Basic DevOps project:

Automation Deployment Project

Project Description:

- ⇨ This project involves writing a Jenkins pipeline to achieve continuous integration (CI) by getting the source code from GitHub, building the code using Maven, and storing artifacts on Nexus. The pipeline also incorporates a rollback mechanism in case of build failure. Additionally, it scans the source code using SonarQube for bugs and code smells. Once the source code is validated, the web application is deployed on a Tomcat server.

Used Tools:

- ⇨ Git (source code management tool)
- ⇨ Github (Manages the source code repositories)
- ⇨ Maven (Used for build the source code)
- ⇨ Jenkins (CI/CD pipeline)
- ⇨ Nexus (Artifact used for roll back to the previous version)
- ⇨ SonarQube (For identifying bugs in source code Code Quality test)
- ⇨ Tomcat (Application server

Procedure:

3 AWS instances/servers required.

1) Tomcat server
2) Nexus server
3) Jenkins & SonarQube server

- ⇨ Instance type for Jenkins & sonarQube server: T2. medium instance type
- ⇨ Instance type for Tomcat server: T2. micro instance type
- ⇨ Security group is need to accept all traffic

For Jenkins set-up:

Below script for the reference

```
yum install java-17-amazon-corretto -y

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

sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io-2023.key

yum install jenkins -y

systemctl start Jenkins
```

For SonarQube set-up:

Below script for the reference

```
cd /opt/

wget https://binaries.sonarsource.com/Distribution/sonarqube/sonarqube-8.9.6.50800.zip

unzip sonarqube-8.9.6.50800.zip

amazon-linux-extras install java-openjdk11 -y

useradd sonar

chown sonar:sonar sonarqube-8.9.6.50800 -R

chmod 777 sonarqube-8.9.6.50800 -R

su – sonar
```

For Tomcat setup:

Below script

amazon-linux-extras install java-openjdk11 -y

wget https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.96/bin/apache-tomcat-9.0.96.tar.gz

tar -zxvf apache-tomcat-9.0.96.tar.gz

sed -i '56 a\<role rolename="manager-gui"/>' apache-tomcat-9.0.96/conf/tomcat-users.xml

sed -i '57 a\<role rolename="manager-script"/>' apache-tomcat-9.0.96/conf/tomcat-users.xml

sed -i '58 a\<user username="tomcat" password="<enter-password>" roles="manager-gui, manager-script"/>' apache-tomcat-9.0.96/conf/tomcat-users.xml

sed -i '59 a\</tomcat-users>' apache-tomcat-9.0.96/conf/tomcat-users.xml

sed -i '56d' apache-tomcat-9.0.96/conf/tomcat-users.xml

sed -i '21d' apache-tomcat-9.0.96/webapps/manager/META-INF/context.xml

sed -i '22d' apache-tomcat-9.0.96/webapps/manager/META-INF/context.xml

sh apache-tomcat-9.0.96/bin/startup.sh

For Nexus Set-up:

Below script:

```
sudo chown -R nexus:nexus /app/nexus

sudo chown -R nexus:nexus /app/sonatype-work

sudo echo "run_as_user="nexus"" > /app/nexus/bin/nexus.rc

sudo tee /etc/systemd/system/nexus.service > /dev/null << EOL

[Unit]

Description=nexus service

After=network.target


[Service]

Type=forking

LimitNOFILE=65536

User=nexus

Group=nexus

ExecStart=/app/nexus/bin/nexus start

ExecStop=/app/nexus/bin/nexus stop

User=nexus

Restart=on-abort


[Install]

WantedBy=multi-user.target

EOL

sudo chkconfig nexus on

sudo systemctl start nexus

sudo systemctl status nexus
```

Pipeline syntax in Jenkins:

```
pipeline {
    agent any

    stages {
        stage('code') {
            steps {
                git "<github-URL>"
            }
        }
        stage ("Build") {
            steps {
                sh "mvn clean package"
            }
        }
        stage ("CQA Test") {
            steps {
                script{
                    withSonarQubeEnv('mysonar') {
                        def mavenHome = tool name:"maven" , type: "maven"
                        def mavenCMD ="${mavenHome}/bin/mvn"
                        sh "${mavenCMD} sonar:sonar"
                    }
                }
            }
        }
```

```
    stage ("Artifact") {
        steps {
            nexusArtifactUploader artifacts: [[artifactId: 'myweb', classifier: '', file: 'target/myweb-8.6.7.war', type: 'war']], credentialsId: 'nexus', groupId: 'in.javahome', nexusUrl: '34.227.57.27:8081', nexusVersion: 'nexus3', protocol: 'http', repository: 'my-nexus-repo', version: '8.6.7'
        }
    }
    stage ("Deployment") {
        steps {
            deploy adapters: [tomcat9(credentialsId: 'tomcat', path: '', url: 'http://tomcat-URL')], contextPath: 'One', war: 'target/*.war'
        }
    }
  }
}
```

```
pipeline {
    agent any

    stages {
        stage('code') {
            steps {
                git "https://github.com/tigerkhedhar/one.git"
            }
        }
        stage ("Build") {
            steps {
                sh "mvn clean package"
            }
        }
        stage ("CQA Test") {
            steps {
```

```
        }
        stage ("CQA Test") {
            steps {
                script{
                    withSonarQubeEnv('mysonar') {
                        def mavenHome = tool name:"maven" , type: "maven"
                        def mavenCMD ="${mavenHome}/bin/mvn"
                        sh "${mavenCMD} sonar:sonar"
                    }
                }
            }
        }
        stage ("Artifact") {
            steps {
                nexusArtifactUploader artifacts: [[artifactId: 'myweb', classifier: '', file: 'target/myweb-8.6
            }
```

```
                }
            }
        }
        stage ("Artifact") {
            steps {
                nexusArtifactUploader artifacts: [[artifactId: 'myweb', classifier: '', file: 'target/myweb-8.6
            }
        }
        stage ("Deployment") {
            steps {
                deploy adapters: [tomcat9(credentialsId: 'tomcat', path: '', url: 'http://54.83.111.233:8080/')
            }
        }
    }
}
```

my-project-1

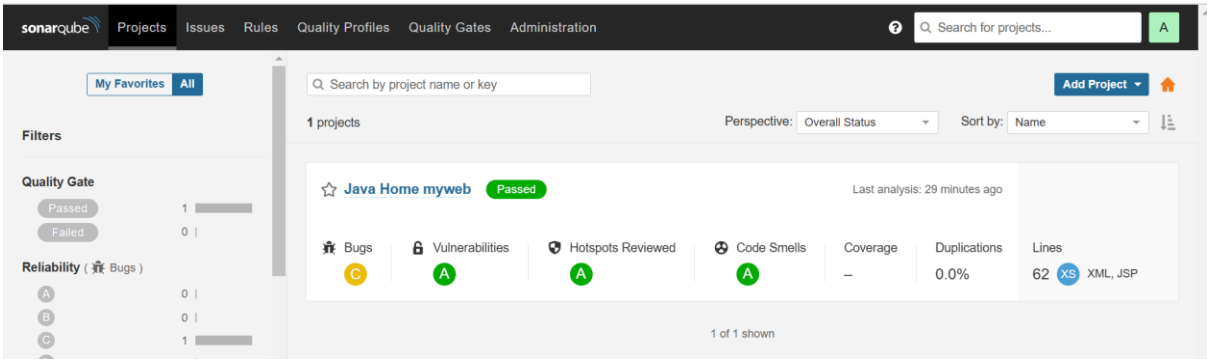
SonarQube Quality Gate

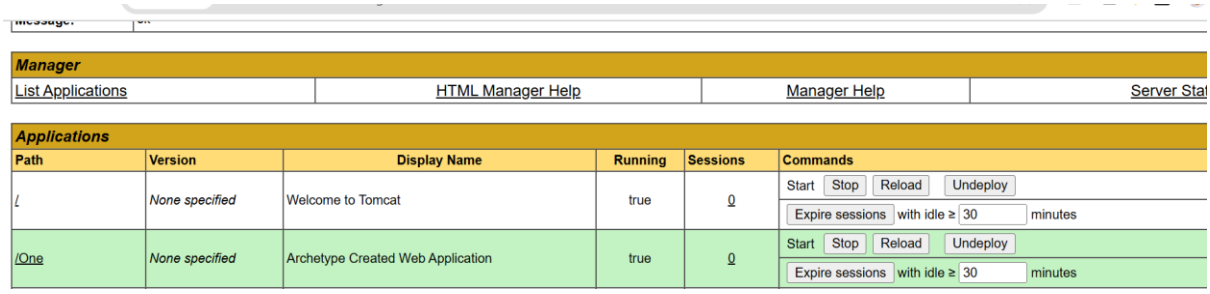
Java Home myweb **Passed**

server-side processing: **Success**

Permalinks

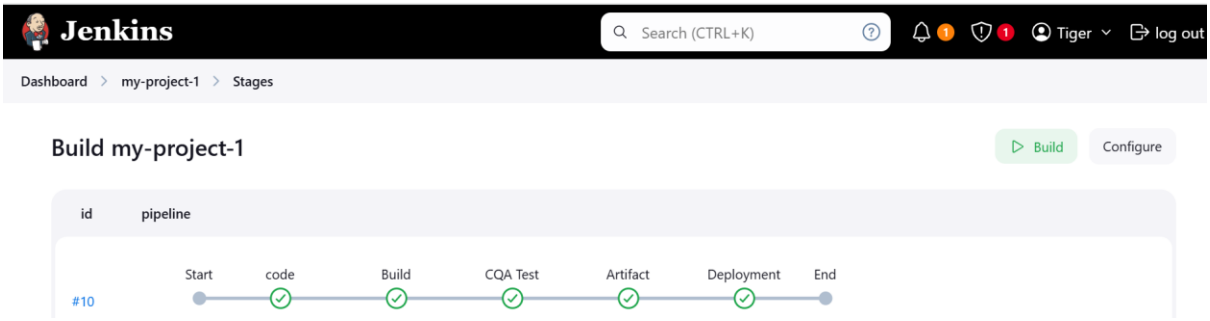
- Last build (#10), 27 min ago
- Last stable build (#10), 27 min ago
- Last successful build (#10), 27 min ago
- Last failed build (#7), 38 min ago
- Last unsuccessful build (#7), 38 min ago
- Last completed build (#10), 27 min ago





Manager			
List Applications	HTML Manager Help	Manager Help	Server Stat

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
/One	None specified	Archetype Created Web Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes


Jenkins
Search (CTRL+K)
Tiger
log out
Dashboard
my-project-1
Stages
Build my-project-1
Build
Configure
id
pipeline
Start
code
Build
CQA Test
Artifact
Deployment
End
#10