

PROJECT-2

Course: DevOps

Name: Vanguri Raja Vamsy

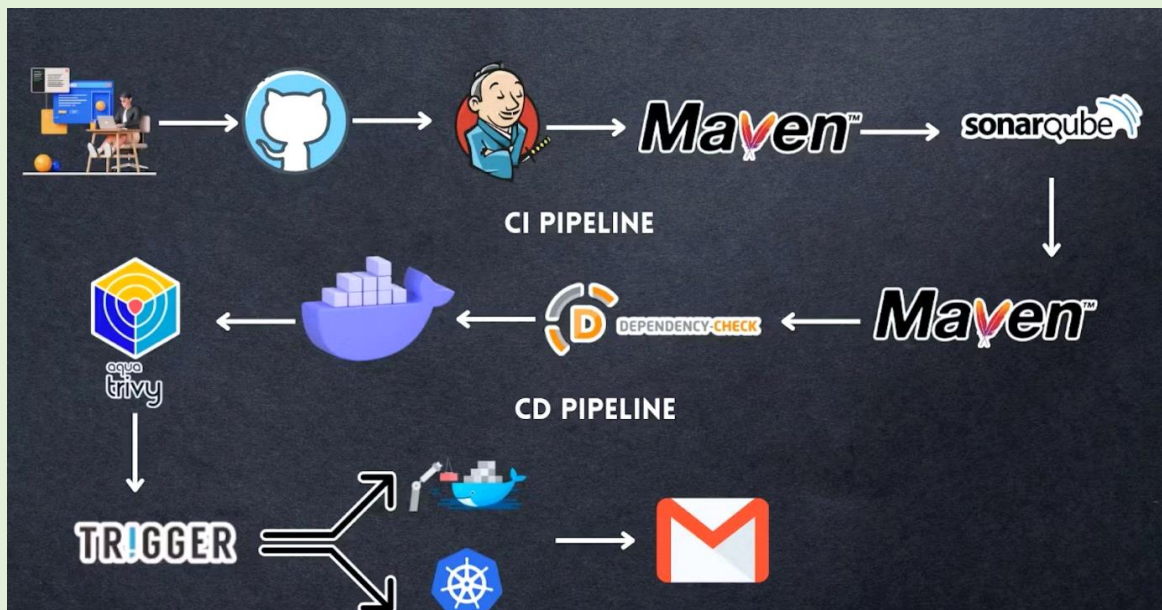
Batch No: 115 (9am-10am)

Mail id: rajavamsyvanguri@gmail.com

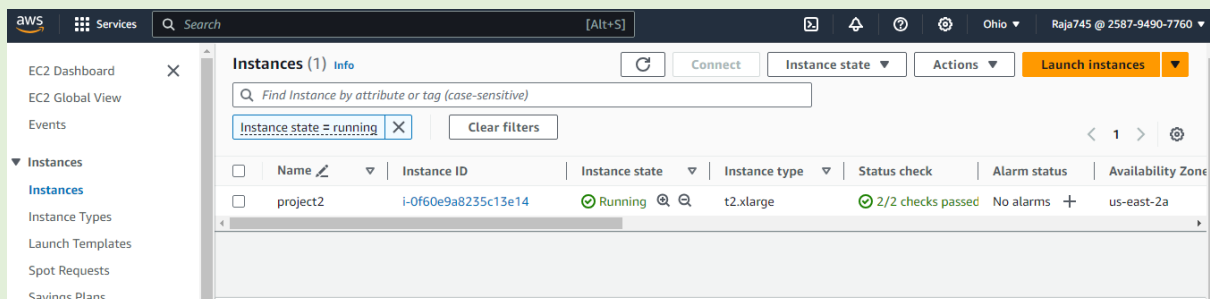
Trainer Name: Mr. Madhukar Reddy

Date: 22-12-23

Topic: DEVSECOPS Project: Complete CI-CD (3 tier app)-Dockerjenkins.

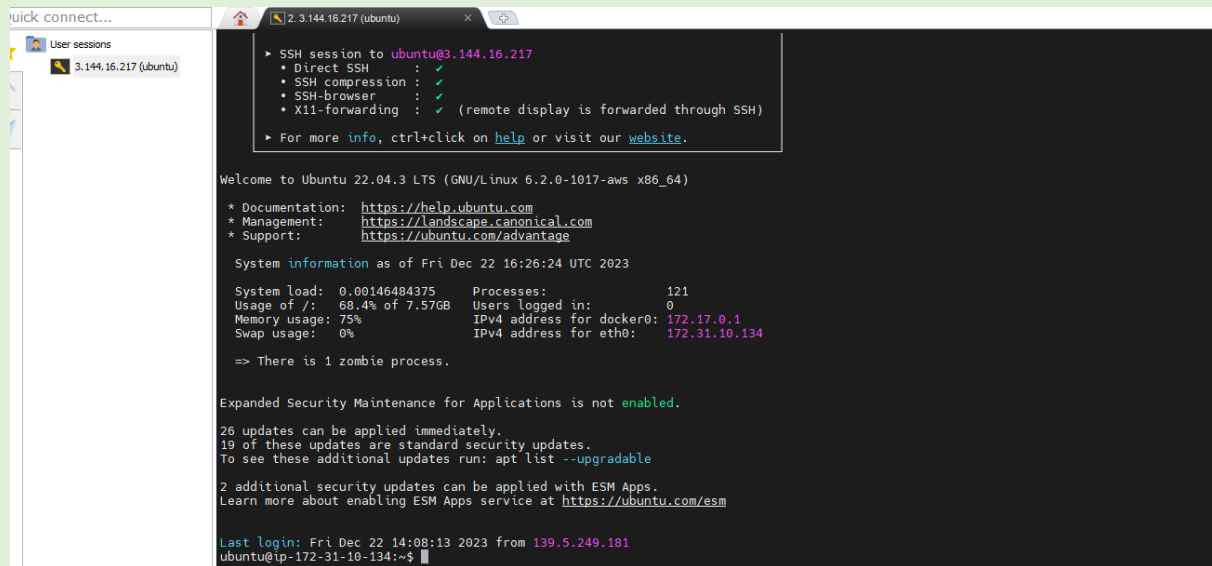


AWS:



By using the AWS EC2, instance is created and installed the Jenkins, SonarQube, Nexus, and Tomcat and Docker in single server.

SERVER CONECTIONS:



```
quick connect...
User sessions
3.144.16.217 (ubuntu)

SSH session to ubuntu03.144.16.217
• Direct SSH : ✓
• SSH compression : ✓
• SSH-browser : ✓
• X11-forwarding : ✓ (remote display is forwarded through SSH)
• For more info, ctrl+click on help or visit our website.

Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-1017-aws x86_64)

* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/advantage

System information as of Fri Dec 22 16:26:24 UTC 2023

System load: 0.00146484375 Processes: 121
Usage of /: 68.4% of 7.57GB Users logged in: 0
Memory usage: 75% IPv4 address for docker0: 172.17.0.1
Swap usage: 0% IPv4 address for eth0: 172.31.10.134

=> There is 1 zombie process.

Expanded Security Maintenance for Applications is not enabled.

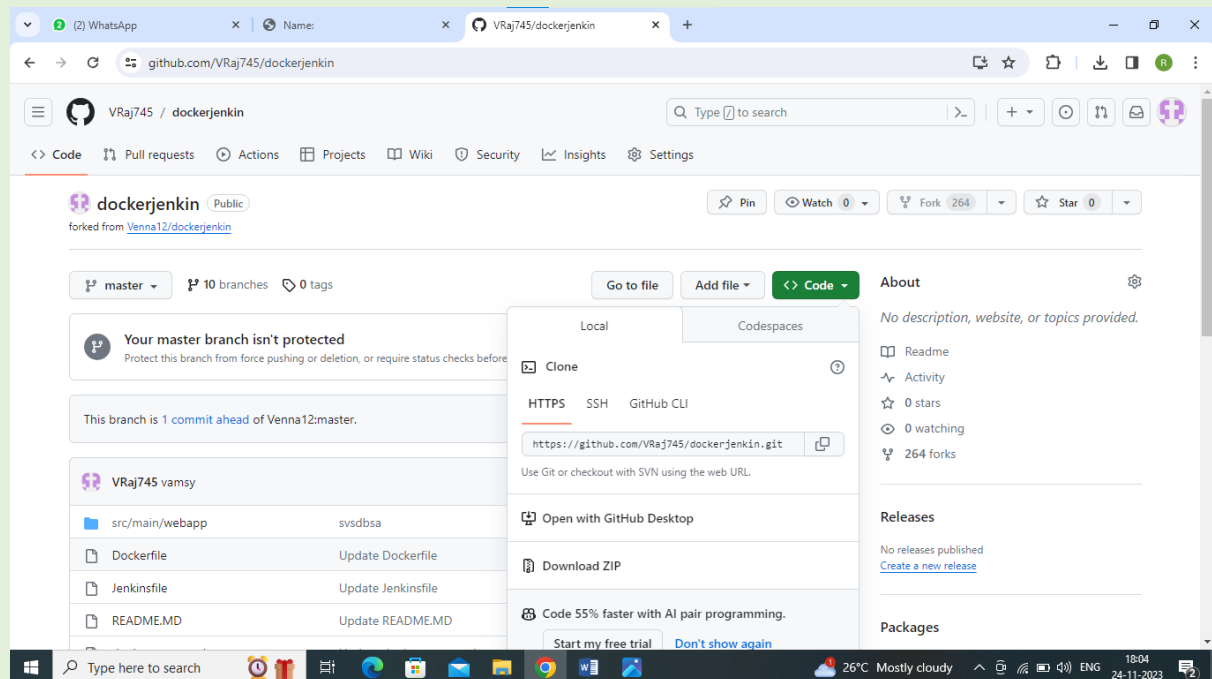
26 updates can be applied immediately.
19 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

2 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

Last login: Fri Dec 22 14:08:13 2023 from 139.5.249.181
ubuntu@ip-172-31-10-134:~$
```

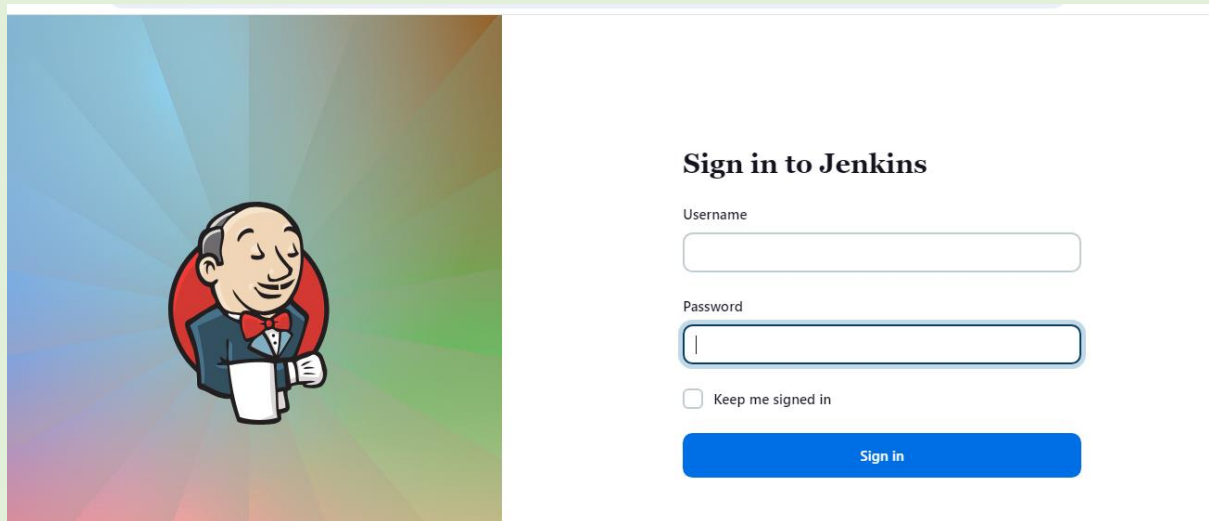
Above fig shows that the connection of instance in mobaxterm, which is used to install the jenkins, tomcat and required packages and more.

GITHUB:



Above fig shows that the git repository that which is used to deploy the webapp in the tomcat server. It is forked by the <https://github.com/Venna12/dockerjenkin.git>.

JENKINS:

The image shows the Jenkins sign-in page. On the left is a cartoon illustration of a man in a tuxedo holding a white envelope. On the right, the heading "Sign in to Jenkins" is followed by a "Username" field, a "Password" field, a "Keep me signed in" checkbox, and a blue "Sign in" button.

Sign in to Jenkins

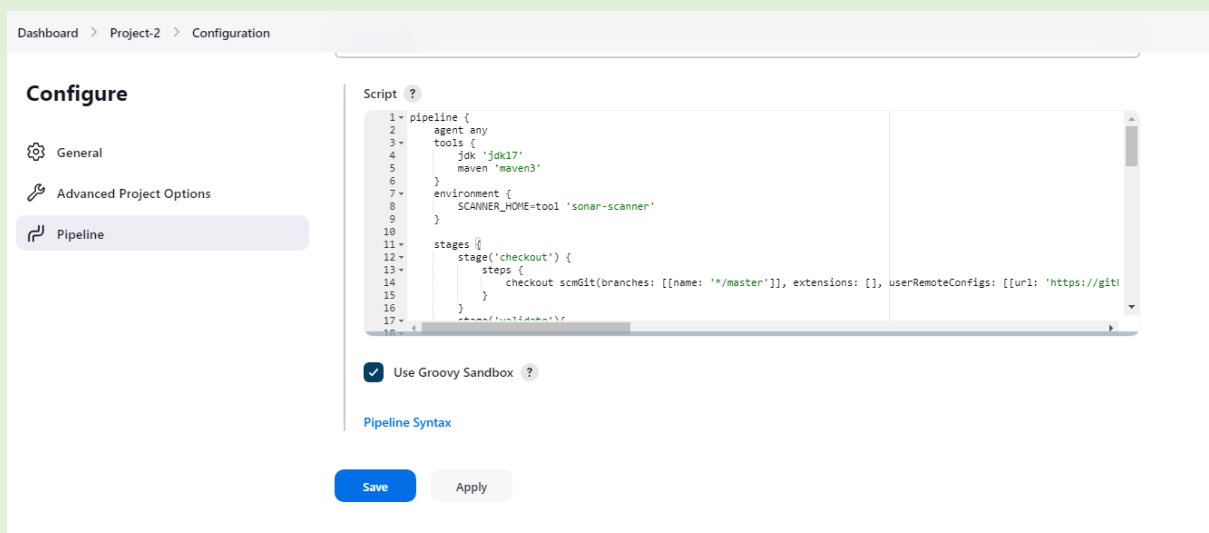
Username

Password

☐ Keep me signed in

Sign in

This is the Sign page for Jenkins.

The image shows the Jenkins Pipeline Configuration page. The breadcrumb trail is "Dashboard > Project-2 > Configuration". The left sidebar has "Configure" at the top, followed by "General", "Advanced Project Options", and "Pipeline" (which is selected). The main area is titled "Script" and contains a Groovy script for a pipeline. Below the script is a checkbox for "Use Groovy Sandbox" which is checked. At the bottom are "Save" and "Apply" buttons.

Dashboard > Project-2 > Configuration

Configure

General

Advanced Project Options

Pipeline

Script ?

```
1 pipeline {
2   agent any
3   tools {
4     jdk 'jdk17'
5     maven 'maven3'
6   }
7   environment {
8     SCANNER_HOME=tool 'sonar-scanner'
9   }
10
11   stages {
12     stage('checkout') {
13       steps {
14         checkout scmGit(branches: [[name: '*/master']], extensions: [], userRemoteConfigs: [[url: 'https://gitl
15       ]
16     }
17   }
18 }
```

☒ Use Groovy Sandbox ?

[Pipeline Syntax](#)

Save Apply

Above shows the pipeline job creation in the Jenkins.

Pipeline code:

```
pipeline {
  agent any
  tools {
    jdk 'jdk17'
    maven 'maven3'
  }
  environment {
```

```
    SCANNER_HOME=tool 'sonar-scanner'
}

stages {
    stage('checkout') {
        steps {
            checkout scmGit(branches: [[name: '*/master']], extensions: [],
userRemoteConfigs: [[url: 'https://github.com/VRaj745/dockerjenkin.git']])
        }
    }
    stage('validate'){
        steps{
            sh 'mvn validate '
        }
    }
    stage('compile'){
        steps{
            sh 'mvn compile'
        }
    }
    stage('test'){
        steps{
            sh 'mvn test'
        }
    }
    stage('build'){
        steps{
            sh 'mvn package'
        }
    }
    stage('Sonarqube'){
        steps{
```

```

        withSonarQubeEnv('sonar-server') {
            sh '''          $SCANNER_HOME/bin/sonar-scanner          -
Dsonar.projectName=dockerjenkins \
        -Dsonar.java.binaries=. \
        -Dsonar.projectKey=dockerjenkins '''
        }
    }
    stage('quality gate'){
        steps {
            script {
                waitForQualityGate abortPipeline: false, credentialsId: 'Sonar-
token'
            }
        }
    }
    stage('Nexus artifact'){
        steps{
            nexusArtifactUploader artifacts: [[artifactId: 'java-tomcat-maven-
example', classifier: '', file: '/var/lib/jenkins/workspace/Project-
2/target/java-tomcat-maven-example.war', type: 'war']], credentialsId:
'nexus123', groupId: 'com.example', nexusUrl: '13.59.143.13:8081',
nexusVersion: 'nexus3', protocol: 'http', repository: 'maven-snapshots',
version: '1.0-SNAPSHOT'
        }
    }
    stage('Deploy'){
        steps{
            deploy adapters: [tomcat9(credentialsId: '52c24633-b9e7-4df0-
b8aa-0fb09b4aa831', path: '', url: 'http://13.59.143.13:8086/)],
contextPath: 'PROJECT-3', war: '**/*.war'
        }
    }
    stage('Dp-Check'){
        steps{

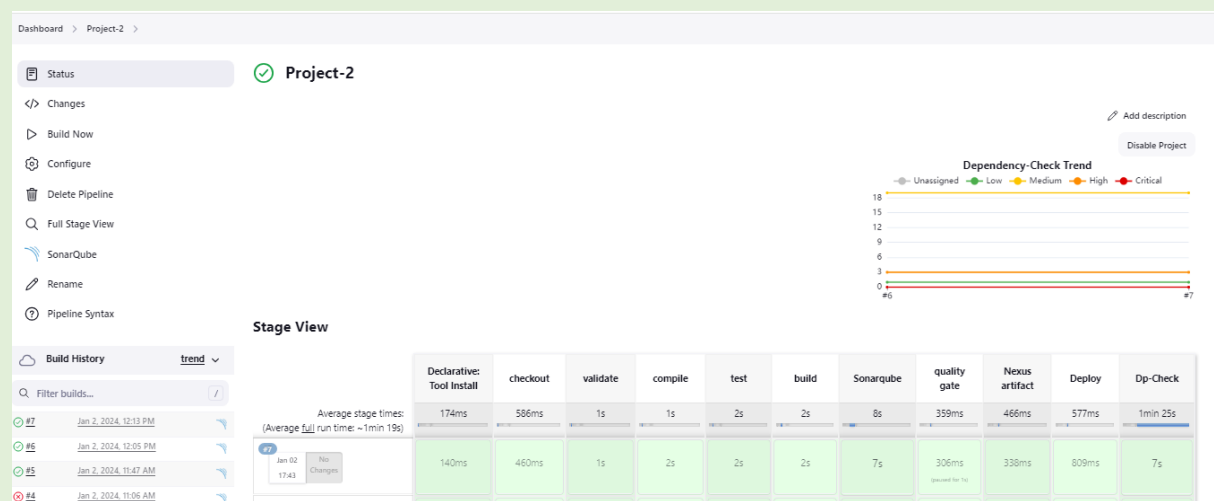
```

```

        dependencyCheck additionalArguments: '--scan ./ --format XML ',
        odcInstallation: 'Dp-Check'

        dependencyCheckPublisher pattern: '**/dependency-check-report.xml'
    }
}
}
}
}

```



This shows the creation and building the pipeline job and it shows the stage view.

The screenshot shows the Jenkins console output for 'assignment3 #3'. The output starts with 'Started by user Vanguri Raja Vamsy' and shows the pipeline stages: 'node', 'stage', and 'checkout'. The 'checkout' stage is currently running, and the output shows the git command being executed to fetch changes from the remote repository.

```

Started by user Vanguri Raja Vamsy
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/lib/jenkins/workspace/assignment3
[Pipeline] {
[Pipeline] stage
[Pipeline] { (checkout)
[Pipeline] checkout
The recommended git tool is: NONE
No credentials specified
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/assignment3/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/VRaj745/dockerjenkin.git # timeout=10
Fetching upstream changes from https://github.com/VRaj745/dockerjenkin.git
> git --version # timeout=10
> git --version # 'git version 2.34.1'
> git fetch --tags --force --progress -- https://github.com/VRaj745/dockerjenkin.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision be72c4be1aff1be210f97eeb1b10a0f4643b3ba0 (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f be72c4be1aff1be210f97eeb1b10a0f4643b3ba0 # timeout=10
Commit message: "Update README.md"
> git rev-list --no-walk be72c4be1aff1be210f97eeb1b10a0f4643b3ba0 # timeout=10

```

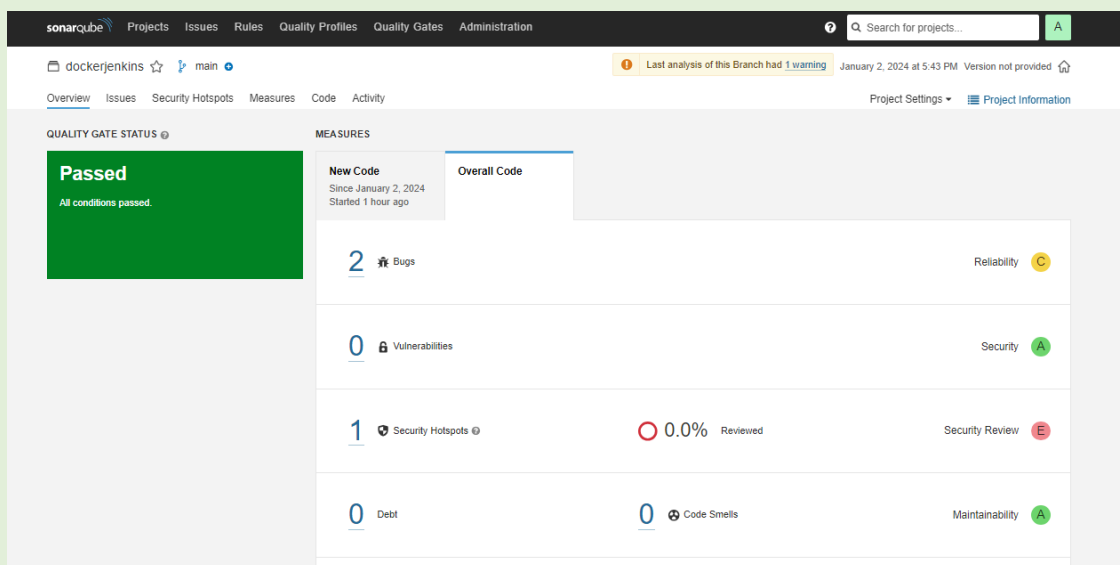
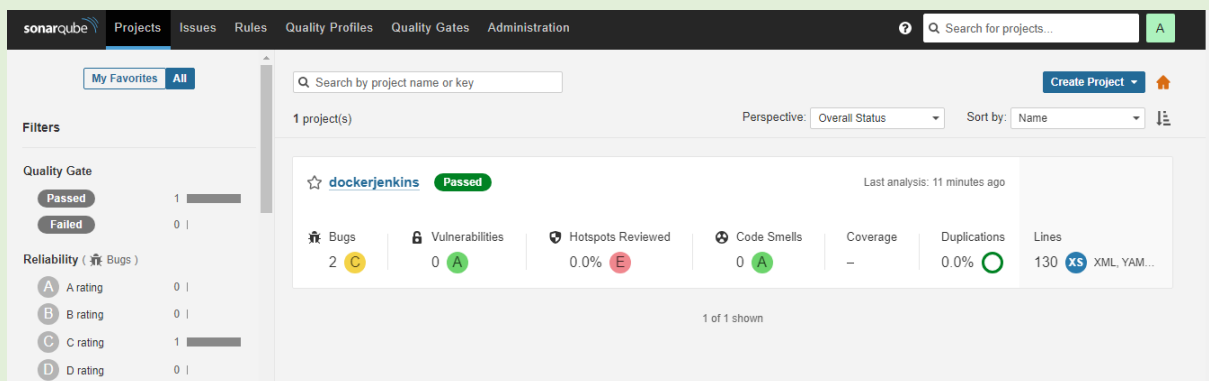
```
Dashboard > assignment3 > #3

Downloading: http://3.144.16.217:8081/repository/maven-snapshots/com/example/java-tomcat-maven-example/1.0-SNAPSHOT/maven-metadata.xml
100 % completed (609 B / 609 B).
Downloaded: http://3.144.16.217:8081/repository/maven-snapshots/com/example/java-tomcat-maven-example/1.0-SNAPSHOT/maven-metadata.xml (609 B at
2.6 kB/s)
Uploading: http://3.144.16.217:8081/repository/maven-snapshots/com/example/java-tomcat-maven-example/1.0-SNAPSHOT/java-tomcat-maven-example-1.0-
20231222.153603-2.war
Uploaded: http://3.144.16.217:8081/repository/maven-snapshots/com/example/java-tomcat-maven-example/1.0-SNAPSHOT/java-tomcat-maven-example-1.0-
20231222.153603-2.war (2.1 kB at 10 kB/s)
Uploading: http://3.144.16.217:8081/repository/maven-snapshots/com/example/java-tomcat-maven-example/1.0-SNAPSHOT/maven-metadata.xml
Uploaded: http://3.144.16.217:8081/repository/maven-snapshots/com/example/java-tomcat-maven-example/1.0-SNAPSHOT/maven-metadata.xml (609 B at 5.5
kB/s)
Uploading artifact java-tomcat-maven-example.war completed.
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Deploy)
[Pipeline] deploy
[DeployPublisher][INFO] Attempting to deploy 1 war file(s)
[DeployPublisher][INFO] Deploying /var/lib/jenkins/workspace/assignment3/target/java-tomcat-maven-example.war to container Tomcat 9.x Remote with
context assignment3
[/var/lib/jenkins/workspace/assignment3/target/java-tomcat-maven-example.war] is not deployed. Doing a fresh deployment.
Deploying [/var/lib/jenkins/workspace/assignment3/target/java-tomcat-maven-example.war]
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Above figures shows the **console output** of the pipeline job.

SONARQUBE:

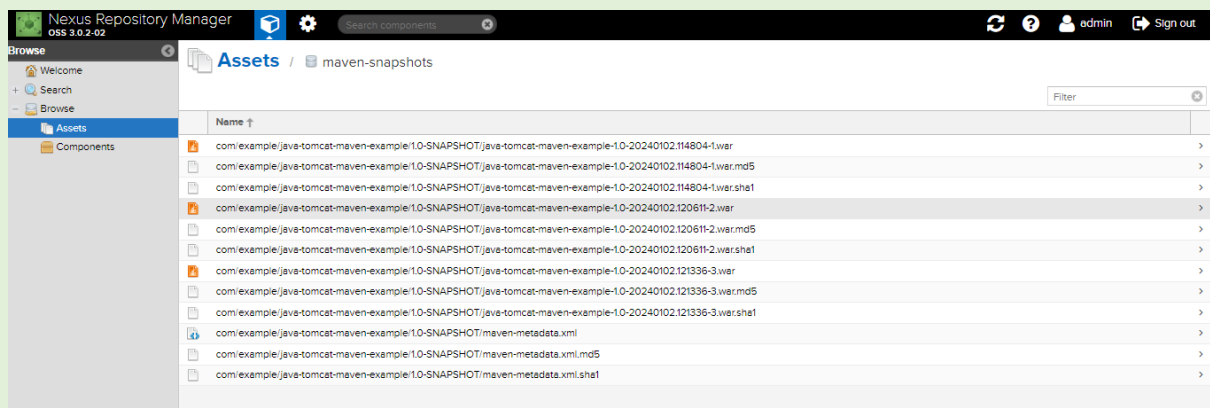
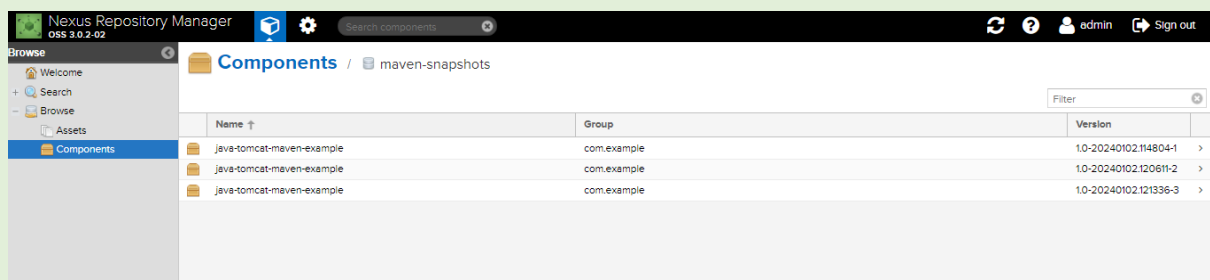
By using the sonarqube we done the code quality analysis. It says us about the details about code which shows the vulnerabilities, bugs etc.



The above fig shows that the Analysis of code.

NEXUS:

Nexus is a Sonatype Artifactory repository manager [OSS]. It allows you to store, distribute, and retrieve build artifacts whenever it's required. Using Nexus, developers can easily access and deploy build artifacts in an organization from a single location.



Above fig shows the nexus artifacts.

DP-CHECK:

Dependency-check is a utility that identifies project dependencies and checks if there are any known, publicly disclosed, vulnerabilities. This tool can be part of the solution to the OWASP top 10 2017: a9 - using components with known vulnerabilities.

Jenkins Search (CTRL+K) Vanguri Raja Vamsy log out

Dashboard > Project-2 > #7 > Dependency-Check

Dependency-Check Results

SEVERITY DISTRIBUTION

File Name	Vulnerability	Severity	Weakness
+ java-tomcat-maven-example.war	NVD CVE-2000-1210	Medium	NVD-CWE-Other
+ java-tomcat-maven-example.war	NVD CVE-2001-0590	Medium	NVD-CWE-Other
+ java-tomcat-maven-example.war	NVD CVE-2002-0493	High	CWE-254
+ java-tomcat-maven-example.war	NVD CVE-2005-4838	Medium	CWE-79
+ java-tomcat-maven-example.war	NVD CVE-2006-7196	Medium	CWE-79
+ java-tomcat-maven-example.war	NVD CVE-2007-1358	Low	CWE-79
+ java-tomcat-maven-example.war	NVD CVE-2007-2449	Medium	NVD-CWE-Other
+ java-tomcat-maven-example.war	NVD CVE-2008-0128	Medium	CWE-16
+ java-tomcat-maven-example.war	NVD CVE-2009-2696	Medium	CWE-79
+ java-tomcat-maven-example.war	NVD CVE-2013-2185	High	CWE-20

TOMCAT:

Instances | EC2 | us-east-1 | Apache Tomcat/9.0.83 | job2 [Jenkins] | Pipeline Syntax: Snippets | VRaj745/dockerjenkins | ChatGPT

Not secure 54.234.244.44:8080

Home Documentation Configuration Examples Wiki Mailing Lists Find Help

Apache Tomcat/9.0.83

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](#)

Developer Quick Start

- [Tomcat Setup](#)
- [Realms & AAA](#)
- [Examples](#)
- [Servlet Specifications](#)
- [First Web Application](#)
- [JDBC Data Sources](#)
- [Tomcat Versions](#)

Managing Tomcat

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

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

In Tomcat 9.0 access to the manager application is split between different users. [Read more...](#)

[Release Notes](#)
[Changelog](#)

Documentation

- [Tomcat 9.0 Documentation](#)
- [Tomcat 9.0 Configuration](#)
- [Tomcat Wiki](#)

Find additional important configuration information in:

```
$CATALINA_HOME/RUNNING.txt
```

Developers may be interested in:

[Tomcat 9.0 Beta Database](#)

Getting Help



FAQ and Mailing Lists

The following mailing lists are available:

- [tomcat-announce](#)
Important announcements, releases, security vulnerability notifications. (Low volume).
- [tomcat-users](#)
User support and discussion
- [tomcat-dev](#)
User support and discussion for Apache Tomcat

26°C Mostly cloudy 11:37 24-11-2023

Above fig shows that the open page of the TOMCAT server. By clicking on the manager app button, it takes us into the below view of the web page.

Tomcat Web Application Manager

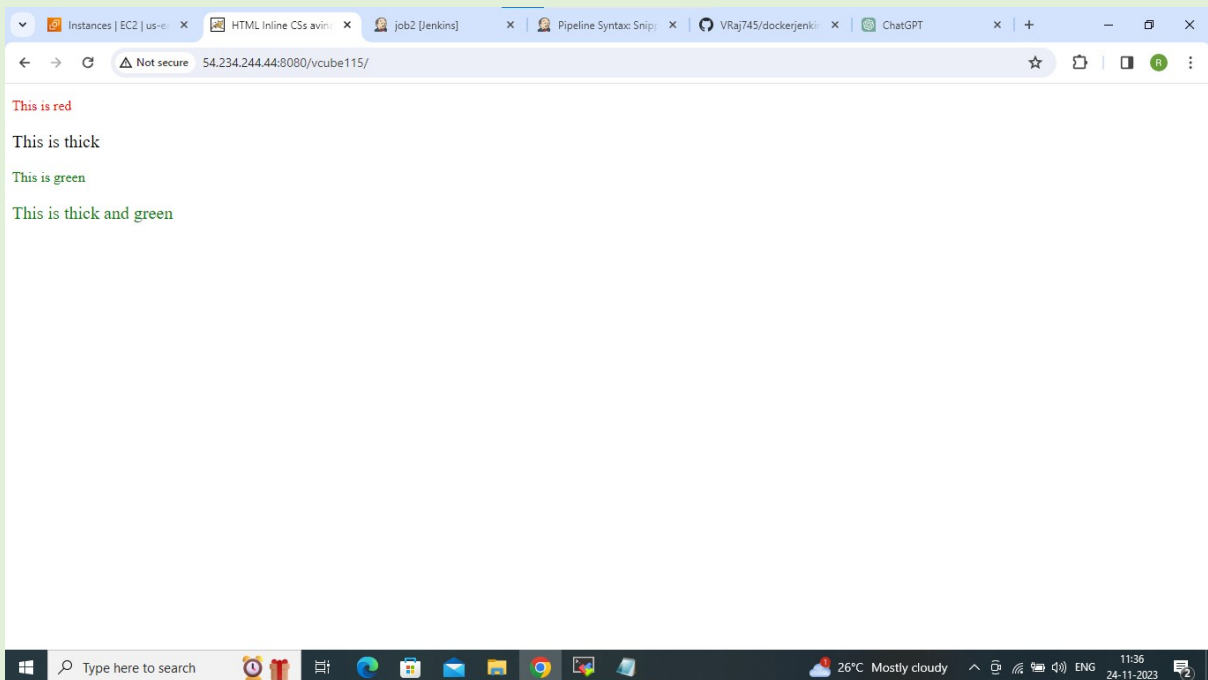
Message: OK

Manager

[List Applications](#)
[HTML Manager Help](#)
[Manager Help](#)
[Server Status](#)

Applications					
Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/PROJECT-3	None specified	Archetype Created Web Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/examples	None specified	Servlet and JSP Examples	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/host-manager	None specified	Tomcat Host Manager Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/manager	None specified	Tomcat Manager Application	true	1	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

In this page we can see the deployed webapp in the list as 'assignment'.



This is the Final output of the assignment.