporter-1.4
Resolving github.com (github.com)... 140.82.113.3
Connecting to github.com (github.com)|140.82.113.3|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/9524057/8a22ea2a-4a82-412b-b0
HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20240712%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20240712T1
ure=dd8ae21d25c5163cc590c6a0aa2d7c03ec5e79a4c6961876a74c964b074b019f&X-Amz-SignedHeaders=host&actor_id=0&key_id=0&re
ition=attachment%3B%20filename%3Dnode_exporter-1.4.0-rc.0.linux-amd64.tar.gz&response-content-type=application%2Foct
--2024-07-12 15:51:13--  https://objects.githubusercontent.com/github-production-release-asset-2e65be/9524057/8a22ea
Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20240712%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-
00&X-Amz-Signature=dd8ae21d25c5163cc590c6a0aa2d7c03ec5e79a4c6961876a74c964b074b019f&X-Amz-SignedHeaders=host&actor_i
-content-disposition=attachment%3B%20filename%3Dnode_exporter-1.4.0-rc.0.linux-amd64.tar.gz&response-content-type=app
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.110.133, 185.199.111.133, 185.199
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.110.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 9735268 (9.3M) [application/octet-stream]
Saving to: 'node_exporter-1.4.0-rc.0.linux-amd64.tar.gz'

node_exporter-1.4.0-rc.0.linux-amd64.t 100%[=============================================================================

2024-07-12 15:51:14 (142 MB/s) - 'node_exporter-1.4.0-rc.0.linux-amd64.tar.gz' saved [9735268/9735268]

root@ip-10-0-1-10:~# ls
node_exporter-1.4.0-rc.0.linux-amd64.tar.gz  snap
root@ip-10-0-1-10:~# tar -xvf node_exporter-1.4.0-rc.0.linux-amd64.tar.gz
node_exporter-1.4.0-rc.0.linux-amd64/
node_exporter-1.4.0-rc.0.linux-amd64/LICENSE
node_exporter-1.4.0-rc.0.linux-amd64/NOTICE
node_exporter-1.4.0-rc.0.linux-amd64/node_exporter
root@ip-10-0-1-10:~# ls
node_exporter-1.4.0-rc.0.linux-amd64  node_exporter-1.4.0-rc.0.linux-amd64.tar.gz  snap
root@ip-10-0-1-10:~#
```

- **Configure Node-Exporter service on Target servers**

[Unit]
Description=Prometheus Server
Documentation=https://prometheus.io/docs/introduction/overview/
After=network-online.target

[Service]
User=root
Restart=on-failure

ExecStart=/root/node_exporter-1.4.0-rc.0.linux-amd64/node_exporter

[Install]
WantedBy=multi-user.target

On Master

```
root@ip-172-31-25-153:~# cat /etc/systemd/system/node_exporter.service
[Unit]
Description=Prometheus Server
Documentation=https://prometheus.io/docs/introduction/overview/
After=network-online.target

[Service]
User=root
Restart=on-failure

ExecStart=/root/node_exporter-1.4.0-rc.0.linux-amd64/node_exporter

[Install]
WantedBy=multi-user.target
```

On Test-Server

```
root@ip-10-0-1-10:~# cat /etc/systemd/system/node_exporter.service
[Unit]
Description=Prometheus Server
Documentation=https://prometheus.io/docs/introduction/overview/
After=network-online.target

[Service]
User=root
Restart=on-failure

ExecStart=/root/node_exporter-1.4.0-rc.0.linux-amd64/node_exporter

[Install]
WantedBy=multi-user.target
```

Reload daemon and start the service.

Master-server

```
root@ip-172-31-25-153:~#  systemctl daemon-reload
root@ip-172-31-25-153:~# systemctl status node_exporter.service
○ node_exporter.service - Prometheus Server
     Loaded: loaded (/etc/systemd/system/node_exporter.service; disabled; vendor preset: enabled)
     Active: inactive (dead)
       Docs: https://prometheus.io/docs/introduction/overview/
root@ip-172-31-25-153:~# systemctl status node_exporter
○ node_exporter.service - Prometheus Server
     Loaded: loaded (/etc/systemd/system/node_exporter.service; disabled; vendor preset: enabled)
     Active: inactive (dead)
       Docs: https://prometheus.io/docs/introduction/overview/
root@ip-172-31-25-153:~# systemctl start node_exporter
root@ip-172-31-25-153:~# systemctl status node_exporter
● node_exporter.service - Prometheus Server
     Loaded: loaded (/etc/systemd/system/node_exporter.service; disabled; vendor preset: enabled)
     Active: active (running) since Fri 2024-07-12 16:00:50 UTC; 2s ago
       Docs: https://prometheus.io/docs/introduction/overview/
   Main PID: 16024 (node_exporter)
      Tasks: 5 (limit: 4666)
     Memory: 2.4M
        CPU: 9ms
     CGroup: /system.slice/node_exporter.service
             └─16024 /root/node_exporter-1.4.0-rc.0.linux-amd64/node_exporter
```

Test-server

```
root@ip-10-0-1-10:~# systemctl deamon-reload
Unknown command verb deamon-reload.
root@ip-10-0-1-10:~# systemctl daemon-reload
root@ip-10-0-1-10:~# systemctl start node_exporter
root@ip-10-0-1-10:~# systemctl status node_exporter
● node_exporter.service - Prometheus Server
     Loaded: loaded (/etc/systemd/system/node_exporter.service; disabled; vendor preset: enabled)
     Active: active (running) since Fri 2024-07-12 16:01:09 UTC; 8s ago
       Docs: https://prometheus.io/docs/introduction/overview/
   Main PID: 3170 (node_exporter)
      Tasks: 3 (limit: 1120)
     Memory: 2.2M
        CPU: 9ms
     CGroup: /system.slice/node_exporter.service
             └─3170 /root/node_exporter-1.4.0-rc.0.linux-amd64/node_exporter

Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.706Z caller=node_exporter.go:115 level=info collector=thermal_zone
Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.706Z caller=node_exporter.go:115 level=info collector=time
Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.706Z caller=node_exporter.go:115 level=info collector=timex
Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.706Z caller=node_exporter.go:115 level=info collector=udp_queues
Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.706Z caller=node_exporter.go:115 level=info collector=uname
Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.707Z caller=node_exporter.go:115 level=info collector=vmstat
Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.707Z caller=node_exporter.go:115 level=info collector=xfs
Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.707Z caller=node_exporter.go:115 level=info collector=zfs
Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.707Z caller=node_exporter.go:199 level=info msg="Listening on" address=:9100
Jul 12 16:01:09 ip-10-0-1-10 node_exporter[3170]: ts=2024-07-12T16:01:09.708Z caller=tls_config.go:195 level=info msg="TLS is disabled." http2=false
```

Master

Test-server

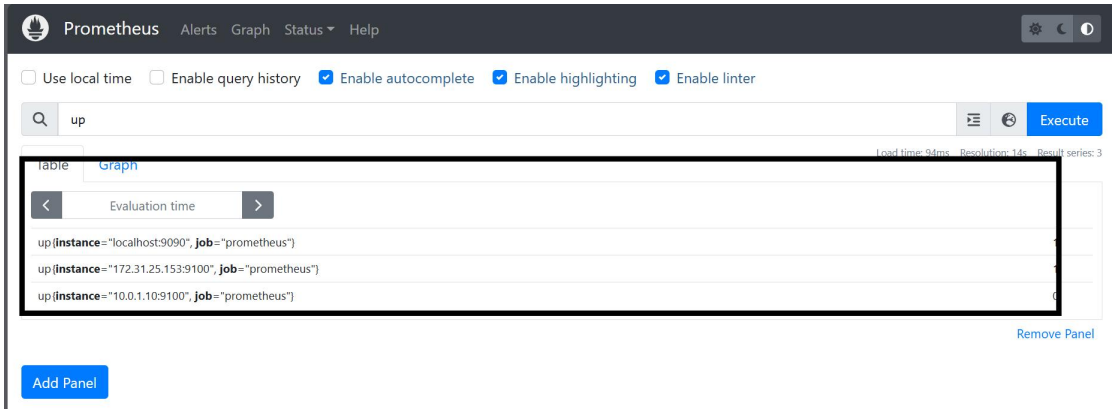
On Prometheus server:

- **Configure target server ip to Prometheus server(Connection)**
- **Provide target server ip to prometheus.yml file**

prometheus.yml

Add target node in prometheus.yml filr

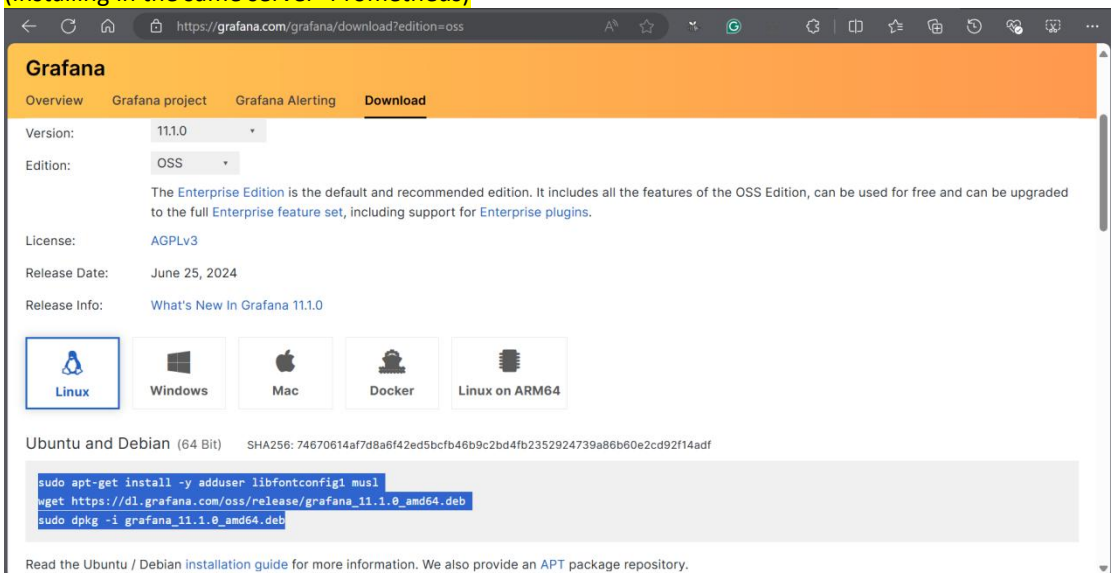
```
# my global config
global:
  scrape_interval: 15s # Set the scrape interval to every 15 seconds. Default is every 1 minute.
  evaluation_interval: 15s # Evaluate rules every 15 seconds. The default is every 1 minute.
  # scrape_timeout is set to the global default (10s).

# Alertmanager configuration
alerting:
  alertmanagers:
    - static_configs:
        - targets:
          # - alertmanager:9093

# Load rules once and periodically evaluate them according to the global 'evaluation_interval'.
rule_files:
  # - "first_rules.yml"
  # - "second_rules.yml"

# A scrape configuration containing exactly one endpoint to scrape:
# Here it's Prometheus itself.
scrape_configs:
  # The job name is added as a label `job=<job_name>` to any timeseries scraped from this config.
  - job_name: "prometheus"

    # metrics_path defaults to '/metrics'
    # scheme defaults to 'http'.

    static_configs:
      - targets: ["localhost:9090"]
      - targets: ["172.31.25.153:9100"]
      - targets: ["10.0.1.10:9100"]
~
~
"prometheus.yml" 31L, 1010B
```



Installation Grafana

- **Grafana is visualization tool that helps to create interior dashboard**

https://grafana.com/grafana/download?edition=oss
(Installing in the same server- Prometheus)



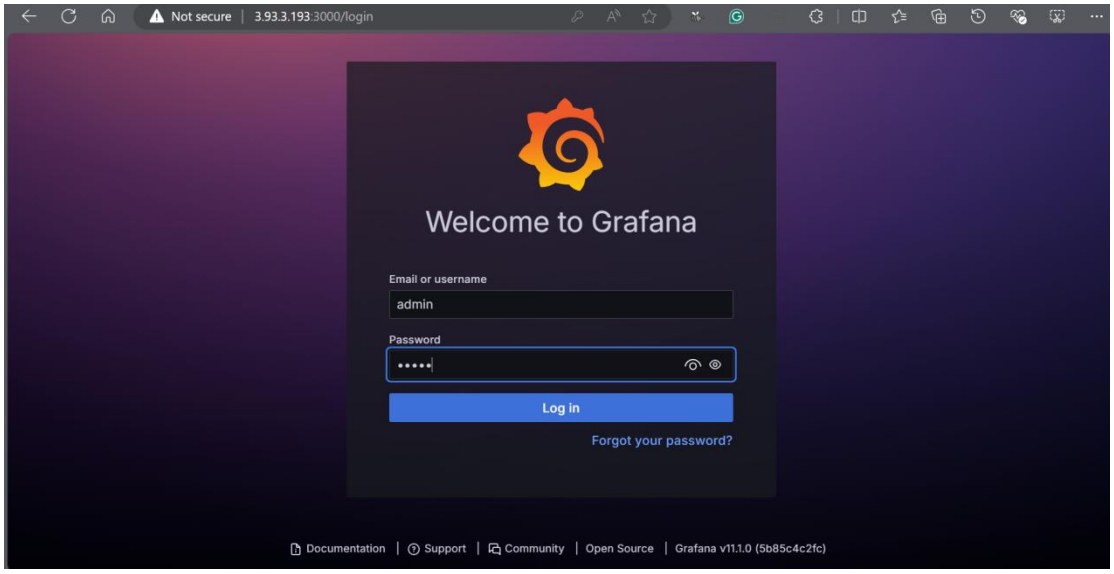
- **Reload daemon and start the service**

```
### NOT starting on installation, please execute the following statements to configure grafana to start automatically using systemd
 sudo /bin/systemctl daemon-reload
 sudo /bin/systemctl enable grafana-server
### You can start grafana-server by executing
 sudo /bin/systemctl start grafana-server
root@ip-172-31-94-104:~/prometheus-2.53.1.linux-amd64# sudo /bin/systemctl daemon-reload
 sudo /bin/systemctl enable grafana-server
Synchronizing state of grafana-server.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable grafana-server
Created symlink /etc/systemd/system/multi-user.target.wants/grafana-server.service → /lib/systemd/system/grafana-server.service.
root@ip-172-31-94-104:~/prometheus-2.53.1.linux-amd64#
```

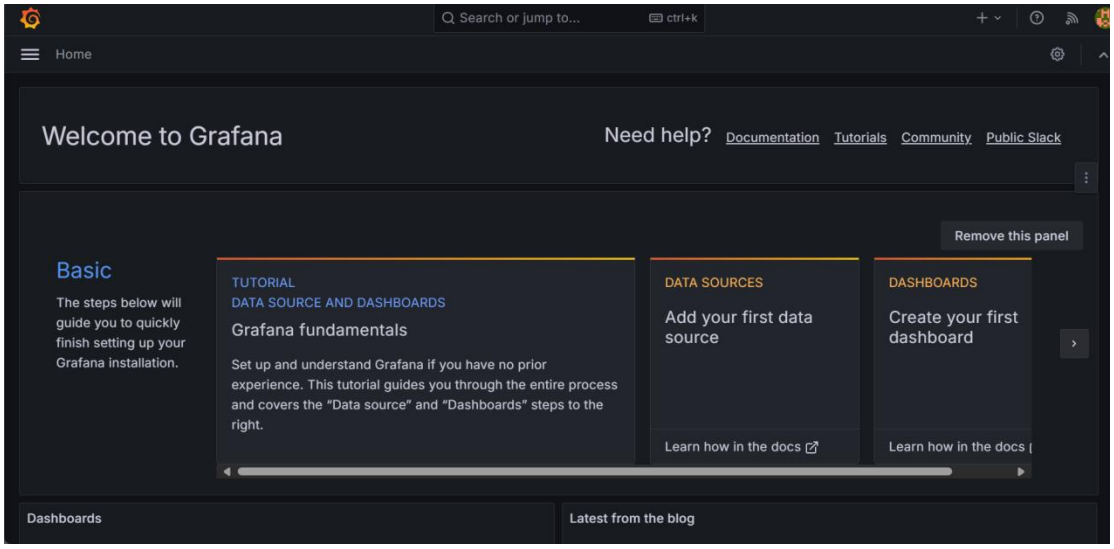
Start Grafana

```
root@ip-172-31-94-104:~/prometheus-2.53.1.linux-amd64# systemctl start grafana-server.service
root@ip-172-31-94-104:~/prometheus-2.53.1.linux-amd64# systemctl status grafana-server.service
● grafana-server.service - Grafana instance
     Loaded: loaded (/lib/systemd/system/grafana-server.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2024-07-12 16:19:18 UTC; 1s ago
       Docs: http://docs.grafana.org
   Main PID: 2592 (grafana)
      Tasks: 5 (limit: 1120)
     Memory: 33.1M
        CPU: 415ms
     CGroup: /system.slice/grafana-server.service
             └─2592 /usr/share/grafana/bin/grafana server --config=/etc/grafana/grafana.ini --pidfile=/run/grafana/grafana-server.pid --packaging=deb cf>

Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.297092426Z level=info msg="Migration successfully executed" id="cr>
Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.303415289Z level=info msg="Executing migration" id="add index api_>
Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.304446816Z level=info msg="Migration successfully executed" id="ad>
Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.313865209Z level=info msg="Executing migration" id="add index api_>
Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.31496698Z level=info msg="Migration successfully executed" id="ado>
Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.323557557Z level=info msg="Executing migration" id="add index api_>
Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.324574588Z level=info msg="Migration successfully executed" id="ad>
Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.333048324Z level=info msg="Executing migration" id="drop index IDX>
Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.334094597Z level=info msg="Migration successfully executed" id="dr>
Jul 12 16:19:20 ip-172-31-94-104 grafana[2592]: logger=migrator t=2024-07-12T16:19:20.342554963Z level=info msg="Executing migration" id="drop index UQE>
lines 1-21/21 (END)
```

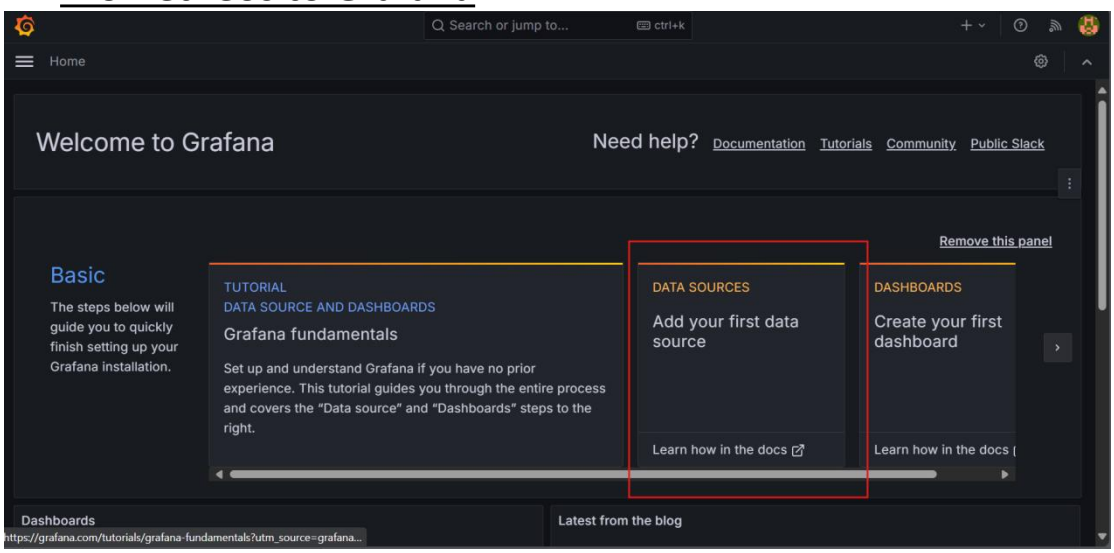
- **Grafana Default port: 3000**
- **Default Username- Password**
  - **admin**
  - **admin**



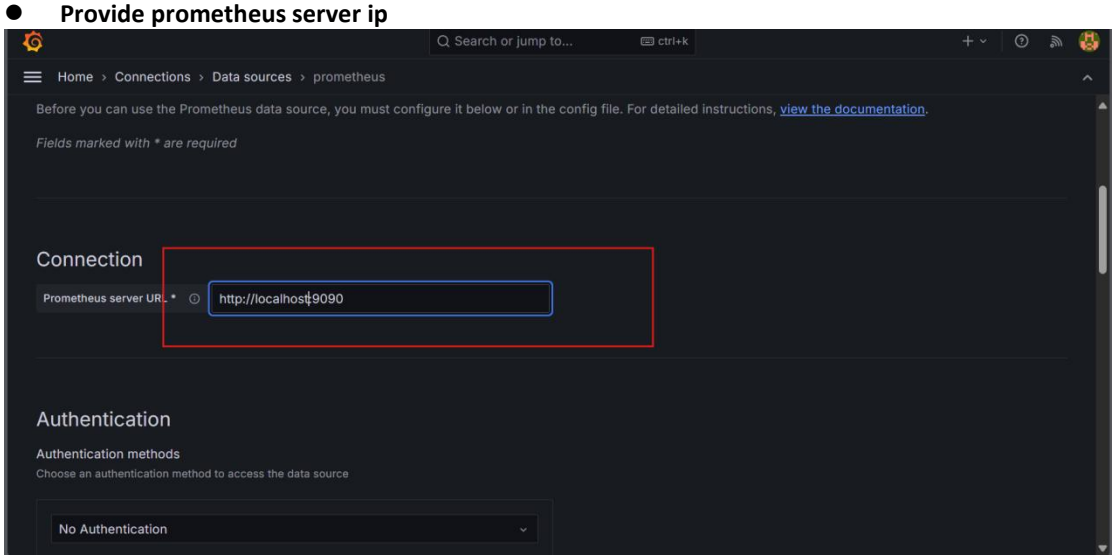
- **Grafana Dashboard:**

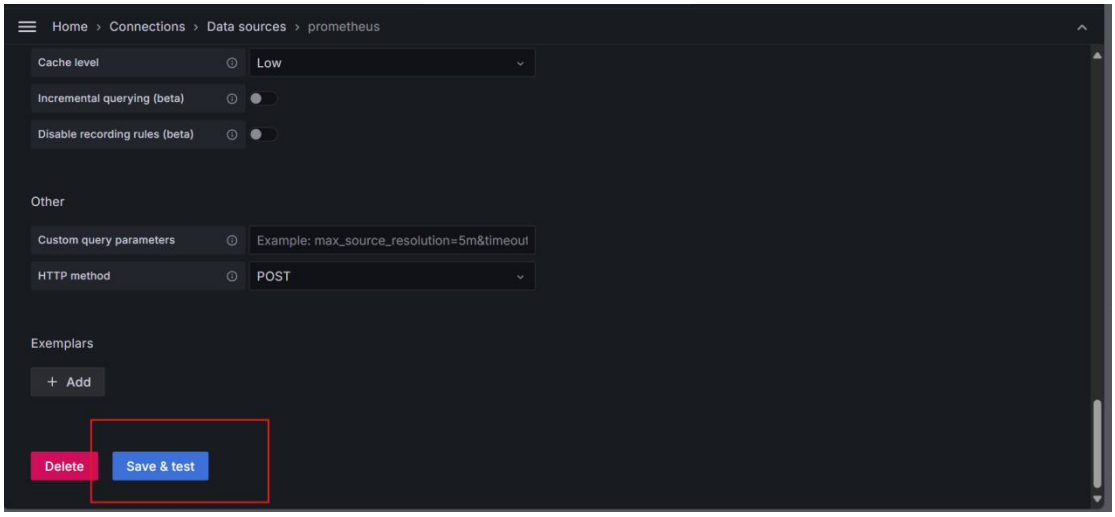


- **Attach Data Source to Grafana**
- **Prometheos to Grafana**



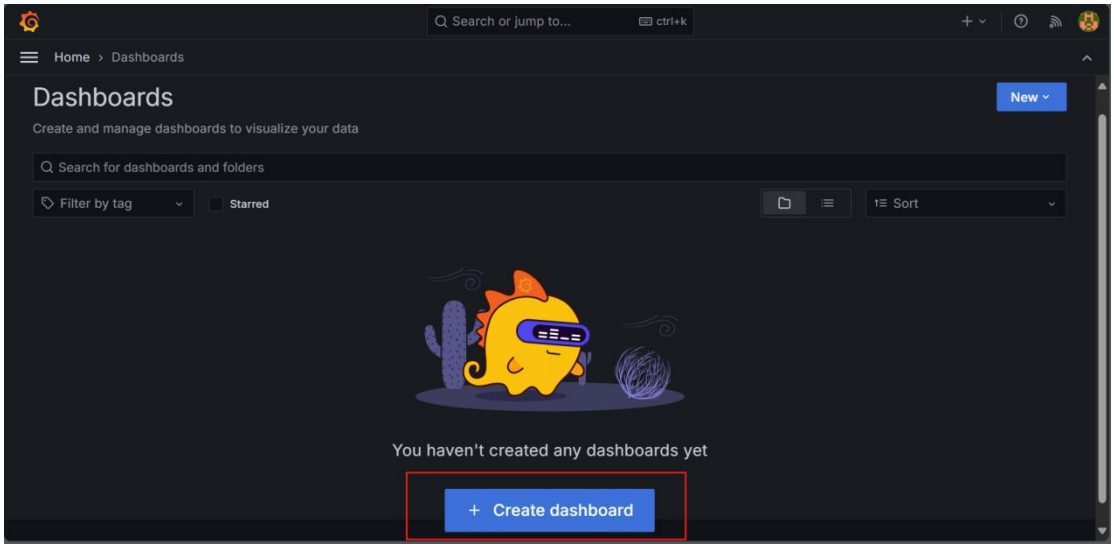
- **Provide prometheus server ip**



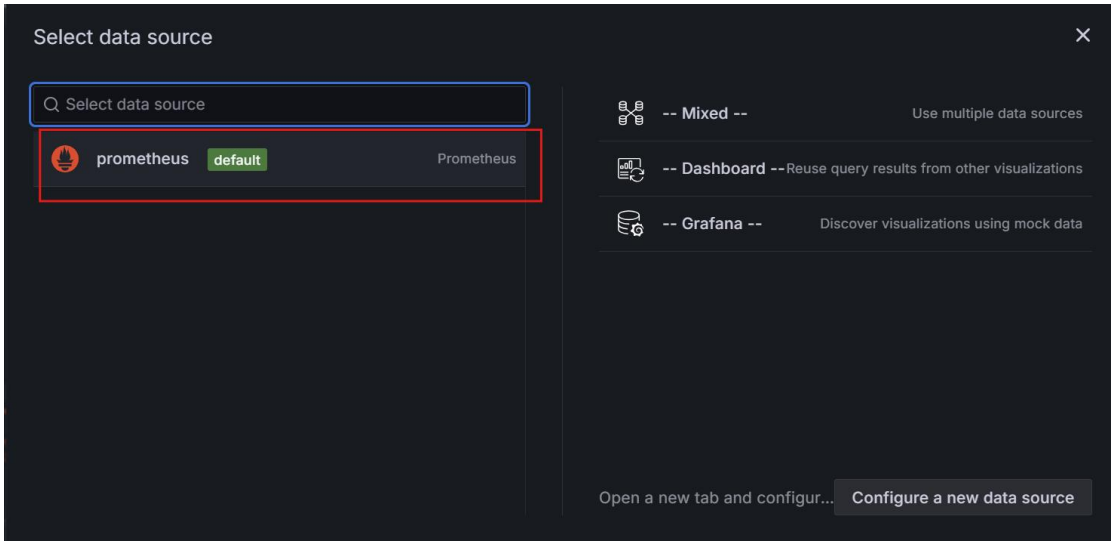


Save & Test

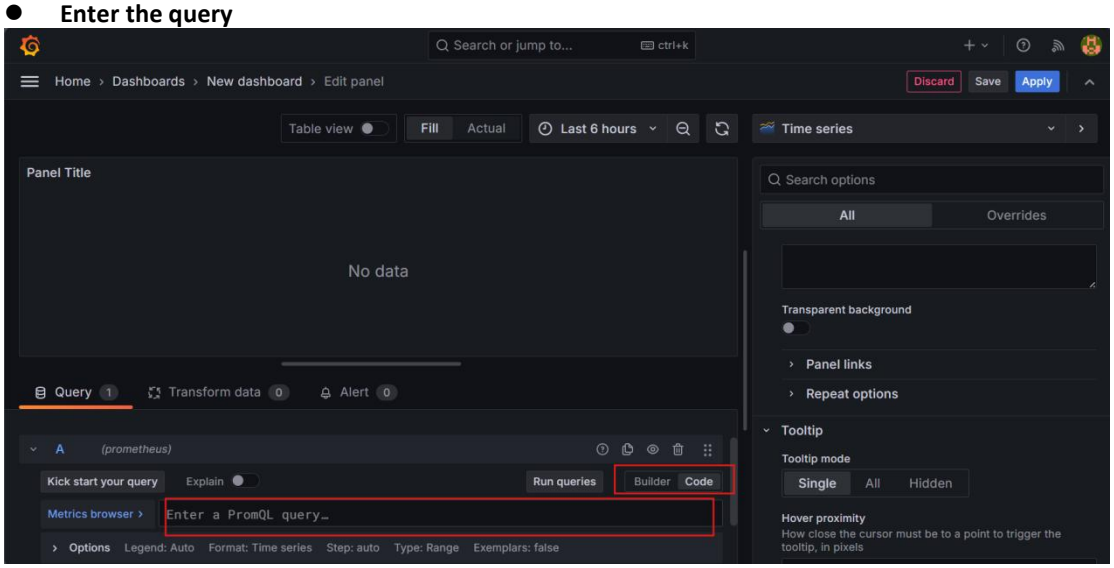
- **Create Dash-Board**



- **Select data source**

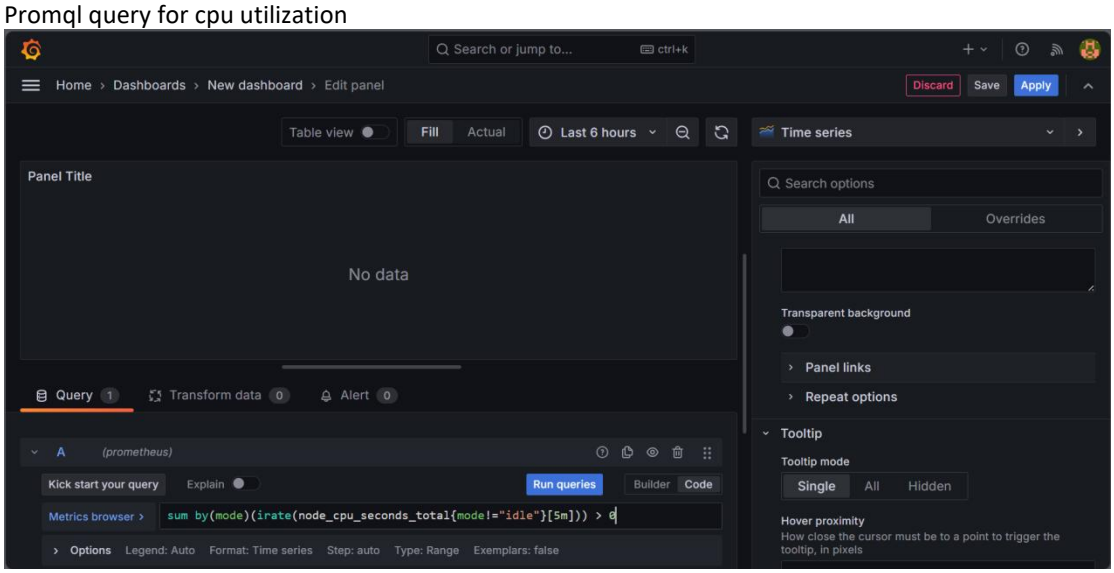


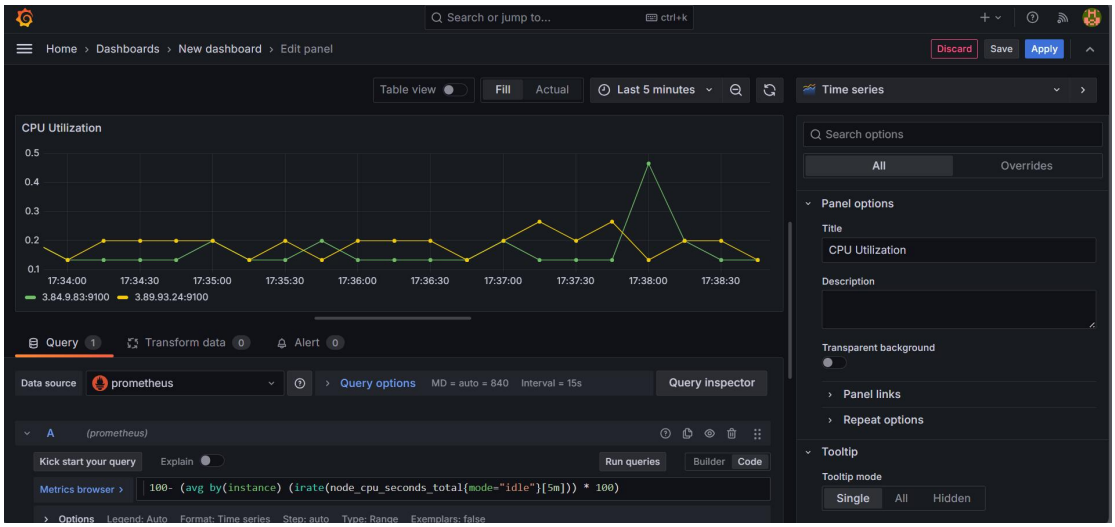
- **Enter the query**



- **Run query**

Promql query for cpu utilization





Queries

1. CPU Utilization

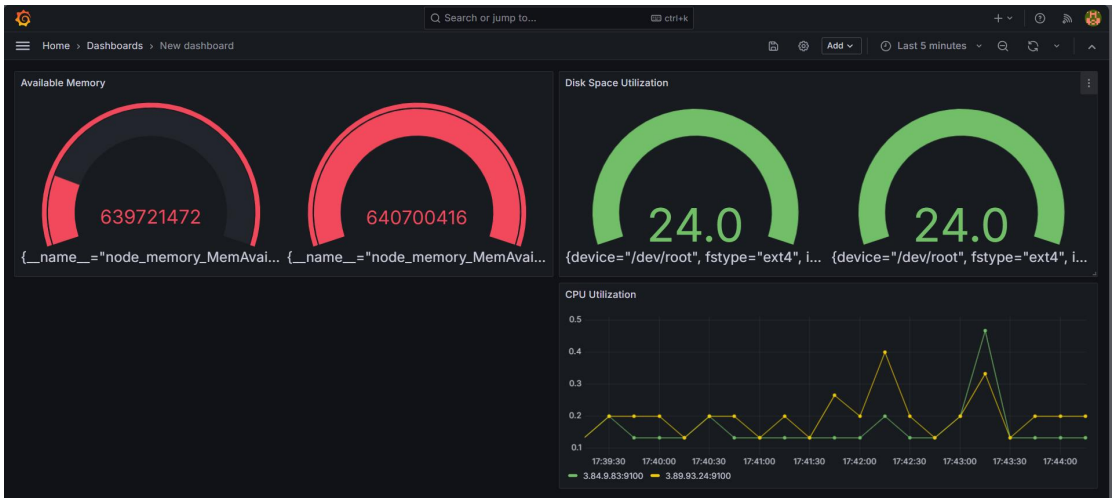
100 - (avg by(instance) (irate(node_cpu_seconds_total{mode="idle"}[5m])) * 100)

2. Disk Space Utilization

100 * (node_filesystem_size_bytes{fstype=~"ext4|xfs"} - node_filesystem_free_bytes{fstype=~"ext4|xfs"}) / node_filesystem_size_bytes{fstype=~"ext4|xfs"}

3. Total Available Memory

node_memory_MemAvailable_bytes



Jenkins Pipeline script.

```
pipeline {
   agent any

   stages {
      stage('SCM_Checkout') {
         steps {
            git 'https://github.com/maulik2311/capstone-finance.git'
         }
      }
      stage('SourcecodeBuild') {
         steps {
            sh 'mvn clean package'
         }
      }
      stage('Dockerimage_build') {
         steps {
            sh 'docker version'
            sh "docker build -t maulikd2397/finance:${BUILD_NUMBER} ."
            sh "docker tag maulikd2397/finance:${BUILD_NUMBER} maulikd2397/finance:latest"
            sh 'docker images'
         }
      }
      stage('Login2Dockerhub') {
         steps {
            withCredentials([string(credentialsId: 'dockerhublogin', variable: 'dockerhublogin')]) {
            sh "docker login -u maulikd2397 -p ${dockerhublogin}"
            }
         }
      }
      stage('Push2Dockerhub') {
         steps {
            sh 'docker push maulikd2397/finance:latest'
         }
      }
      stage('Terrafrom apply') {
         steps {
            sh 'terraform init'
            sh 'terraform plan'
            sh 'terraform apply --auto-approve'
         }
      }
      stage('Deploy with ansible') {
         steps {
            ansiblePlaybook become: true, credentialsId: 'ansible-test-server', disableHostKeyChecking:
true, installation: 'ansible', inventory: '/etc/ansible/hosts', playbook: 'ansible-playbook.yml',
vaultTmpPath: ''
         }
      }
   }
}
```

##########Thank you ##########