Install Jenkins and Setup Master and Slave config using JNLP or SSH
Check if the node/slave is connected

Configure global config
Manage jenkins → Global tool configuration

Jdk
Add jdk
Name: java
Untick install automatically
Java_home =/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.302.b08-0.amzn2.0.1.x86_64

/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.302.b08-0.amzn2.0.1.x86_64

Git

To find the path of git below is the command
Whereis git
/usr/bin/git **(ERROR1 optional)**

Maven add maven
Name : maven
Untick install automatically

To find the path of maven below is the command
Mvn -v
/usr/share/maven

Name : maven
Path : /usr/share/maven

Click Save

SETUP SONAR ON NEW SERVER

Launch at least instance type t2.medium because the minimum ram required for sonar is 4 gb

Install java

```
sudo amazon-linux-extras install java-openjdk11 -y
```

Check java path

```
sudo update-alternatives --config java
```

```
/usr/lib/jvm/java-11-openjdk-11.0.11.0.9-1.amzn2.0.1.x86_64/bin/java
```

Set environment variable

```
vim ~/.bash_profile
JAVA_HOME=”/usr/lib/jvm/java-11-openjdk-11.0.11.0.9-1.amzn2.0.1.x86_64/bin/java”
source ~/.bash_profile
```

Install sonarqube

download binary of sonar

```
wget https://binaries.sonarsource.com/Distribution/sonarqube/sonarqube-8.1.0.31237.zip
```

```
unzip sonarqube-8.1.0.31237.zip
```

```
cd sonarqube-8.1.0.31237/bin/linux-x86-64/
./sonar.sh console
```

Login using admin as username & password

http://50.17.69.175:9000/ (public ip of sonar server : 9000)

Navigate to admin logo which is at top right corner → click on my account → security → enter token name : sonaradmin → click on generate & copy token
d1ced1005c661658d60e9cfcfb8eae0002232cd0

Go to jenkins master server

Install sonar plugin

Managejenkins → manage plugins → available plugins → search plugin

SonarQube Scanner

& install without restart

Manage Jenkins → Configure system

SonarQube servers

Tick

Environment variables Enable injection of SonarQube server configuration as build environment variables

Click Add sonarqube
Name : sonarqube
http://publicip_of_sonarqube:9000
http://34.203.248.145:9000

Add credentials for sonarqube
Server authentication token
Add → jenkins → secret text in kind → Secret -- paste the token that was copied from sonar server → Description : sonar token →
click on none & select sonar token from drop down menu

Tools Path configuration
Manage jenkins → manage nodes & clouds → click on settings of node → tools location add →

GIT
To find the path of git below is the command
Whereis git (Execute this command on slave node)
/usr/bin/git

JAVA
To find the path of git below is the command
update alternatives command (Execute this command on slave node)
/usr/lib/jvm/java-1.8.0-openjdk-1.8.0.302.b08-0.amzn2.0.1.x86_64

MAVEN

To find the path of maven below is the command
mvn -v (Execute this command on slave node)
/usr/share/maven

Create a freestyle project

Create a job → name for the job : project1 → Freestyle project

Add the git repo https://github.com/Shivaraj600/java-maven-junit-helloworld.git

I have not added credentials as the repo is public

Add webhook in the git portal
Go to git web repo name
Settings webhook add webhook
Payload url :
http://public_ip_of_jenkins:8080/github-webhook/
http://54.162.56.96:8080/github-webhook/

Content type
application/json

configure
Let me select individual events
Tick
Branch or tag creation
Commit comments
Forks
Issues
Pull request review comments
Pull request review threads
Pull request reviews

Pull requests

Pushes

Active

Click on add/update webhook
Confirm the dot is replaced by tick, by this we can confirm that the connection is established between github & jenkins master server. The connection is checked by sending a packet to the jenkins server & upon receiving the response from the jenkins server it confirms the connectivity

Enable webhook trigger on jenkins master
GitHub hook trigger for GITScm polling

Build
Add build step
Invoke top level maven targets

Replace default with maven from drop down menu

Goal
clean install

Save → build now
(check all the components are working properly & then add sonar)

Now after checking that the build is successfully build add sonar scanner
Inside project manage
Tick on Prepare SonarQube Scanner environment &
Modify maven goal to
clean install sonar:sonar

Check if the build is successful
And we are able to see the sonar report at sonar dashboard & jenkins dashboard

Check if the webhook is triggered from git

Make some changes into the repo and commit

Now check if jenkins job is getting triggered by webhook below is the text that can be observed in the console output of the build number
Started by GitHub push by shivaraj600

Check if we are able to see results on sonarqube server as well as on jenkins

Add jacoco plugin
Manage plugins
JaCoCo
Install without restart

Configure on job

Post-build Actions
Record jacoco coverage report

Apply and save → click on build & check if report is generated → coverage report

Manually build & check if report is generated

CONFIGURE QUALITY GATES

Add plugin named Sonar Quality Gates

Configure the plugin

Manage jenkins → Configure system

Quality Gates - Sonarqube → Add Sonar instance

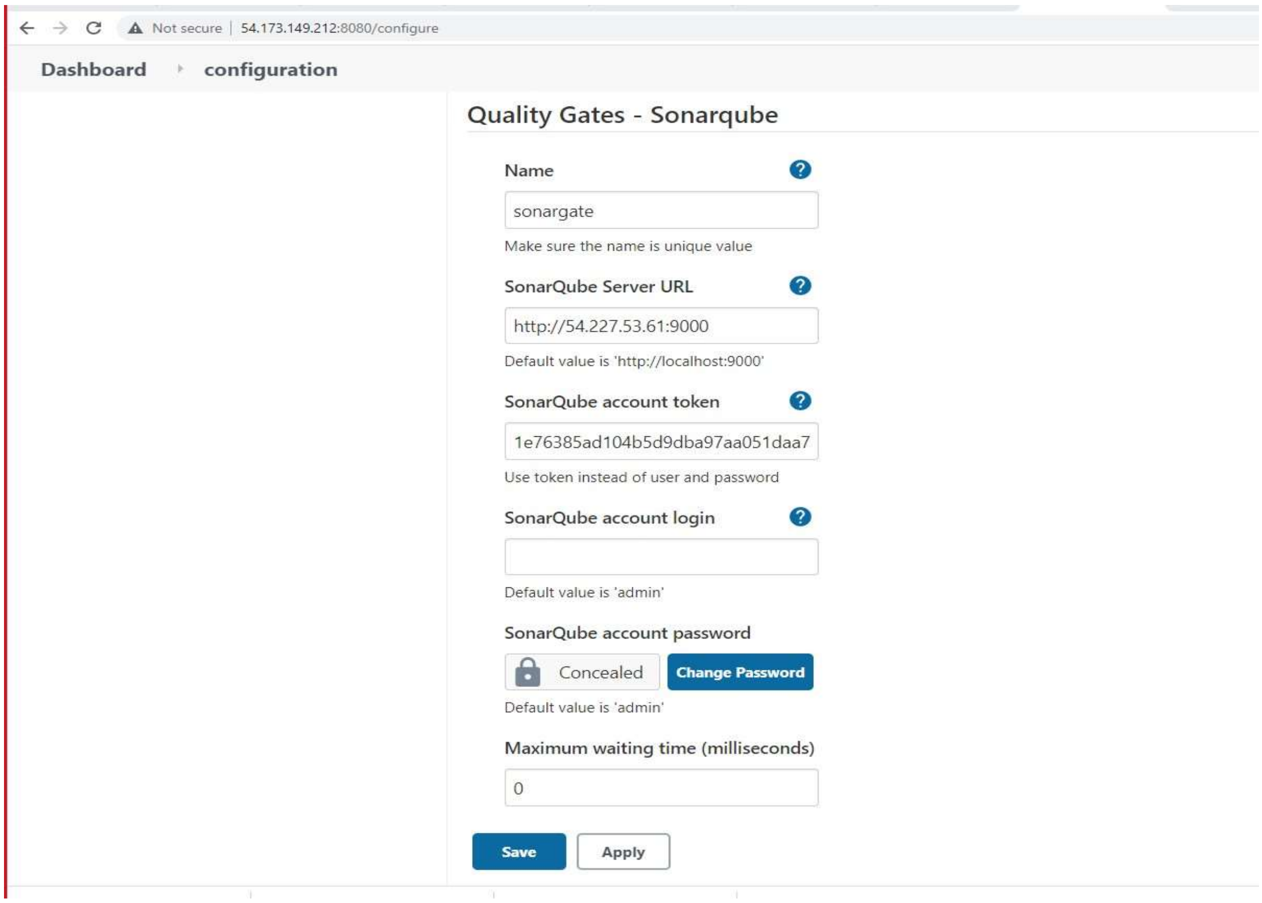
Quality Gates - Sonarqube

Name : sonargate
SonarQube Server URL: http://54.227.53.61:9000

SonarQube account token : add token

Username : admin
Password : admin

Minimum & maximum waiting time remove 0
Maximum waiting time (milliseconds)
Time to wait next check (milliseconds)


Not secure | 54.173.149.212:8080/configure

Dashboard › configuration

Quality Gates - Sonarqube

Name: sonargate
Make sure the name is unique value

SonarQube Server URL: http://54.227.53.61:9000
Default value is 'http://localhost:9000'

SonarQube account token: 1e76385ad104b5d9dba97aa051daa7
Use token instead of user and password

SonarQube account login:
Default value is 'admin'

SonarQube account password: Concealed
Default value is 'admin'

Maximum waiting time (milliseconds): 0

APPLY → SAVE

BUILD AND CHECK SONAR QUALITY GATE IS PASSED

Now we will create a custom sonar quality gate to check if the build fails

Login to sonar qube portal

CREATE CUSTOM QUALITY GATE

Quality gate → give name (customgateforcicd) Add

condition

Select overall code

Code smells is greater than 8

Coverage 96 (if code coverage is less than 96 percent the gate must fail) Lines to

cover 20 (if the lines

Uncovered line

CHECK IF THE STATUS FAILED IS DISPLAYED ON PROJECT WHEN NEW QUALITY GATE IS APPLIED

SonarQube Quality Gate

java-maven-junit-helloworld

FAILED

NOW ADD THE QUALITY GATE BUILD STEP INSIDE THE JOB

MANAGE THE JOB

Add post build action

Quality gates sonarqube plugin

Project key : copy from the project dashboard of sonarqube

Job status when analysis fails : FAILED

CHECK IN THE BUILD CONSOLE THE FOLLOWING LINES & BUILD IS FAILED

```
PostBuild-Step: Quality Gates plugin build passed: FALSE
Build step 'Quality Gates Sonarqube Plugin' marked build as failure Finished:
FAILURE
```

MAVEN BUILD PROCESS IS COMPLETED

NOW START THE DOCKER BUILD PROCESS

Reset the quality gate to default to check the next build process from sonarqube dashboard

DOCKER

Add following docker plugins

Docker

docker- build-step

Cloudbees

Install without restart

Install docker on linux slave machine sudo

amazon-linux-extras install docker -y sudo

service docker start

sudo docker info

CREATE JOB 2 for docker build & push to docker hub

Copy from job 1 & edit

Remove sonarqube quality gates plugin

ADD DOCKER BUILD & PUBLISH PLUGIN in add build step

Create a public docker repo name in docker hub & add it in jenkins
Repo name
shivaraj123/cicdnewjenkins

Tag
$BUILD_ID

We build docker image on the jenkins server itself so we do not add server url

Add registry credentials

Username :
Password:
Description: docker credentials
Select docker credentials save & build the job

Now restrict docker to run on the slave machine only
Restrict where this project can be run : linuxnode1

Check on docker hub if the repo is pushed with the image id tag of build number
Note : that the job id is appended to the tag of docker hub

Now check if job1 is able to trigger job 2 if sonar gates are passed

As the default gates are used the build will be passed configure the below to trigger job 2 when job 1 is successfully completed

Edit project 1
ADD POST BUILD ACTION :
build other projects
Enter : project2
Tick : Trigger only if build is stable

Build job 1 : and confirm the below lines in the console output of job 1

```
Status => SUCCESS
PostBuild-Step: Quality Gates plugin build passed: TRUE
Triggering a new build of project2
Finished: SUCCESS
```

Confirm the job2 is completed
Check in the docker hub if the new image is pushed

Now apply the custom gate from sonar & check if the build fails
Manually build job 1

```
PostBuild-Step: Quality Gates plugin build passed: FALSE
Build step 'Quality Gates Sonarqube Plugin' marked build as failure
Finished: FAILURE
```

CREATE JOB 3 Named cd job
Create a third project for cd job

Execute shell

```
docker pull shivaraj123/cicdnewjenkins:latest
docker run -d --name jenkins shivaraj123/cicdnewjenkins:latest
```

We have to

and configure job3 have to build if job2 is succes

TILL THIS STEP THE CI CD IS COMPLETED