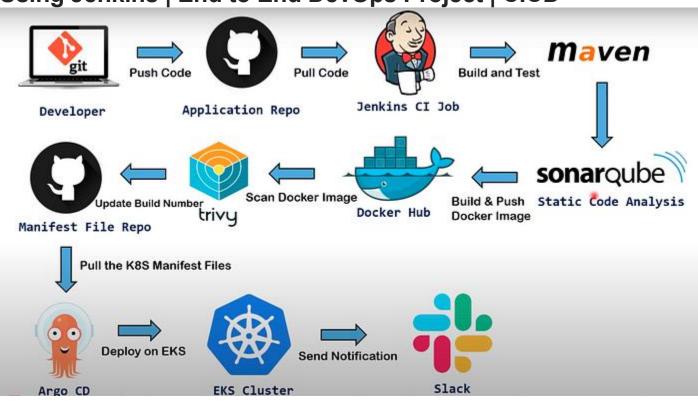
Deploy Register website

Real Time DevOps Project | Deploy to Kubernetes Using Jenkins | End to End DevOps Project | CICD



Step 1: Server 1- Jenkins-Master

Make one server.

Change the hostname IP address to name.

Once we update the name, we will reboot our system.

sudo init 6

Install Jenkins on your server, and as you know, Jenkins can not run without JAVA. So, JAVA installation is a must.

For installation, read my DevOps tools installation from the below link.

Jenkins Installation

Now you have to uncomment two lines in sshd_config, So write a command

sudo nano /etc/ssh/sshd_config

```
#LoginGracelime 2m
#PermitRootLogin prohibit-password
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10
PubkeyAuthentication yes
# Expect .ssh/authorized_keys2 to be disregarded by default in future.
AuthorizedKeysFile
                        .ssh/authorized_keys .ssh/authorized_keys2
#AuthorizedPrincipalsFile none
```

Reload service

sudo service sshd reload

Generate SSH key

ssh-keygen

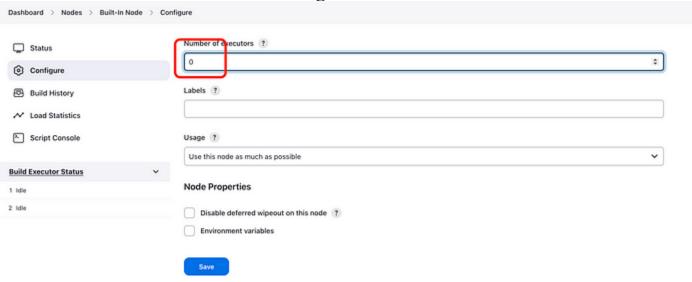
Copy the ssh pub key

```
/home/ubuntu
[ubuntu@Jenkins-Master:~$ cd .ssh/
ubuntu@Jenkins-Master:~/.ssh$ ls
authorized_keys id_rsa id_rsa.pub
[ubuntu@Jenkins-Master:~/.ssh$ cat id_rsa.pub
 ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQDRd4dZzufcklSQRtsrRgbWTMJe1cB4aVdUJ2PptH4ILrqHtS+r5FSD1q5vawd1
CMVk7uJEQZ/7Yi7LrIk3ts089mBuxmRMY+PoXf0nnSYkIinRR3cGd52aZoY7TBQs1Zt8Ilry7BgItsA54E/7ycYxA0nZyCcnQmSi
YdpcY2WQCq8FweJaOwWNhev2ypcuAFpIJQQmzTj7rs7F+JNEJ45L3dTvTvwNyv4GDfoVhIIN1GNxTVbIovwvDGn9aBvXUTfrOcQStrong and the property of the property o
P+zt9Fk6RwQs960BnUqcxN3Ds9/+hcwToSWSjFpXdrWhM1S1VTQueCNXNbYA6khKA7d8d6c0y/pTiiPsaDjCG3xcfBk6fWqQqQG
Exj/csr1goCBRpuFtqTKugqqyBnEWIiNebNh/Dj76Eil/YBZboE5JVVNFXI4be8u9lAHldbNglGUtbqnbxZ6/gidF2EinmgyAt2
iyB3ETv3HpTENEo/EYpw9Y/ktUmRQJPHUtH1Z0Bfc= ubuntu@Jenkins-Master
ubuntu@Jenkins-Master:~/.ssh$
```

Open Jenkins with server IP:8080

In Jenkins, open Dashboard > Manage Jenkins > Nodes

Under Node > Built in Node > Configure



Save and go to Dashboard again.

Dashboard > Manage Jenkins > Nodes > New node

New node

Node name

Jenkins-Agent

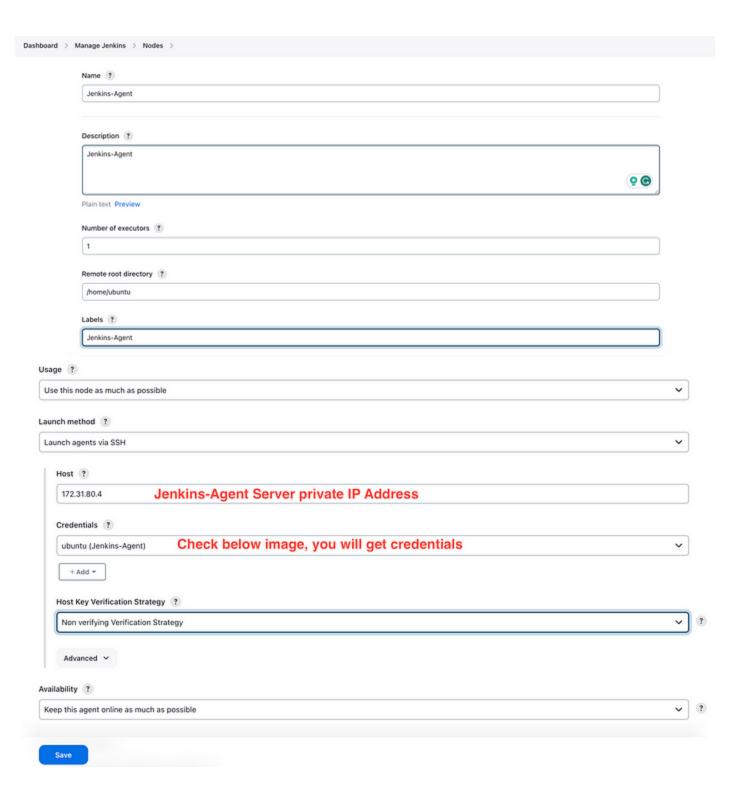
Type



Permanent Agent

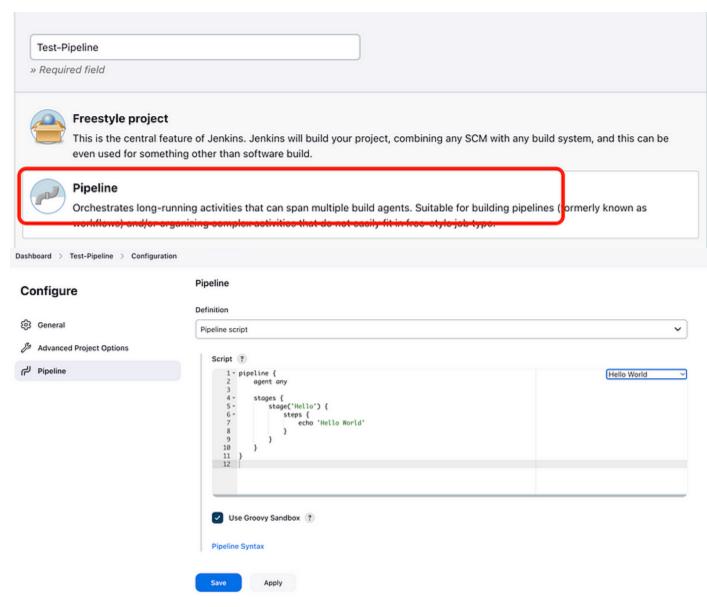
Adds a plain, permanent agent to Jenkins. This is called "permaner higher level of integration with these agents, such as dynamic provitypes apply — for example such as when you are adding a physical outside Jenkins, etc.

Create



Jenkins Credentials Provider: Jenkins **Add Credentials** Domain Global credentials (unrestricted) Kind SSH Username with private key Scope ? Global (Jenkins, nodes, items, all child items, etc) ID ? Jenkins-Agent Description ? Jenkins-Agent Username Username ubuntu Treat username as secret ? Private Key Enter directly Key Enter New Secret Below Add Jenkins-Master Private SSH key --BEGIN OPENSSH PRIVATE KEY-ō 😉 b3BlbnNzaC1rZKktdjEAAAAABG5vbmUAAAAEbm9uZQAAAAAAAAABAAABlwAAAAdzc2gtcn NhAAAAAwEAAOAAAYEA0XeHWc7n3JJUkEbbK0YG1kzCXtXAeGlXVCdi6bR+CC66h7Uvq+RU Passphrase Add Cancel

Start new pipeline



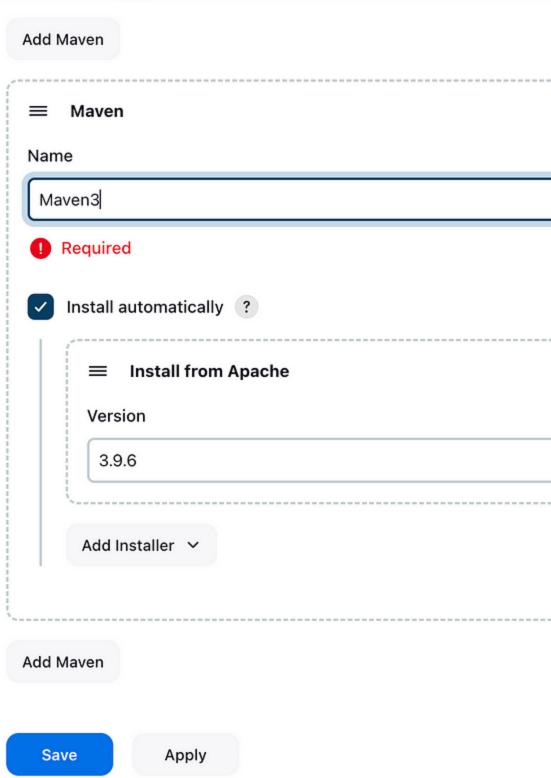
Test Jenkins

Build now.

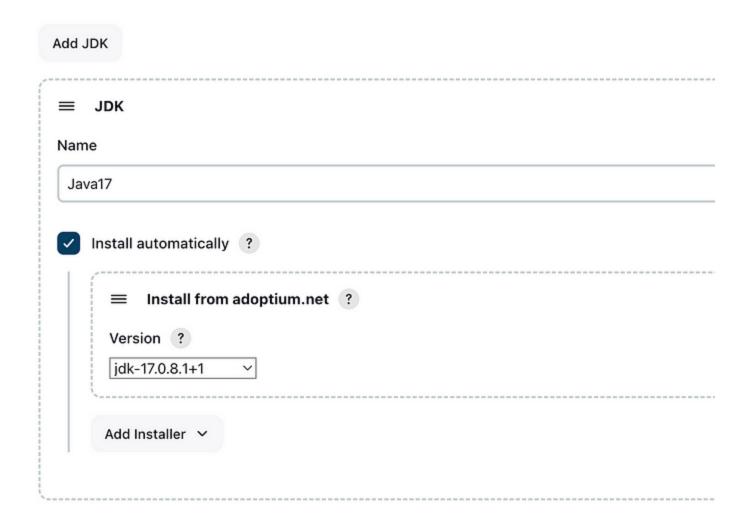
Dashboard > Manage Jenkins > Plugins

- -> Maven Integration in Jenkins.
- → Pipeline Maven Integration
- \rightarrow Eclipse Temurin Installer

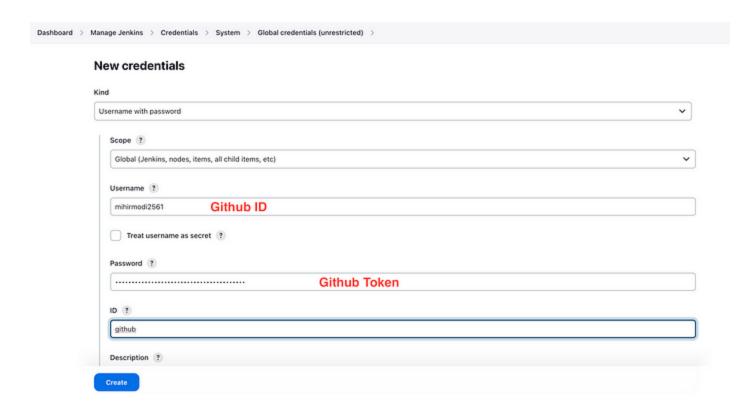
Dashboard > Manage Jenkins > Tools



JDK installations



Save and start add-in (git-hub)



Step 2: Server 2- Jenkins-Agent

Like Jenkins-Master, we must make another Jenkins-Agent server and change the **hostname**.

Install JAVA from DevOps tools installation \rightarrow **JAVA INSTALLATION**.

Install Docker from DevOps tools installation \rightarrow **Docker INSTALLATION**.

Give a rights docker to Jenkins-Agent user.

```
sudo usermod -aG docker $USER
```

Restart server:

```
sudo init 6
```

Now you have to uncomment two lines in sshd_config, So write a command

```
sudo nano /etc/ssh/sshd_config
```

```
#LoginGraceTime 2m

#PermitRootLogin prohibit-password

#StrictModes yes

#MaxAuthTries 6

#MaxSessions 10

PubkeyAuthentication yes

# Expect .ssh/authorized_keys2 to be disregarded by default in future.
AuthorizedKeysFile .ssh/authorized_keys .ssh/authorized_keys2

#AuthorizedPrincipalsFile none
```

Reload service

```
sudo service sshd reload
```

Paste the ssh pub key.

```
[ubuntu@Jenkins-Agent:~$ pwd
/home/ubuntu
[ubuntu@Jenkins-Agent: * cd .ssh/
[ubuntu@Jenkins-Agent:~/.ssh$ ls
authorized_keys
[ubuntu@Jenkins-Agent:~/.ssh$ nano authorized_keys
[ubuntu@Jenkins-Agent:~/.ssh$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQCSNcbvVWjiSTZfkf+pHY47dSnwD8ZxDdABA6NM/2eFzQID1rSATTNYaIvXr
zqTWt/nYvcdk7PVM/cbpgIZQmV4WmiC2dxt2LM4shR9S5kMeF5pzo03437ym/woAwAB498c7KfAhWXNdeDDpt5I0nm434jOss
HmKzZbPGiT1HmbP6UCR9pZXohj60TJLUnF81SHbqr5o1ReiqbJfDvdfoe7ONhhGsZuGHsm5trPYtVWqNFwY28Yli01x31PMBs
NuDuYiXhakkAT8BSMU1ISgYGzqwVD2bkrB/S1YTuc25fahWWjTJvxQ3+A4IKOWdlr0efW4tRyGh6wjBf publickeypair
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQDRd4dZzufcklSQRtsrRgbWTMJe1cB4aVdUJ2PptH4ILrqHtS+r5FSD1q5va
SmCMVk7uJEQZ/7Yi7LrIk3ts089mBuxmRMY+PoXf0nnSYkIinRR3cGd52aZoY7TBQs1Zt8Ilry7BgItsA54E/7ycYxA0nZyCc
SHdFYdpcY2WQCq8FweJaOwWNhev2ypcuAFpIJQQmzTj7rs7F+JNEJ45L3dTvTvwNyv4GDfoVhIIN1GNxTVbIovwvDGn9aBvXU
OcQSdiP+zt9Fk6RwQs960BnUqcxN3Ds9/+hcwToSWSjFpXdrWhM1S1VTQueCNXNbYA6khKA7d8d6c0y/pTiiPsaDjCG3xcfBk
qQqQGCLTExj/csr1goCBRpuFtqTKugqqyBnEWIiNebNh/Dj76Eil/YBZboE5JVVNFXI4be8u9lAHldbNglGUtbqnbxZ6/gidF
nmgyAt2NOoiyB3ETv3HpTENEo/EYpw9Y/ktUmRQJPHUtHlZ0Bfc= ubuntu@Jenkins-Master
ubuntu@Jenkins-Agent:~/.ssh$
```

Step: Create a Jenkins File in the GitHub repo.

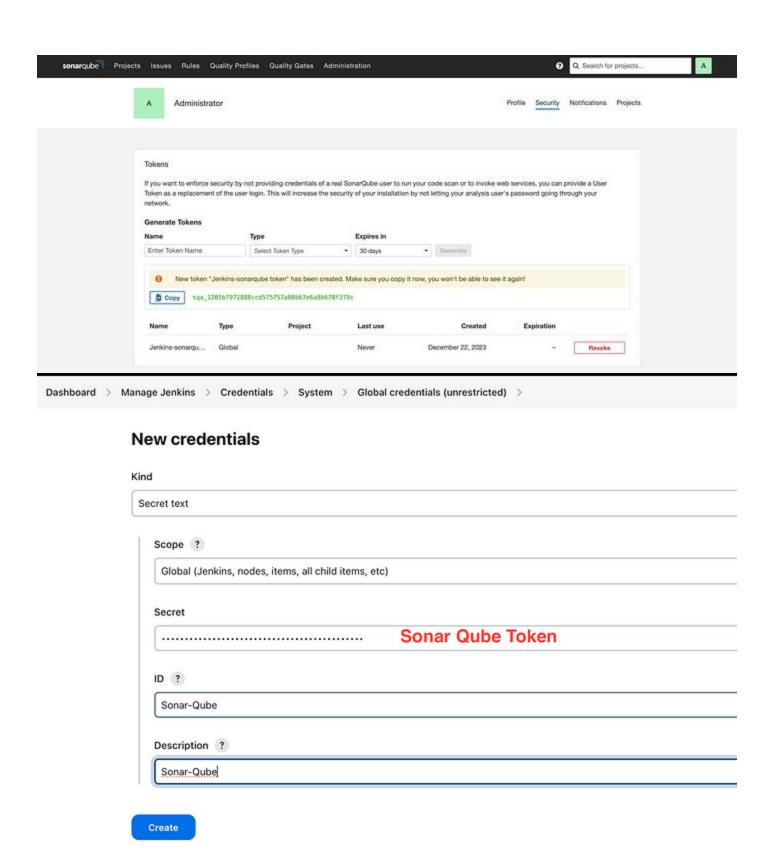
Github link:- https://github.com/mihirmodi2561/register-app

Step 4: New Server SONAR QUBE

SONAR QUBE INSTALLTION

Once you have installed Sonar Qube, start integrating with Jenkins.

My Account > Security > Generate Token

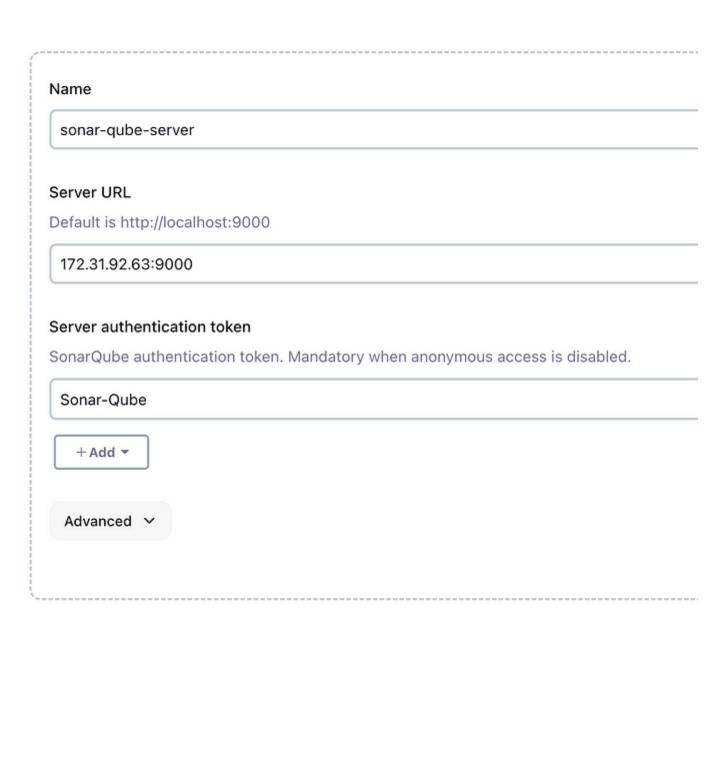


Add This 3 Plugin in Jenkins

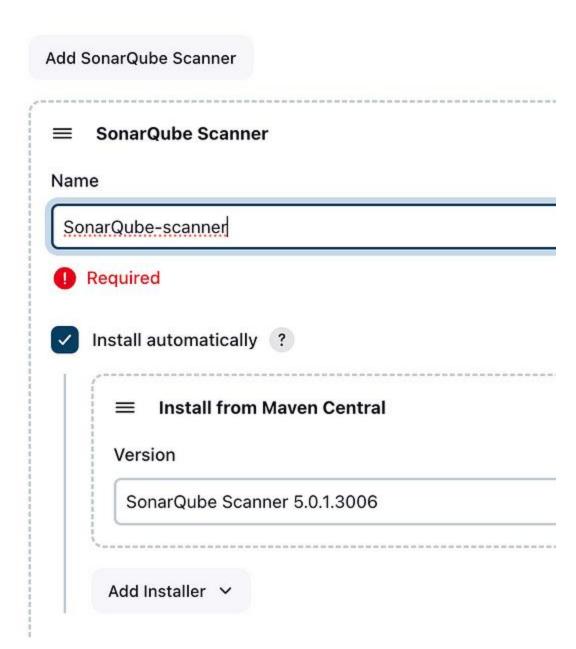
Install Name ↓ SonarQube Scanner 2.16.1 External Site/Tool Integrations Build Reports This plugin allows an easy integration of SonarQube, the open source platform code quality. Sonar Quality Gates 1.3.1 Fails the build whenever the Quality Gates criteria in the Sonar 5.6+ analysis ar Gates status is different than "Passed") Warning: This plugin version may not be safe to use. Please review the follow Credentials transmitted in plain text Quality Gates 2.5 Fails the build whenever the Quality Gates criteria in the Sonar analysis aren't r status is different than "Passed") Warning: This plugin version may not be safe to use. Please review the follow · Credentials transmitted in plain text

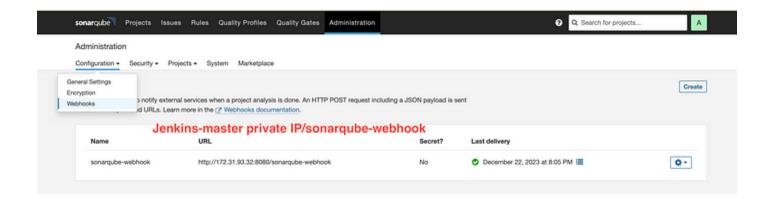
Once you installed, Now you have to set up in Jenkins system.

Manage Jenkins > system

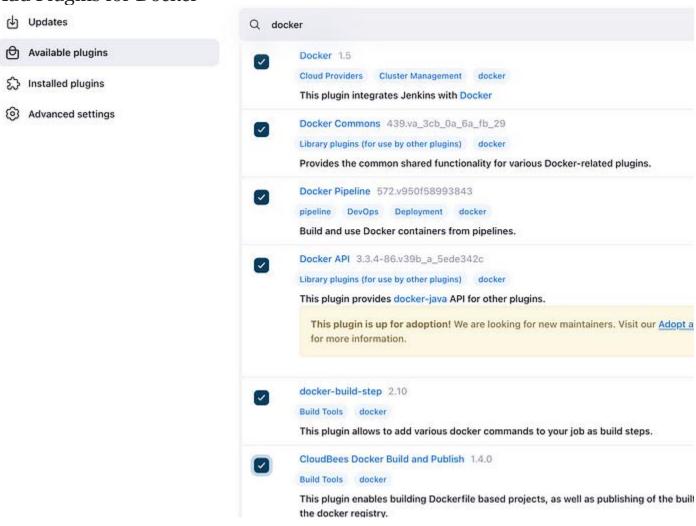


SonarQube Scanner installations





Add Plugins for Docker



Run Jenkins script

```
pipeline{
    agent { label 'Jenkins-Agent'}
    tools{
        jdk 'Java17'
        maven 'Maven3'
    environment{
            APP NAME = "register-app-ci"
            RELEASE = "1.0.0"
            DOCKER USER = "mihirmodi2561"
            DOCKER PASS = 'DockerHub'
            IMAGE \overline{NAME} = "\$\{DOCKER USER\}" + "/" + "\$\{APP NAME\}"
            IMAGE TAG = "${RELEASE}-${BUILD NUMBER}"
    stages{
        stage("Cleanup Worksapce"){
            steps{
                cleanWs()
        stage("Check out from SCM"){
            steps{
                git credentialsId: 'github', url:
'https://github.com/mihirmodi2561/Register-app-ci-cd'
        stage("Build Application"){
            steps{
                sh "mvn clean package"
        stage("Test Application"){
            steps{
                sh "mvn test"
        stage("SonarQube Analysis"){
            steps{
                script{
                     withSonarQubeEnv(credentialsId: 'Sonar-Qube') {
                     sh "mvn sonar:sonar"
        }
        stage("Quality check"){
            steps{
                script{
                     waitForQualityGate abortPipeline: false, credentialsId:
'Sonar-Qube'
```

```
stage("Build & Push Docker Image") {
            steps{
                script{
                    docker.withRegistry('', DOCKER PASS) {
                        docker image = docker.build "${IMAGE NAME}"
                    docker.withRegistry('', DOCKER PASS) {
                        docker image.push("${IMAGE TAG}")
                        docker_image.push('latest')
                }
            }
        stage("Trivy sacan"){
            steps{
                script{
                    sh(' docker run -v
/var/run/docker.sock:/var/run/docker.sock aquasec/trivy image
mihirmodi2561/register-app-ci:latest --no-progress --scanner vuln --exit-code
0 --severity HIGH, CRITICAL --format table')
        stage('Clean Artifacts'){
            steps{
                script{
                    sh "docker rmi ${IMAGE NAME}:${IMAGE TAG}"
                    sh "docker rmi ${IMAGE NAME}:latest"
            }
        }
   }
}
```

Setup Bootstrap EKS Server.

Install AWS Cli on the above EC2

```
sudo su
curl "https://awscli.amazonaws.com/awscli-exe-linux-x86_64.zip" -o
"awscliv2.zip"
apt install unzip, $ unzip awscliv2.zip
sudo ./aws/install
```

```
pip3 install --user awscli
sudo ln -s $HOME/.local/bin/aws /usr/bin/aws
aws --version
```

Installing kubectl

```
sudo su
curl -O https://s3.us-west-2.amazonaws.com/amazon-eks/1.27.1/2023-04-
19/bin/linux/amd64/kubectl
11 , $ chmod +x ./kubectl //Gave executable permisions
mv kubectl /bin //Because all our executable files are in /bin
kubectl version --output=yaml
```

Installing eksctl

```
curl --silent --location
"https://github.com/weaveworks/eksctl/releases/latest/download/eksctl_$(uname
-s)_amd64.tar.gz" | tar xz -C /tmp
cd /tmp
$ 11
$ sudo mv /tmp/eksctl /bin
$ eksctl version
```

Setup Kubernetes using eksctl

```
eksctl create cluster --name virtualtechbox-cluster \
--region ap-south-1 \
--node-type t2.small \
--nodes 3 \
```

check the node from below.

kubectl get nodes

Add IAM role to EKS-bootstrap

Add Permission of AdministratorAcess after creating the IAM Role, add the IAM role to the EKS-bootstrap server.

ArgoCD Installation on EKS Cluster and Add EKS Cluster to ArgoCD

First, create a namespace

kubectl create namespace argood

Next, let's apply the yaml configuration files for ArgoCd

kubectl apply -n argocd -f https://raw.githubusercontent.com/argoproj/argocd/stable/manifests/install.yaml

Now, we can view the pods created in the ArgoCD namespace.

kubectl get pods -n argocd

To interact with the API Server we need to deploy the CLI:

```
curl --silent --location -o /usr/local/bin/argocd
https://github.com/argoproj/argo-cd/releases/download/v2.4.7/argocd-linux-
amd64
chmod +x /usr/local/bin/argocd
```

Expose argocd-server

```
kubectl patch svc argocd-server -n argocd -p '{"spec": {"type":
"LoadBalancer"}}'
```

```
Nubuntu@EKS-Bootstrap:-$ kubectl cluster-info

Kubernetes control plane is running at https://A12CF1EE5466651D85C86A841000A882.gr7.ap-south-1.eks.amazonaws.com

CoreDNS is running at https://A12CF1EE5466651D85C86A841000AB82.gr7.ap-south-1.eks.amazonaws.com/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy
To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
[ubuntu@EKS-Bootstrap:-$ kubectl patch svc argocd-server -n argocd -p '{"spec": ("type": "LoadBalancer"))'
service/argocd-server patched
[ubuntu@EKS-Bootstrap:-$ kubectl get svc -n argocd
NAME TYPE CLUSTER-IP EXTERNAL-IP
AGE
argocd-applicationset-controller
0/TCP 61m
                                                               ClusterIP
                                                                                      10.100.46.221
                                                                                                                                                                                                                                  7080/TCP,888
argocd-dex-server
7/TCP,5558/TCP
                                                               ClusterIP
                                                                                      10.100.41.166
                                                                                                                                                                                                                                  5556/TCP,555
argood-metrics
                                                               ClusterIP
                                                                                      18.188.249.281 <none>
                                                                                                                                                                                                                                  8882/TCP
argood-notifications-controller-metrics ClusterIP 61m
                                                                                      10.100.81.182
                                                                                                                                                                                                                                  9881/TCP
                                                                                                               <none>
argood-redis
                                                               ClusterIP
                                                                                      10.100.203.68
                                                                                                                                                                                                                                  6379/TCP
argocd-repo-server
4/TCP 61m
                                                               ClusterIP
                                                                                      10.100.68.162
                                                                                                                                                                                                                                  8081/TCP,808
argocd-server
,443:32257/TCP 61m
argocd-server-metrics
                                                               LoadBalancer 10.100.83.124
                                                                                                               ad786358ac7274798b8bd9e42a458c46-1852836236.ap-south-1.elb.amazonaws.com
                                                                                                                                                                                                                                  80:32731/TCP
                                                               ClusterIP
                                                                                      10.100.179.25
                                                                                                                                                                                                                                  8883/TCP
```

Wait about 2 minutes for the LoadBalancer creation

```
kubectl get svc -n argocd
```

```
[ubuntu@EKS-Bootstrap:~$ kubectl get secret argocd-initial-admin-secret -n argocd -o yaml apiVersion: v1 data:
    password: aG5UNnZTY0FNZF1XR0VZNg== kind: Secret
metadata:
    creationTimestamp: "2023-12-25T01:50:47Z"
    name: argocd-initial-admin-secret
    namespace: argocd
    resourceVersion: "8075"
    uid: d1857854-6ea7-4a7f-a6ae-f424ee02d6f0
type: Opaque
[ubuntu@EKS-Bootstrap:~$ echo aG5UNnZTY0FNZF1XR0VZNg== | base64 --decode
hnT6vScAMdYWGEY6ubuntu@EKS-Bootstrap:~$
```

Get a password and decode it.

```
kubectl get secret argocd-initial-admin-secret -n argocd -o yaml
echo WXVpLUg2LWxoWjRkSHFmSA== | base64 --decode
```

login to ArgoCD from CLI

argocd cluster list

```
argood login ad786358ac7274798b0bd9e42a450c46-1852836236.ap-south-1.elb.amazonaws.com --username admin
```

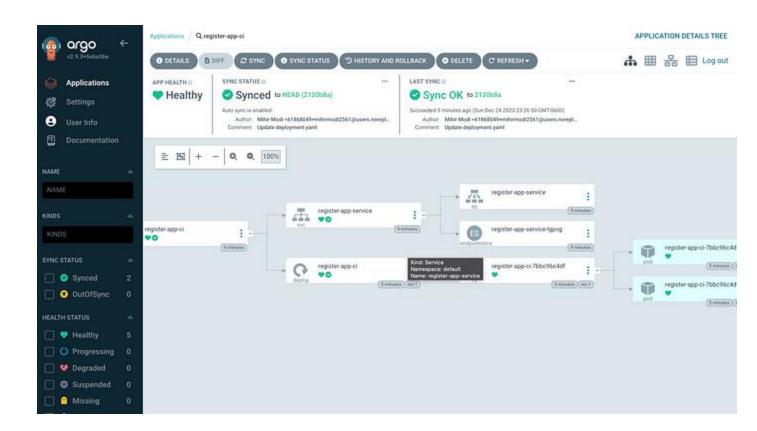
Below command will show the EKS cluster

kubectl config get-contexts

Add the above EKS cluster to ArgoCD with the below command



 $argo \rightarrow setting \rightarrow repositories \rightarrow connect \ repo \ with \ github \ repo$



argo application healthy.

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Enter Name	Enter Full Name	
Enter mobile	Enter moible numbe	r
Enter Email	Enter Email	
Password En	nter Password	
Repeat Passy	vord Repeat Passwo	ord

By creating an account you agree to our Terms & Privacy.

Register

Already have an account? Sign in.

Thank You

Website launched succesfully.

Thank you..