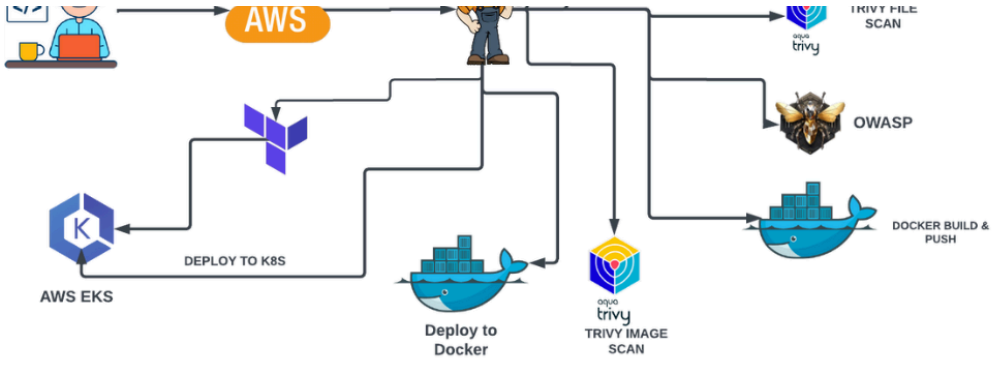
DevOps

DevSecOps CI/CD Pipeline for an Uber Clone

mrcloudbook.com · 29 December 2023



Welcome, tech enthusiasts! Today's journey is all about the cutting-edge realm of DevSecOps. Join us as we dive into deploying an Uber clone app using a comprehensive CI/CD approach. We'll explore the integration of SonarQube and OWASP for robust security measures, harness Docker Scout's power, and witness the orchestration of deployment onto an EKS cluster. This hands-on experience showcases Jenkins provisioning EKS via Terraform files, unlocking the seamless magic of DevSecOps in action.

GITHUB REPO: https://github.com/Aj7Ay/uber-clone.git

Step1: Launch an Ubuntu instance (T2.large)

1. **Sign in to AWS Console:** Log in to your AWS Management Console.
2. **Navigate to EC2 Dashboard:** Go to the EC2 Dashboard by selecting “Services” in the top menu and then choosing “EC2” under the Compute section.
3. **Launch Instance:** Click on the “Launch Instance” button to start the instance creation process.
4. **Choose an Amazon Machine Image (AMI):** Select an appropriate AMI for your instance. For example, you can choose Ubuntu image.
5. **Choose an Instance Type:** In the “Choose Instance Type” step, select `t2.large` as your instance type. Proceed by clicking “Next: Configure Instance Details.”
6. **Configure Instance Details:**
    - For “Number of Instances,” set it to 1 (unless you need multiple instances).
    - Configure additional settings like network, subnets, IAM role, etc., if necessary.
    - For “Storage,” click “Add New Volume” and set the size to 8GB (or modify the existing storage to 30GB).
    - Click “Next: Add Tags” when you’re done.
7. **Add Tags (Optional):** Add any desired tags to your instance. This step is optional, but it helps in organizing instances.
8. **Configure Security Group:**
    - Choose an existing security group or create a new one.
    - Ensure the security group has the necessary inbound/outbound rules to allow access as required.
9. **Review and Launch:** Review the configuration details. Ensure everything is set as desired.
10. **Select Key Pair:**

- Select “Choose an existing key pair” and choose the key pair from the drop down.
- Acknowledge that you have access to the selected private key file.
- Click “Launch Instances” to create the instance.

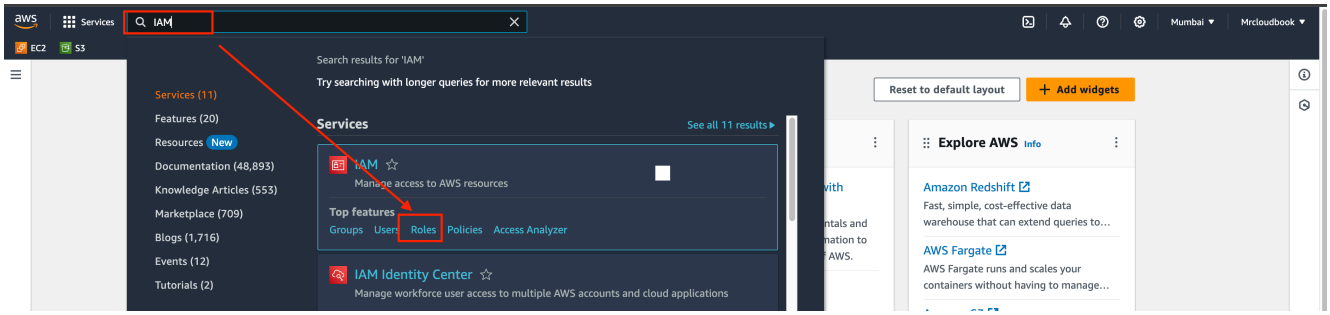
11. **Access the EC2 Instance:** Once the instance is launched, you can access it using the key pair and the instance’s public IP or DNS.

Ensure you have necessary permissions and follow best practices while configuring security groups and key pairs to maintain security for your EC2 instance.

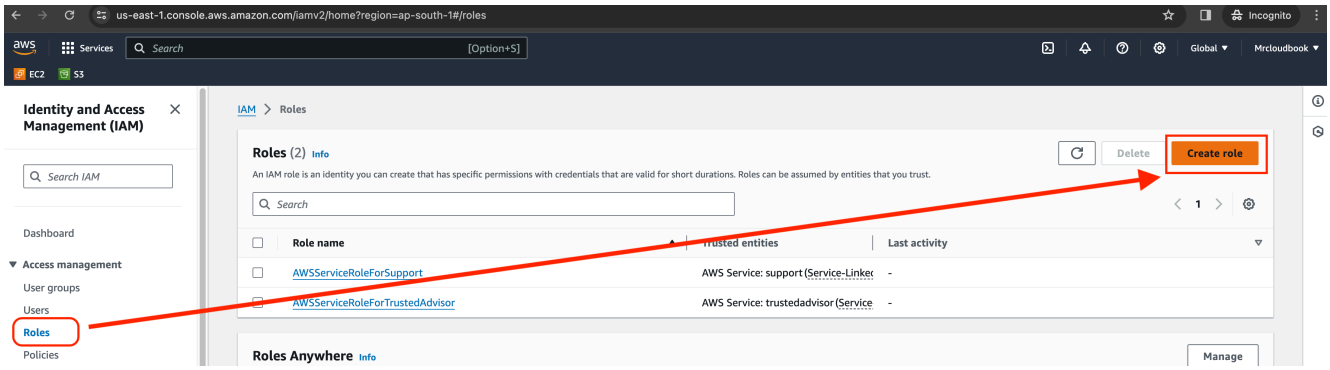
Contents [hide]

STEP 2: Create IAM role

Search for IAM in the search bar of AWS and click on roles.

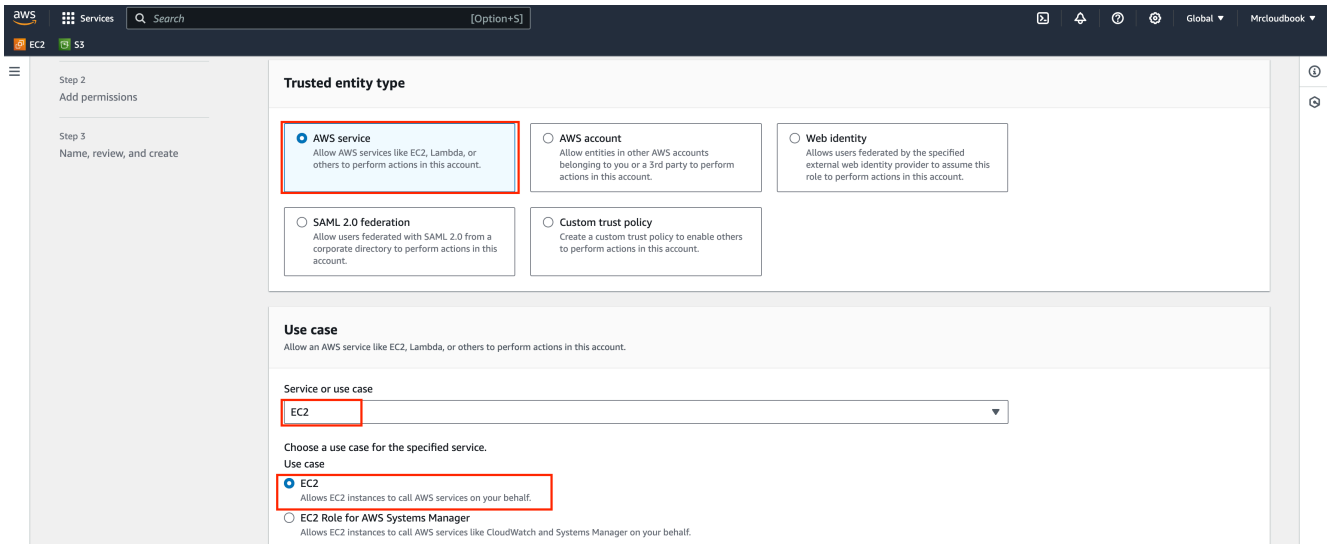


Click on Create Role

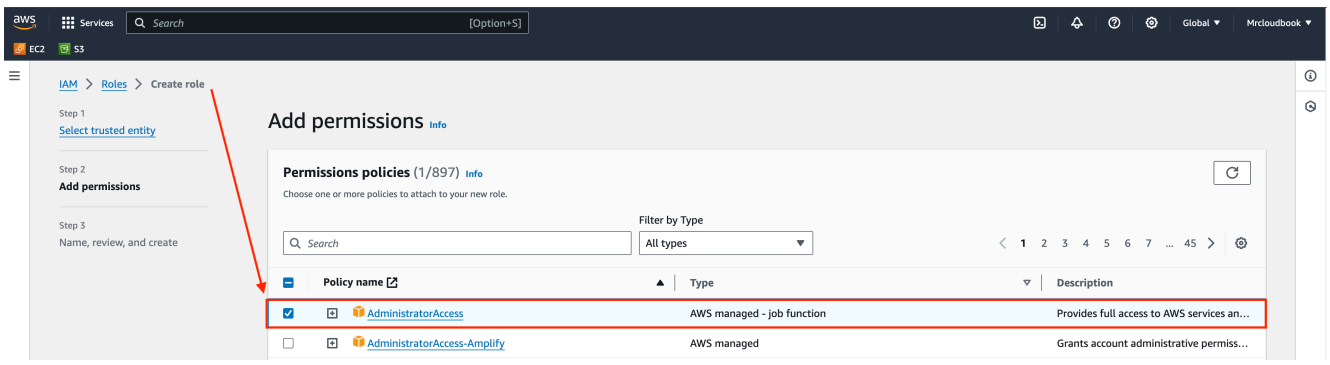


Select entity type as AWS service

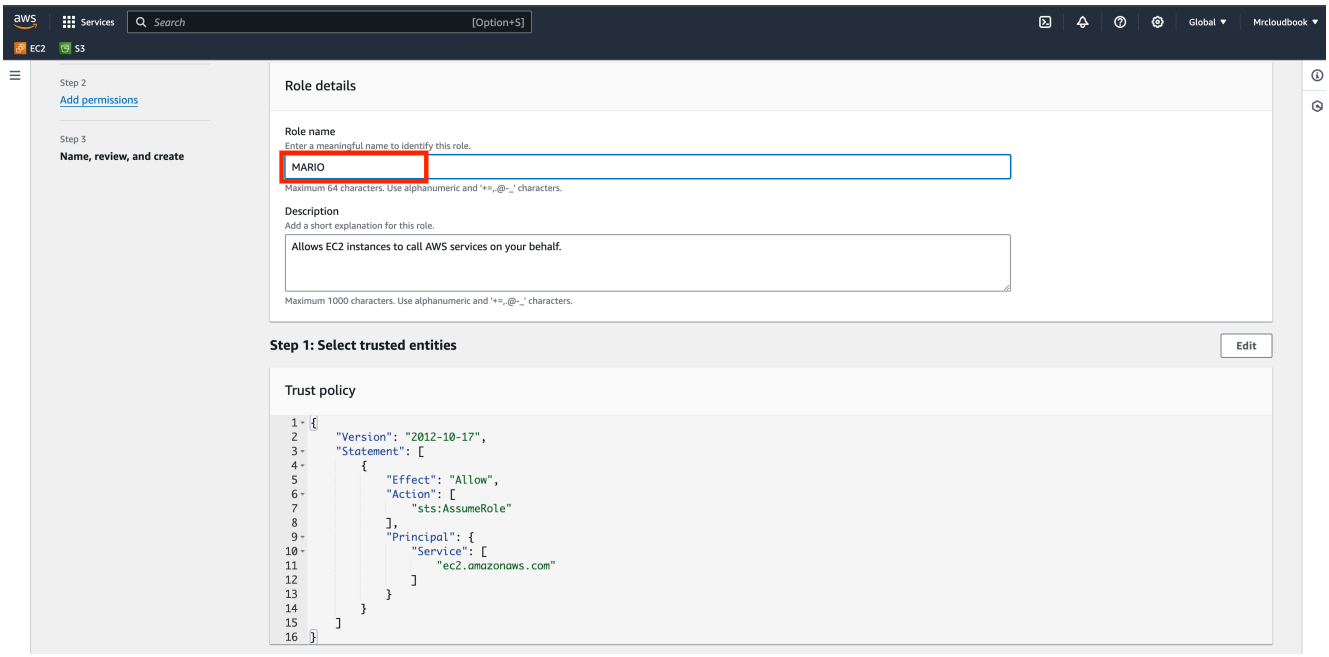
Use case as EC2 and click on Next.



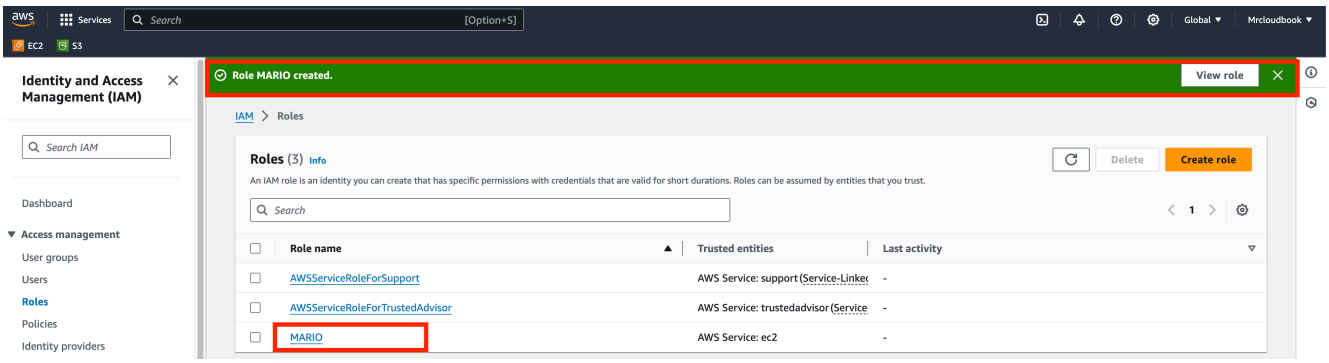
For permission policy select Administrator Access (Just for learning purpose), click Next.



Provide a Name for Role and click on Create role.



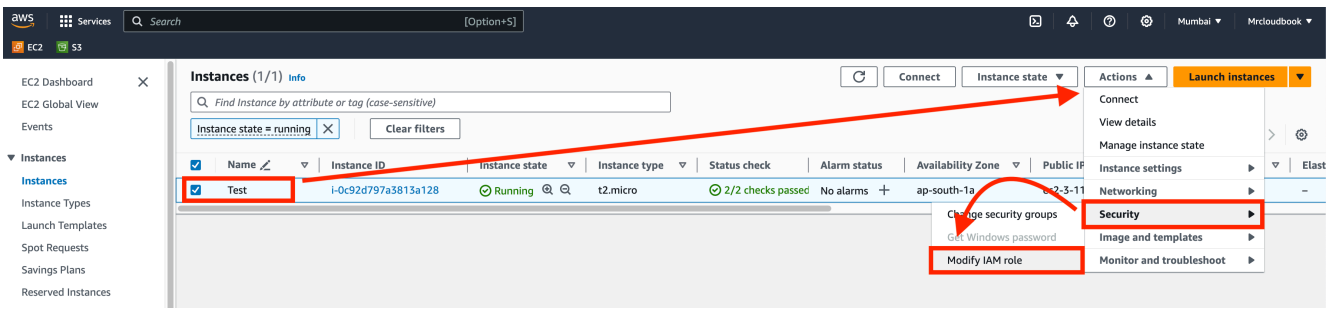
Role is created.



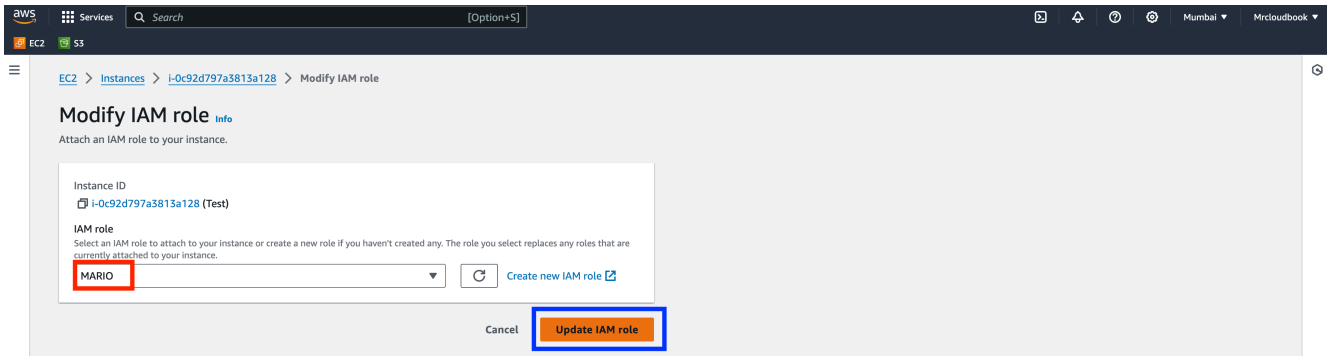
Now Attach this role to Ec2 instance that we created earlier, so we can provision cluster from that instance.

Go to EC2 Dashboard and select the instance.

Click on Actions –> Security –> Modify IAM role.



Select the Role that created earlier and click on Update IAM role.



Connect the instance to Mobaxtreme or Putty

Step3: Installations of Packages

create shell script in Ubuntu ec2 instance

```
sudo su   #run from inside root
vi script1.sh
```

Enter this script into it
This script installs Jenkins, Docker , Kubectl, Terraform, AWS Cli, Sonarqube

```
#!/bin/bash
sudo apt update -y
wget -O - https://packages.adoptium.net/artifactory/api/gpg/key/public
echo "deb [signed-by=/etc/apt/keyrings/adoptium.asc] https://packages.ad
sudo apt update -y
sudo apt install temurin-17-jdk -y
/usr/bin/java --version
curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key | su
echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] https://pkg
sudo apt-get update -y
sudo apt-get install jenkins -y
sudo systemctl start jenkins
#install docker
# Add Docker's official GPG key:
sudo apt-get update
```

```
sudo apt-get install ca-certificates curl gnupg -y
sudo install -m 0755 -d /etc/apt/keyrings
curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dea
sudo chmod a+r /etc/apt/keyrings/docker.gpg
# Add the repository to Apt sources:
echo \
  "deb [arch=$(dpkg --print-architecture) signed-by=/etc/apt/keyrings/do
  $(. /etc/os-release && echo "$VERSION_CODENAME") stable" | \
  sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
sudo apt-get update
sudo apt-get install docker-ce docker-ce-cli containerd.io docker-buildx
sudo usermod -aG docker ubuntu
newgrp docker
```

Now provide executable permissions to shell script

```
chmod 777 script1.sh
sh script1.sh
```

Let's Run the second script

```
vi script2.sh
```

Add this script

```
#!/bin/bash
# install trivy
sudo apt-get install wget apt-transport-https gnupg lsb-release -y
```

```
wget -qO - https://aquasecurity.github.io/trivy-repo/deb/public.key | gp
echo "deb [signed-by=/usr/share/keyrings/trivy.gpg] https://aquasecurity
sudo apt-get update
sudo apt-get install trivy -y
#install terraform
sudo apt install wget -y
wget -O- https://apt.releases.hashicorp.com/gpg | sudo gpg --dearmor -o
echo "deb [signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg]
sudo apt update && sudo apt install terraform
#install Kubectl on Jenkins
sudo apt update
sudo apt install curl -y
curl -LO https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/releas
sudo install -o root -g root -m 0755 kubectl /usr/local/bin/kubectl
kubectl version --client
#install Aws cli
curl "https://awscli.amazonaws.com/awscli-exe-linux-x86_64.zip" -o "awsc
sudo apt-get install unzip -y
unzip awscliv2.zip
sudo ./aws/install
```

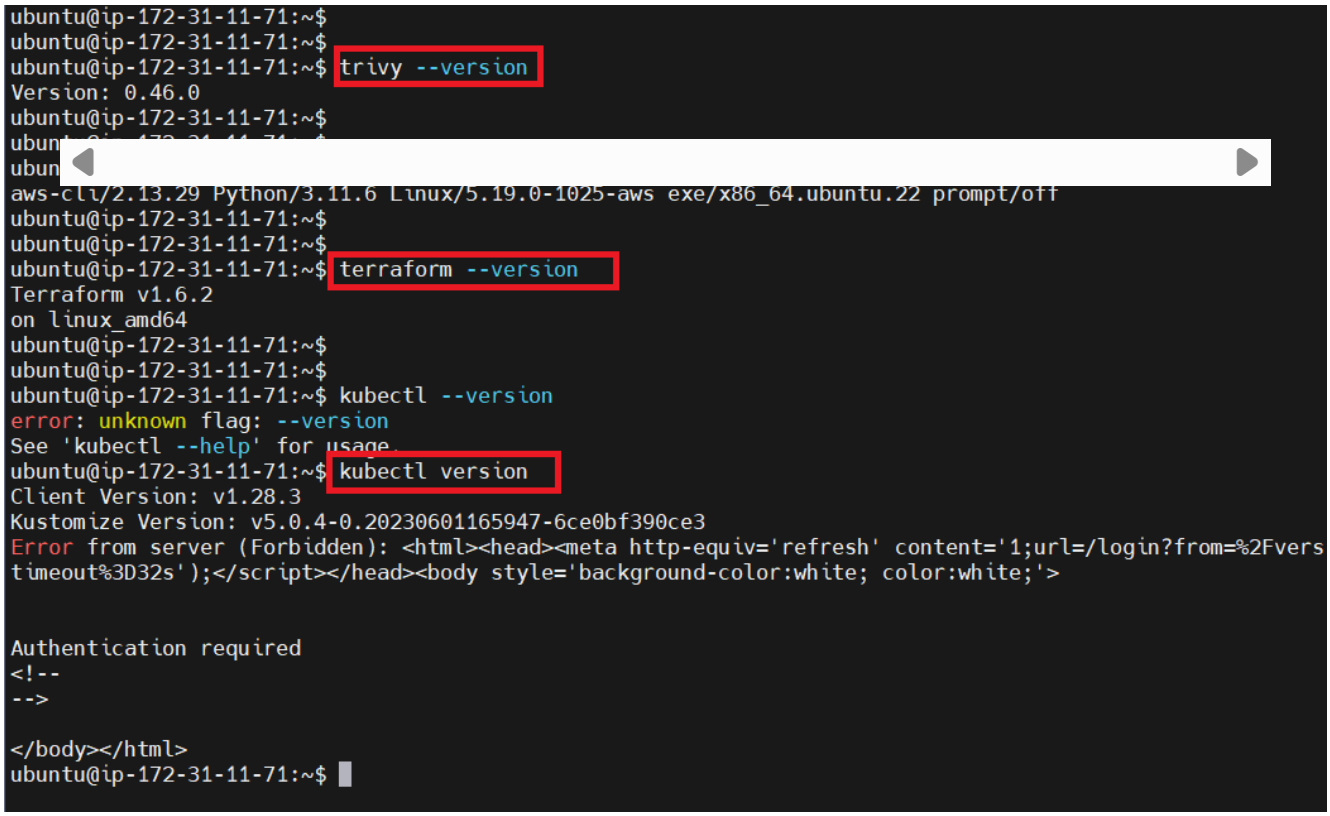
Now

```
chmod 777 script2.sh
sh script2.sh
```

Now check the versions of packages

```
docker --version
trivy --version
aws --version
```

```
terraform --version
kubectl version
```



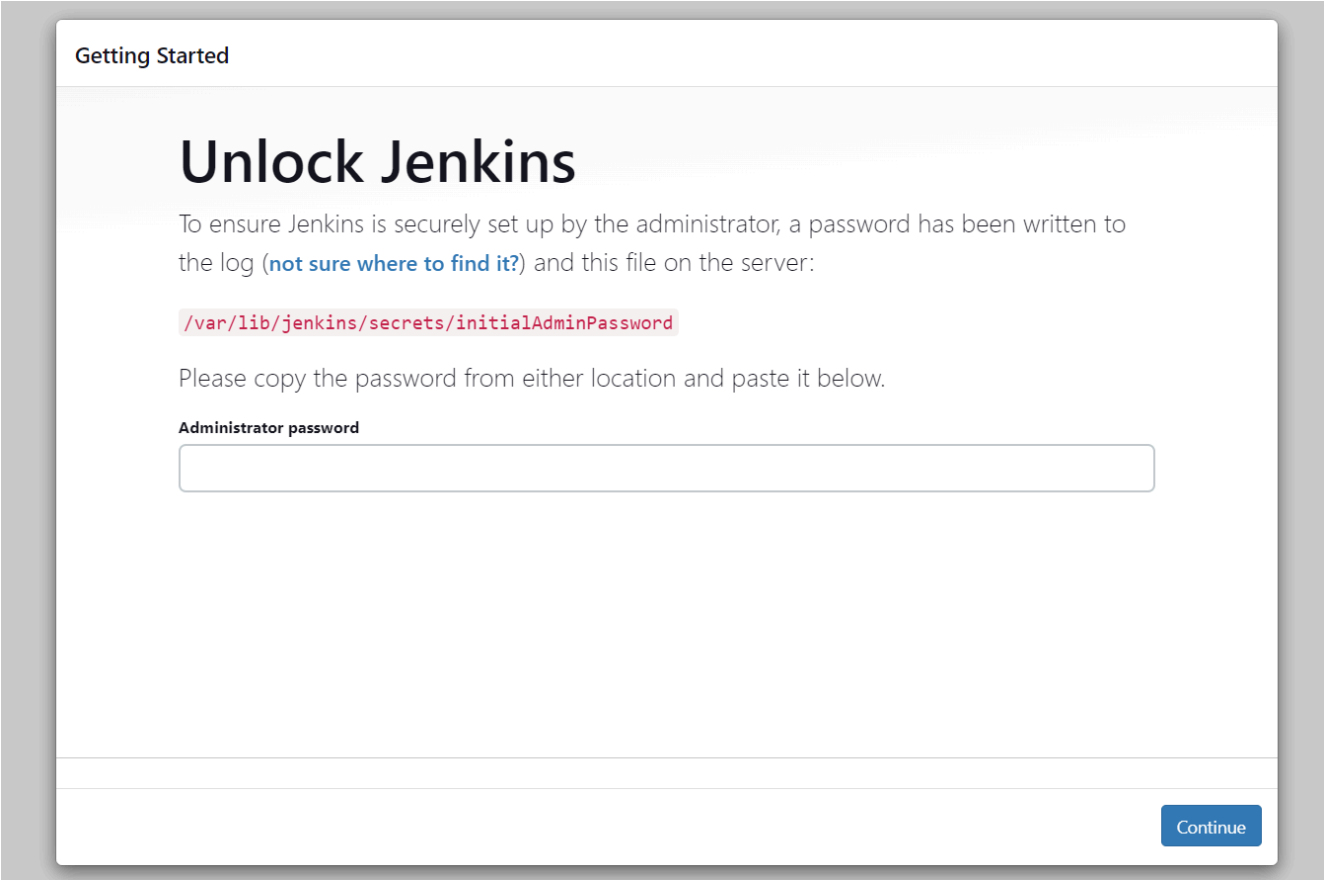
Provide executable permissions from Mobaxtreme

```
sudo chmod 777 /var/run/docker.sock
docker run -d --name sonar -p 9000:9000 sonarqube:lts-community
```

Step4: Connect to Jenkins and Sonarqube

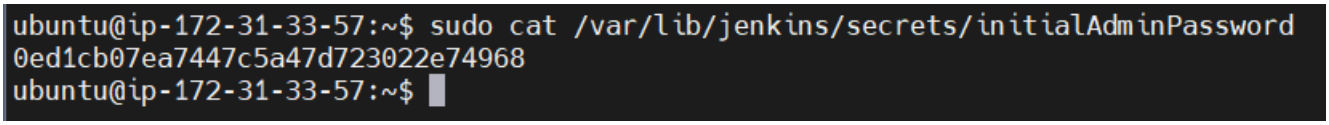
Now copy the public IP address of ec2 and paste it into the browser

```
<Ec2-ip:8080> #you will Jenkins login page
```

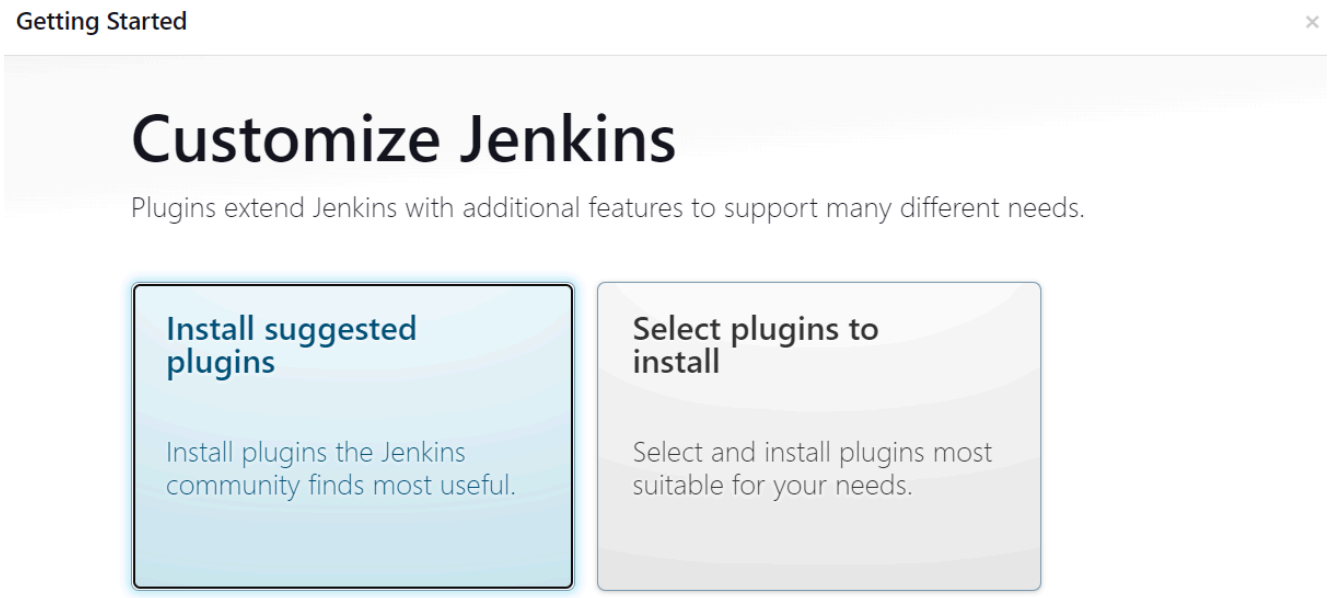


Connect your Instance to Putty or Mobaxtreme and provide the below command for the Administrator password

```
sudo cat /var/lib/jenkins/secrets/initialAdminPassword
```

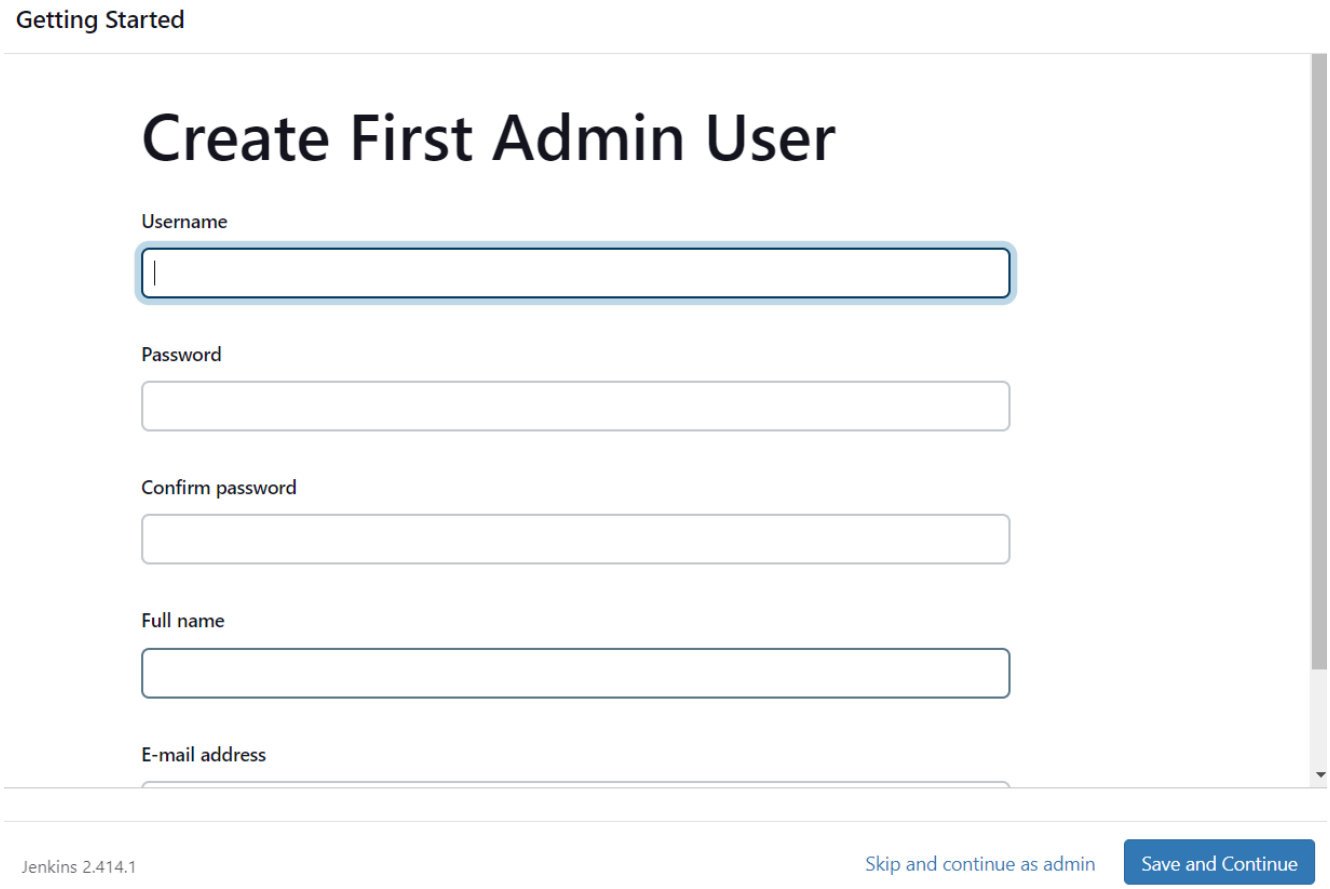


Now, install the suggested plugins.



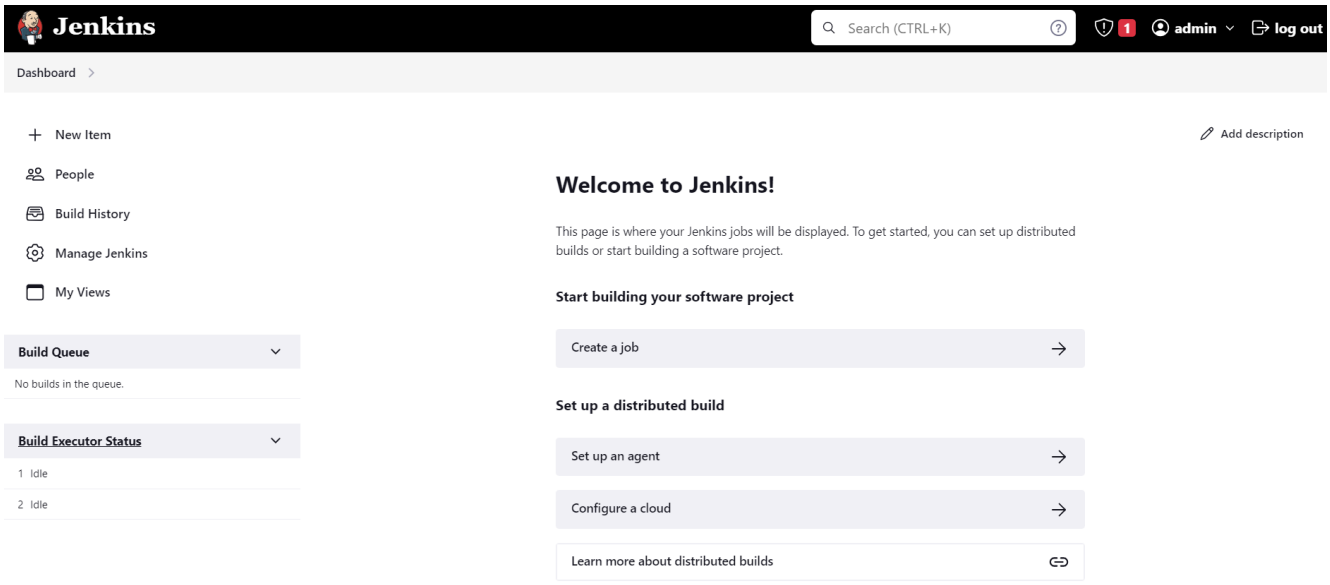
Jenkins will now get installed and install all the libraries.

Create an admin user



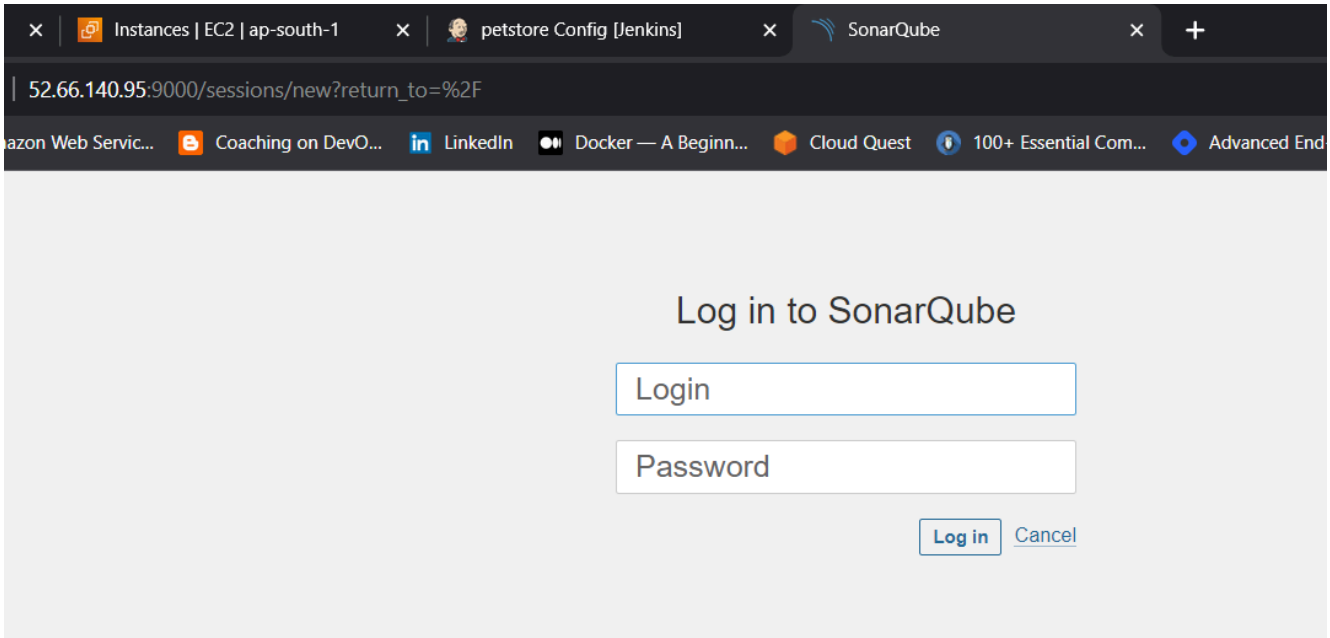
Click on save and continue.

Jenkins Dashboard



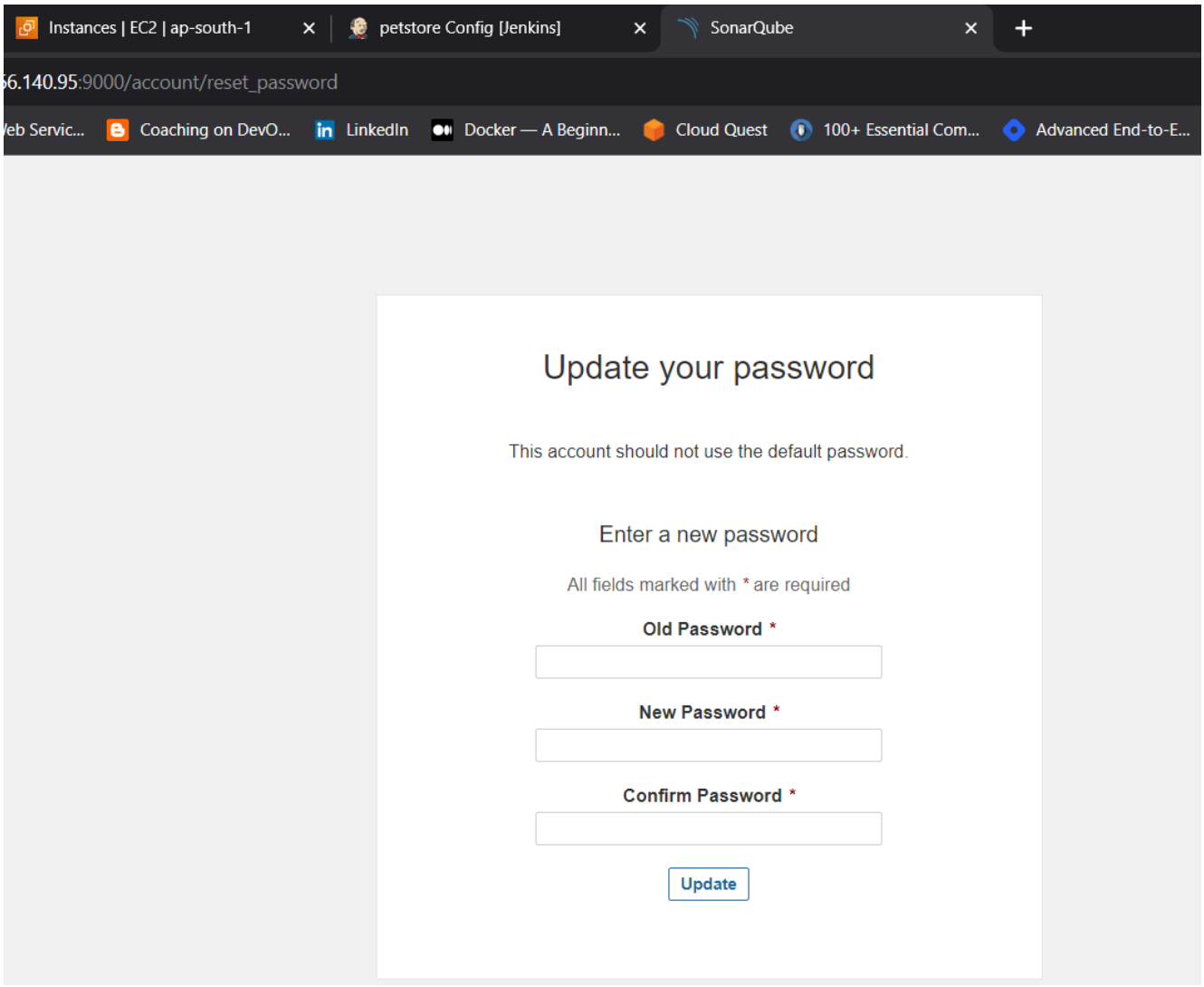
Now Copy the public IP again and paste it into a new tab in the browser with 9000

```
<ec2-ip:9000>  #runs sonar container
```

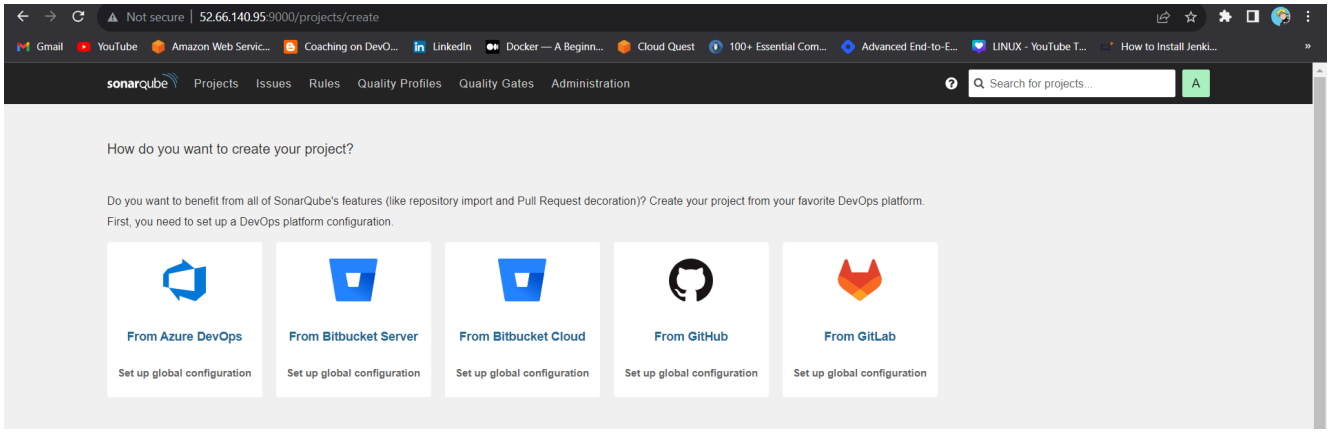


Enter username and password, click on login and change password

```
username admin
password admin
```



Update New password, This is Sonar Dashboard.



Step5: Terraform plugin install and EKS provision

Now go to Jenkins and add a terraform plugin to provision the AWS EKS using the Pipeline Job.

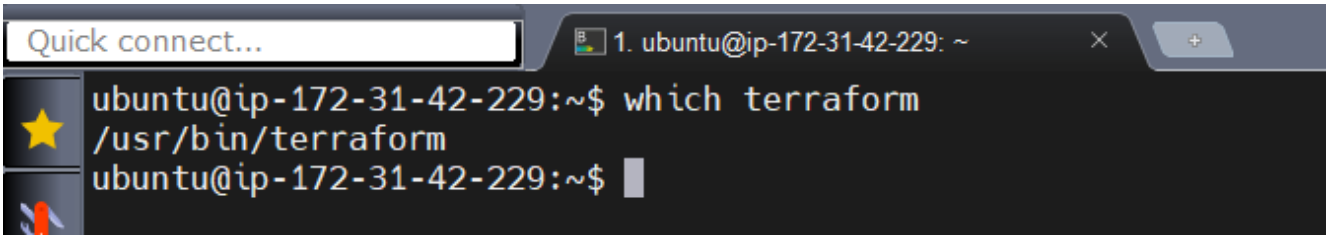
Go to Jenkins dashboard –> Manage Jenkins –> Plugins

Available Plugins, Search for Terraform and install it.

Go to Putty and use the below command

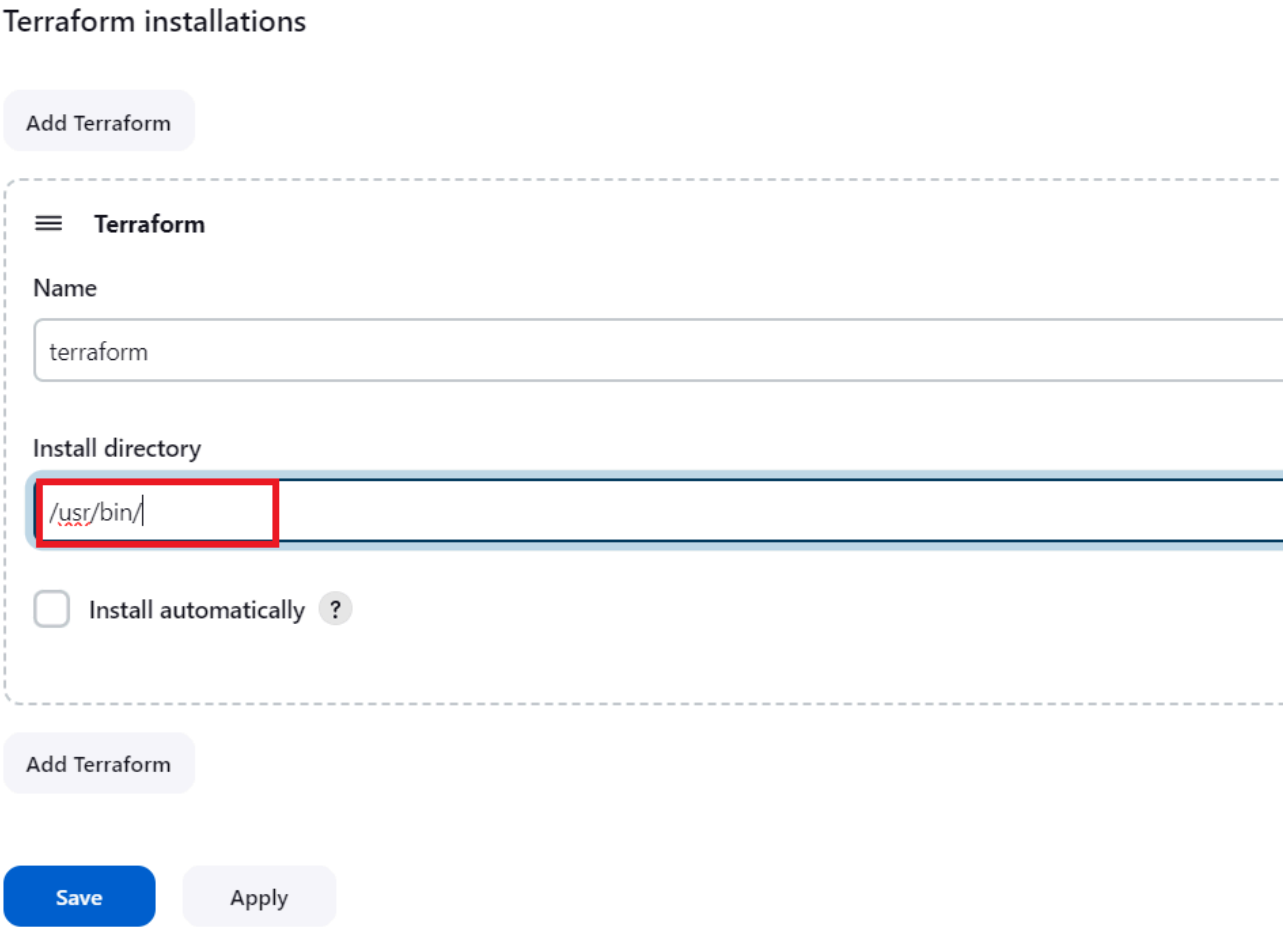
let's find the path to our Terraform (we will use it in the tools section of Terraform)

```
which terraform
```



Now come back to Manage Jenkins –> Tools

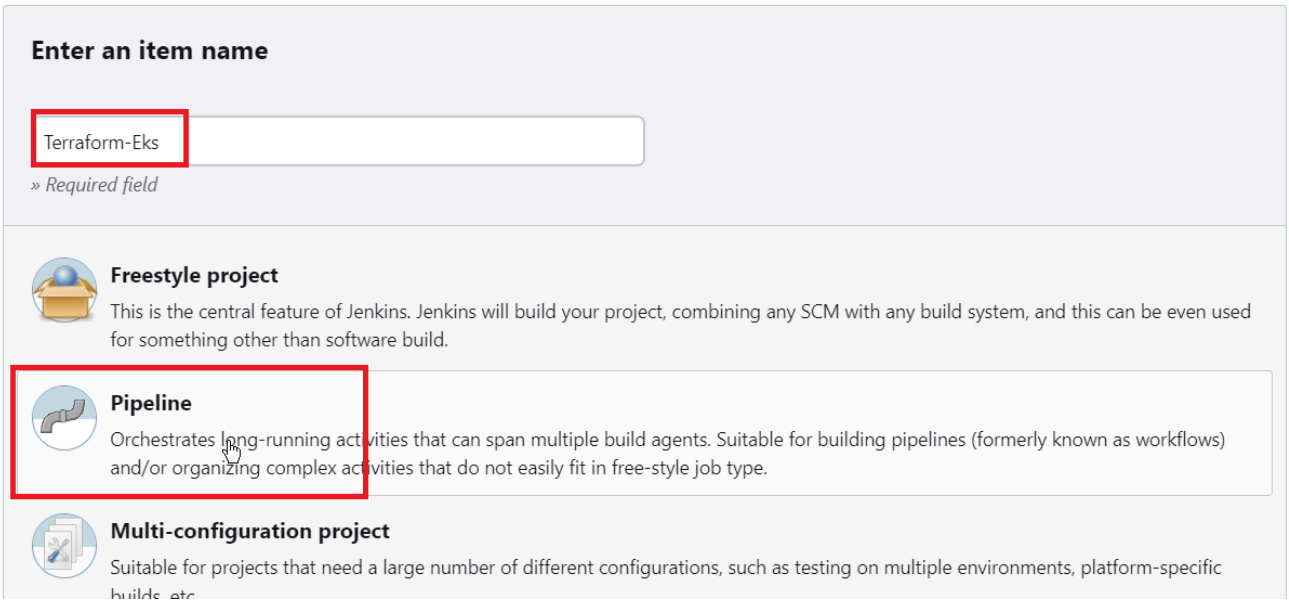
Add the terraform in Tools



Apply and save.

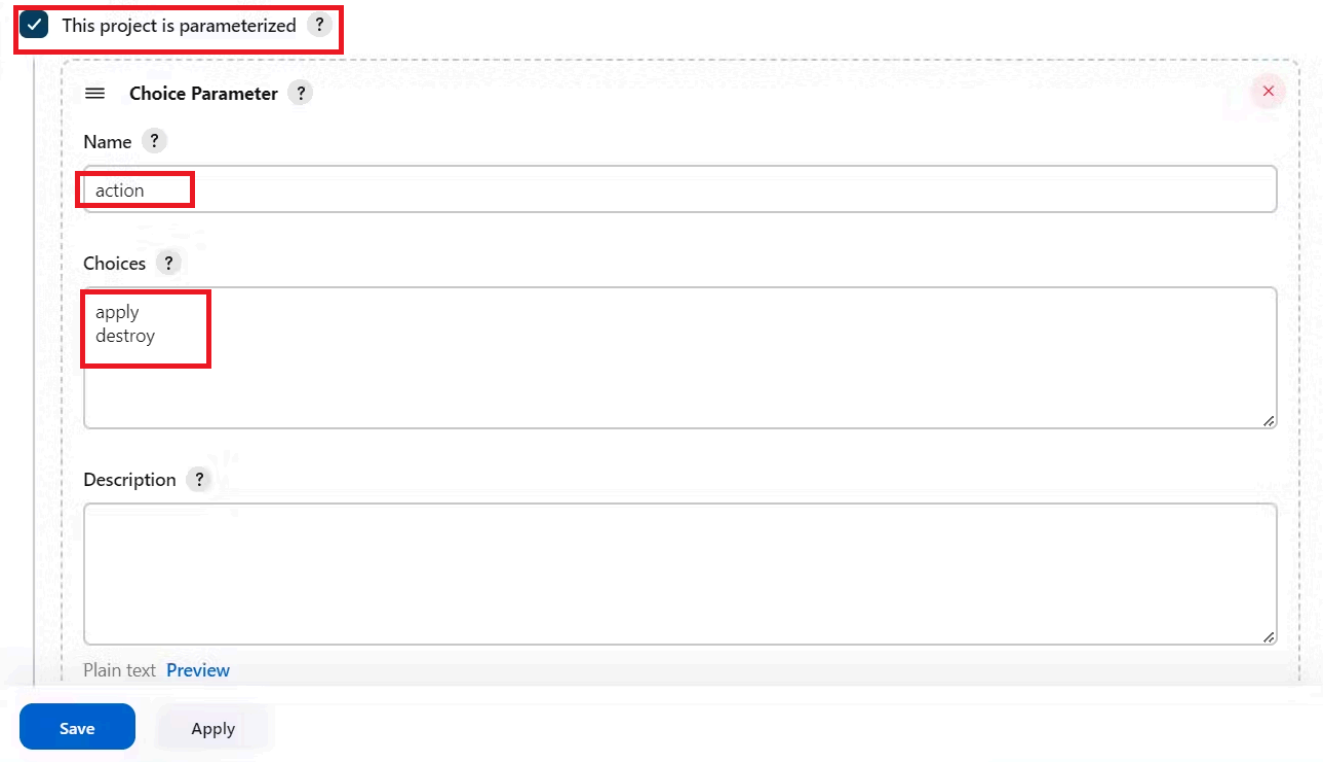
CHANGE YOUR S3 BUCKET NAME IN THE BACKEND.TF

Now create a new job for the EKS provision



I want to do this with build parameters to apply and destroy while building only.

you have to add this inside job like the below image

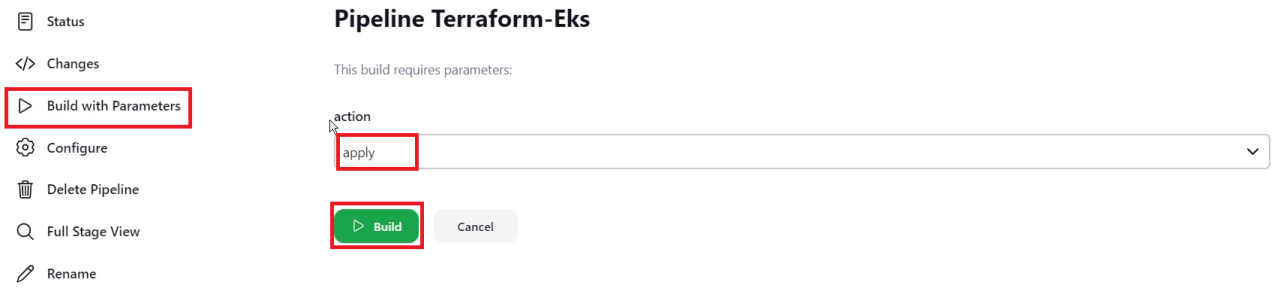


Let's add a pipeline

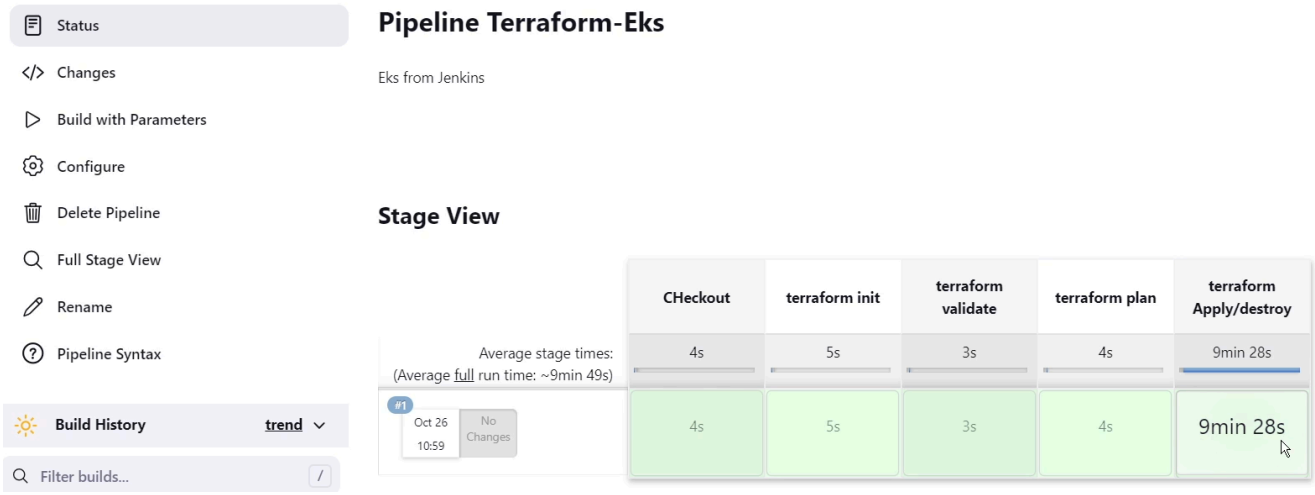
```
pipeline{
    agent any
    stages {
        stage('Checkout from Git'){
            steps{
                git branch: 'main', url: 'https://github.com/Aj7Ay/uber·
            }
        }
        stage('Terraform version'){
             steps{
                 sh 'terraform --version'
             }
        }
        stage('Terraform init'){
             steps{
                 dir('EKS_TERRAFORM') {
                      sh 'terraform init'
                   }
             }
        }
```

```
        stage('Terraform validate'){
             steps{
                 dir('EKS_TERRAFORM') {
                      sh 'terraform validate'
                   }
             }
        }
        stage('Terraform plan'){
             steps{
                 dir('EKS_TERRAFORM') {
                      sh 'terraform plan'
                   }
             }
        }
        stage('Terraform apply/destroy'){
             steps{
                 dir('EKS_TERRAFORM') {
                      sh 'terraform ${action} --auto-approve'
                   }
             }
        }
    }
}
```

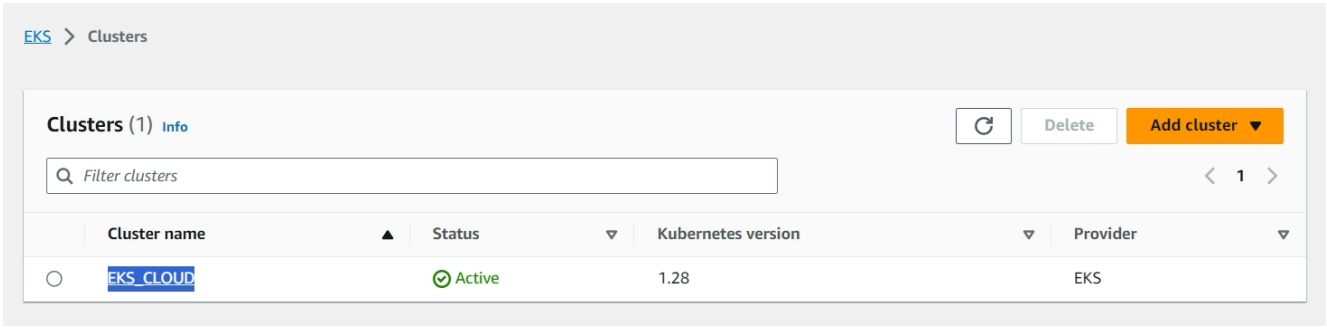
Let's apply and save and Build with parameters and select action as apply



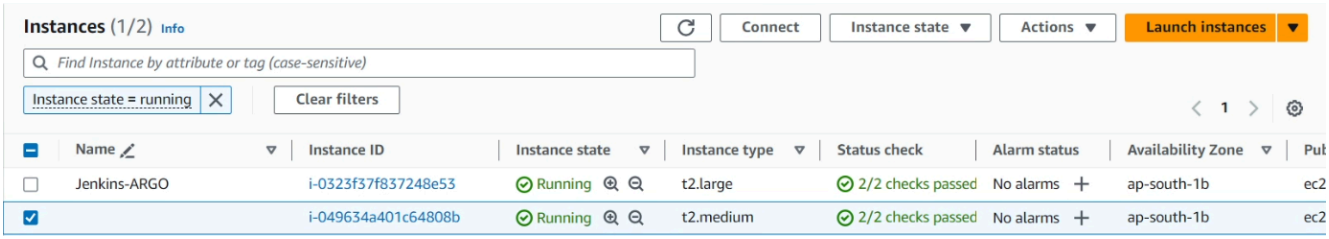
Stage view it will take max 10mins to provision



Check in Your Aws console whether it created EKS or not.



Ec2 instance is created for the Node group



Step6: Plugins installation & setup (Java, Sonar, Nodejs, owasp, Docker)

Go to Jenkins dashboard

Manage Jenkins –> Plugins –> Available Plugins

Search for the Below Plugins

```
Eclipse Temurin installer
```

Sonarqube Scanner

NodeJs

Owasp Dependency-Check

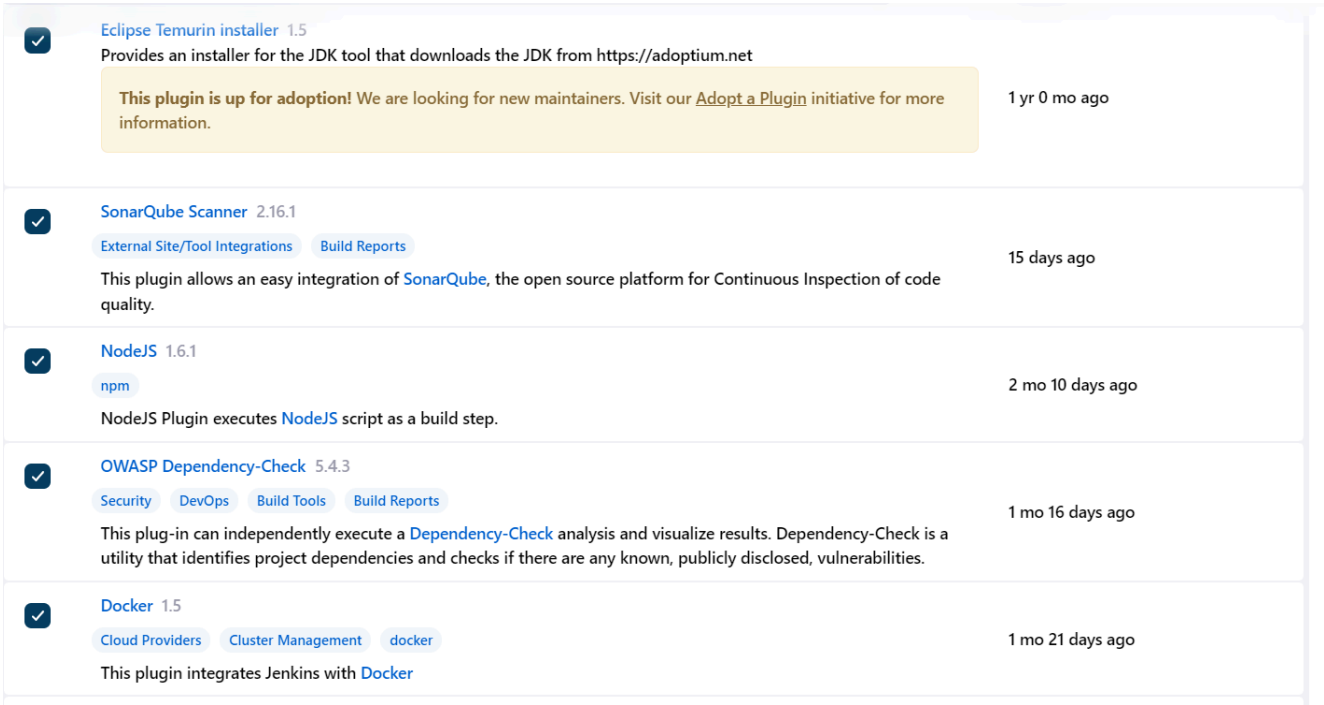
Docker

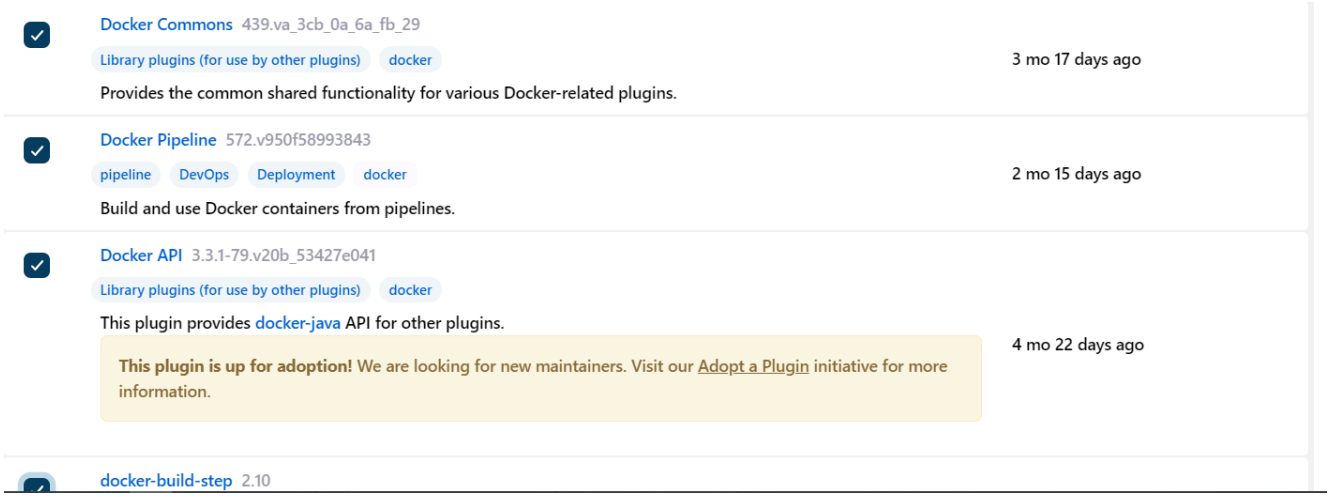
Docker Commons

Docker Pipeline

Docker API

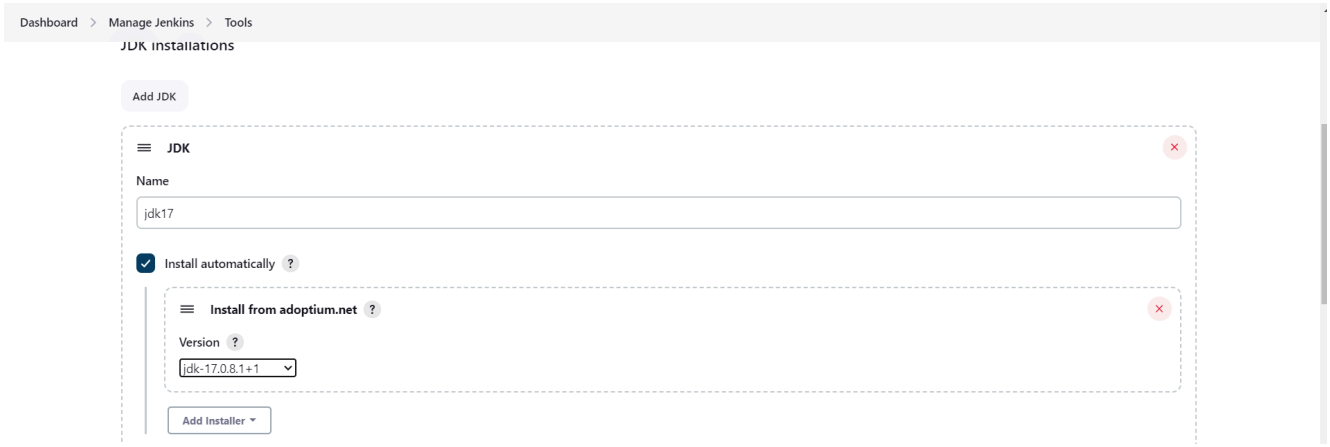
Docker-build-step



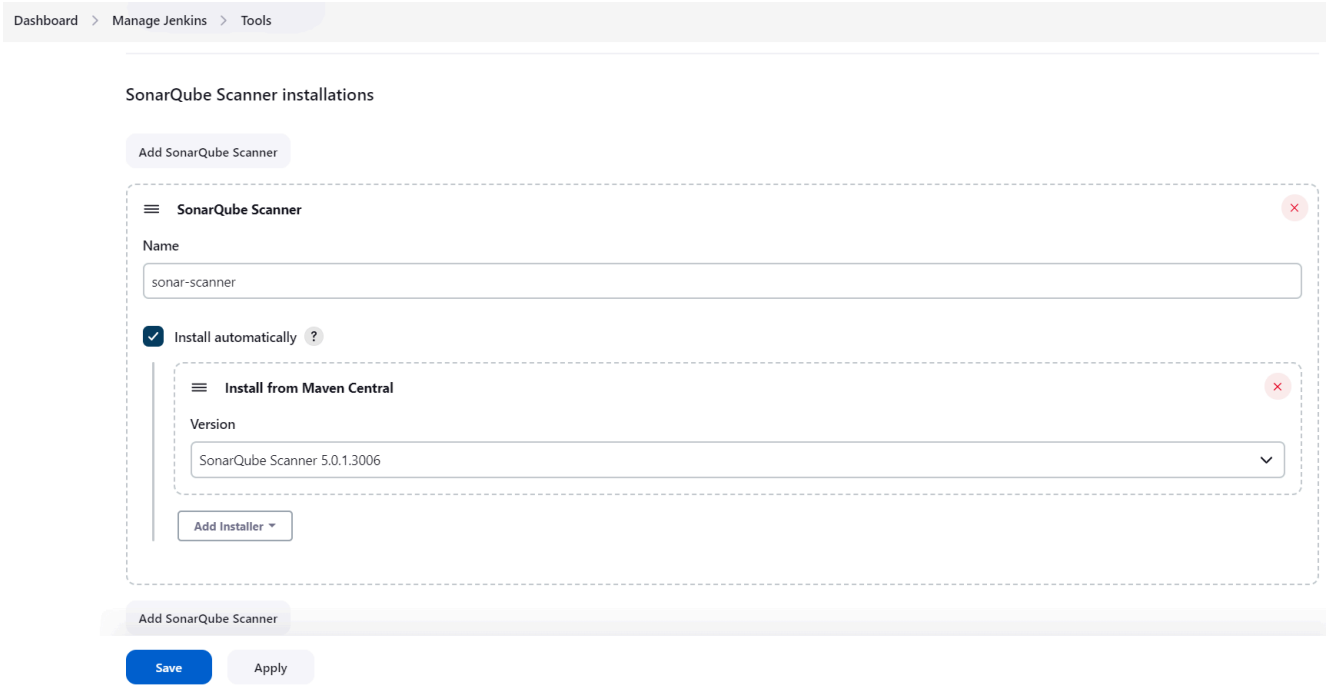


Step7: Configure in Global Tool Configuration

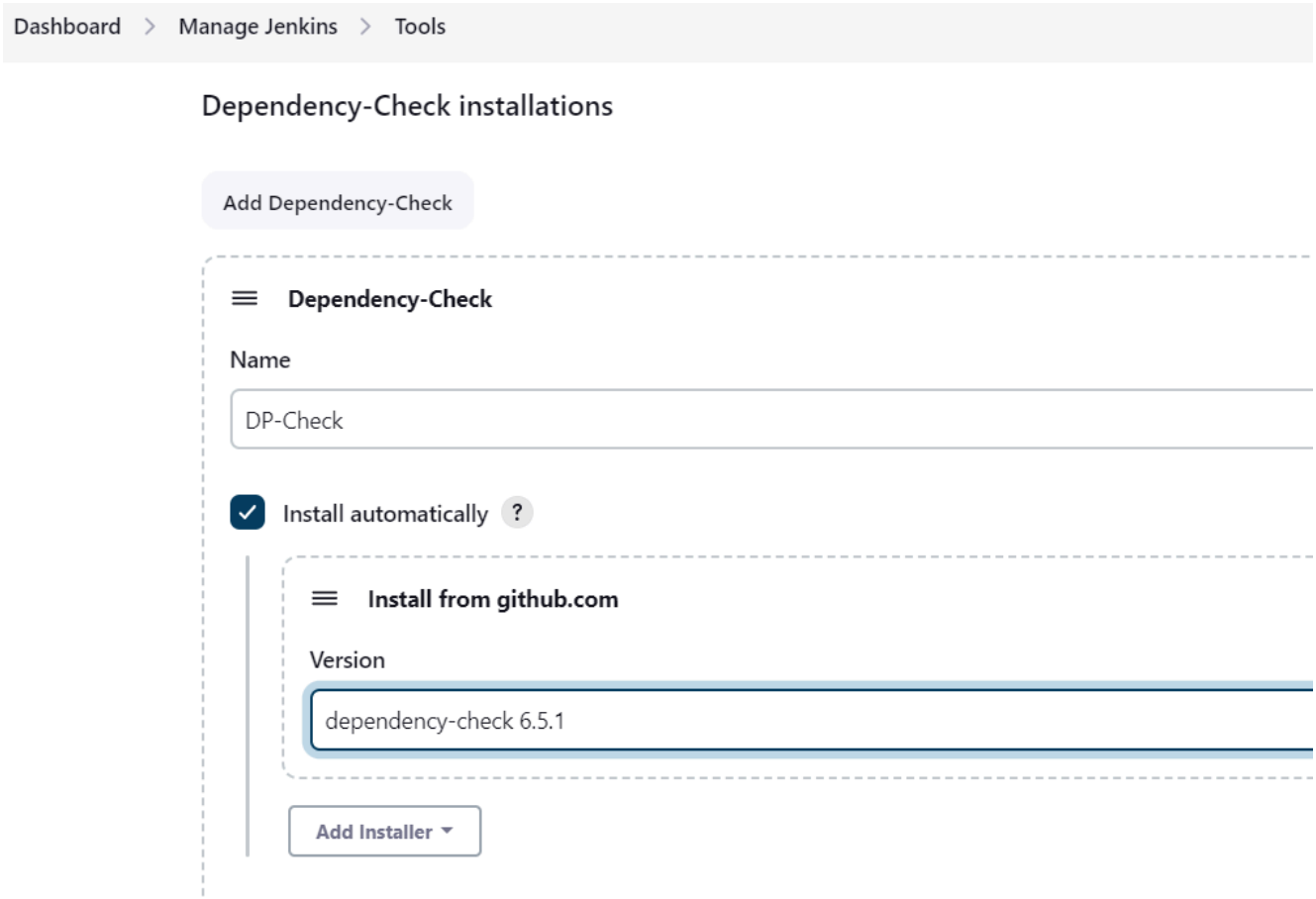
Goto Manage Jenkins → Tools → Install JDK(17) and NodeJs(16)→ Click on Apply and Save



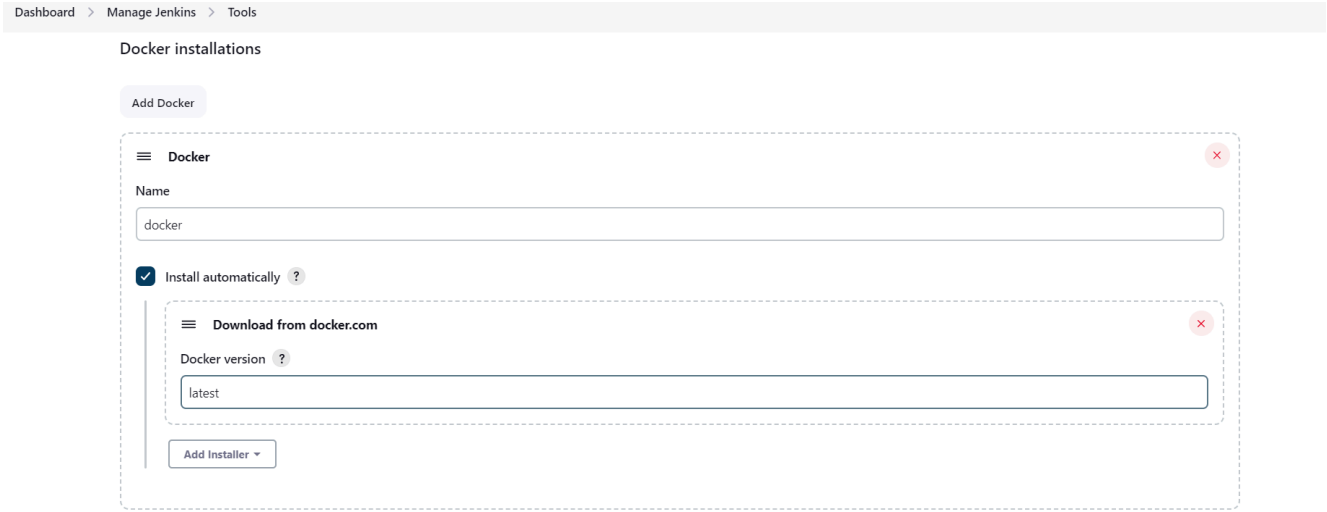
For Sonarqube use the latest version



For Owasp use the 6.5.1 version



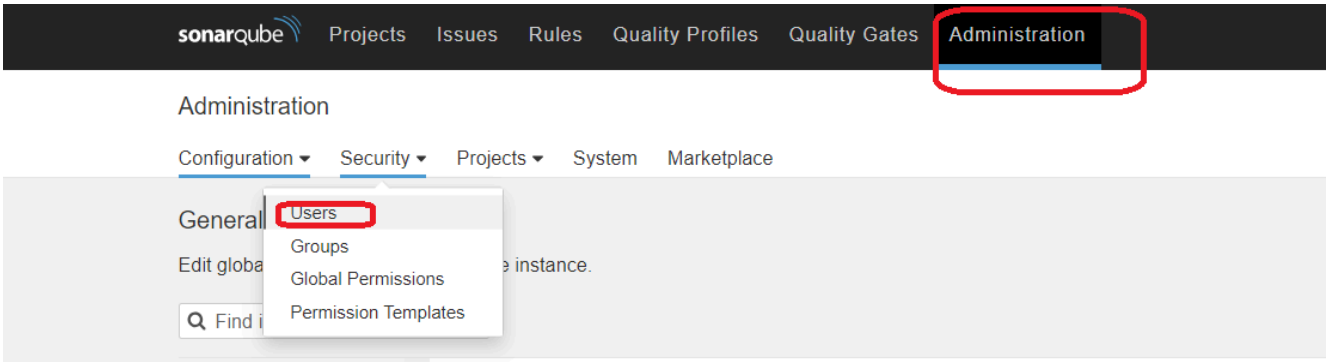
Use the latest version of Docker



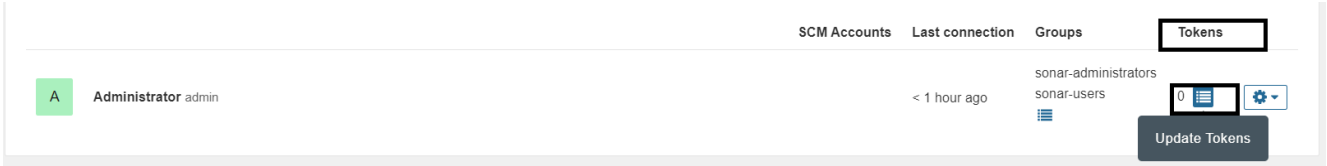
Click apply and save.

Step8: Configure Sonar Server in Manage Jenkins

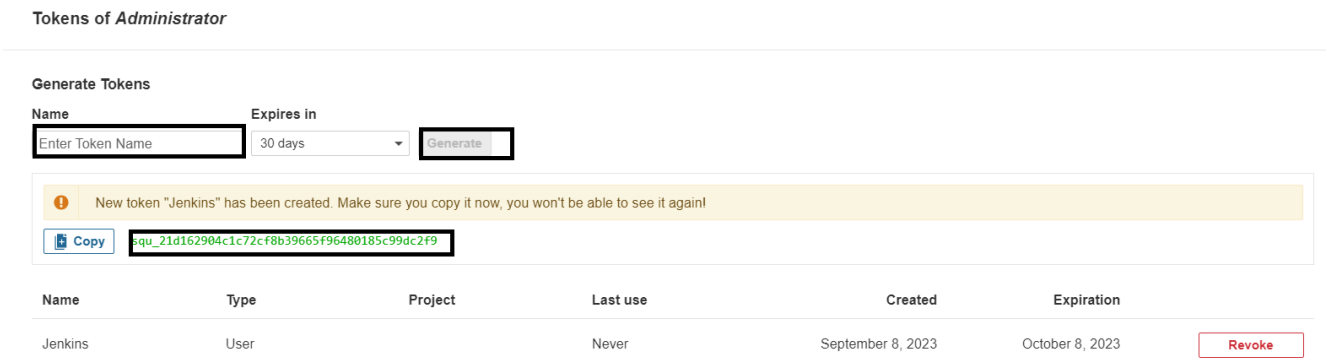
Grab the Public IP Address of your EC2 Instance, Sonarqube works on Port 9000, so <Public IP>:9000. Goto your Sonarqube Server. Click on Administration → Security → Users → Click on Tokens and Update Token → Give it a name → and click on Generate Token



click on update Token

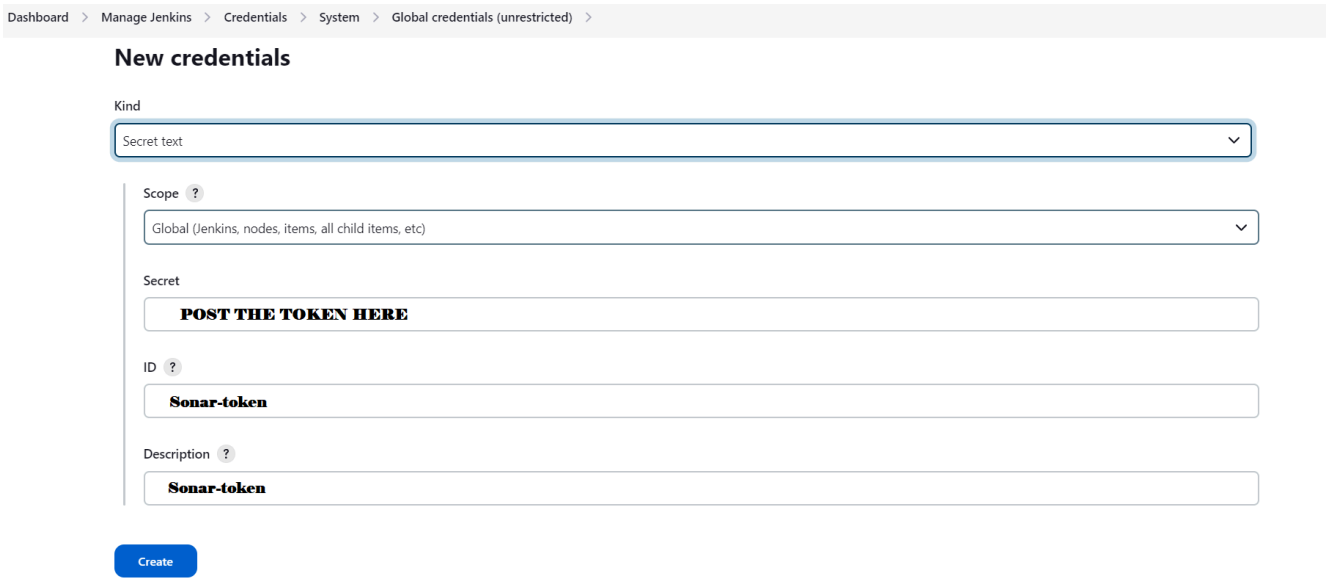


Create a token with a name and generate



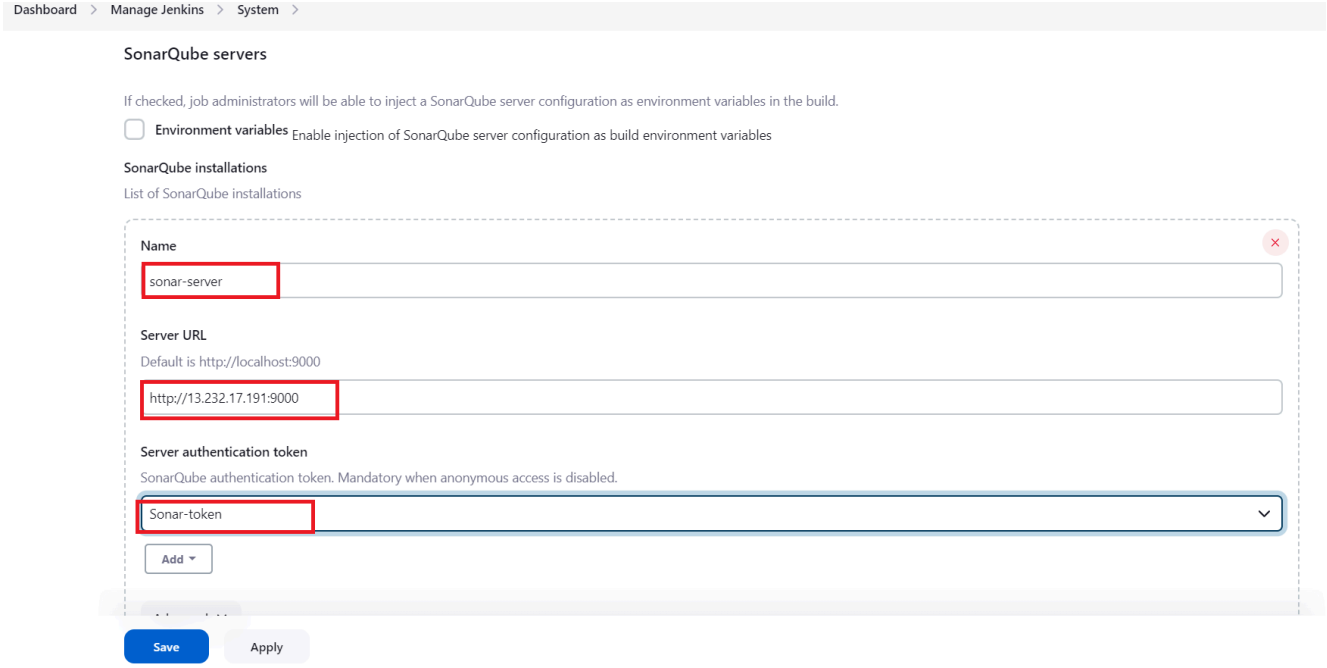
copy Token

Goto Jenkins Dashboard → Manage Jenkins → Credentials → Add Secret Text. It should look like this



You will this page once you click on create

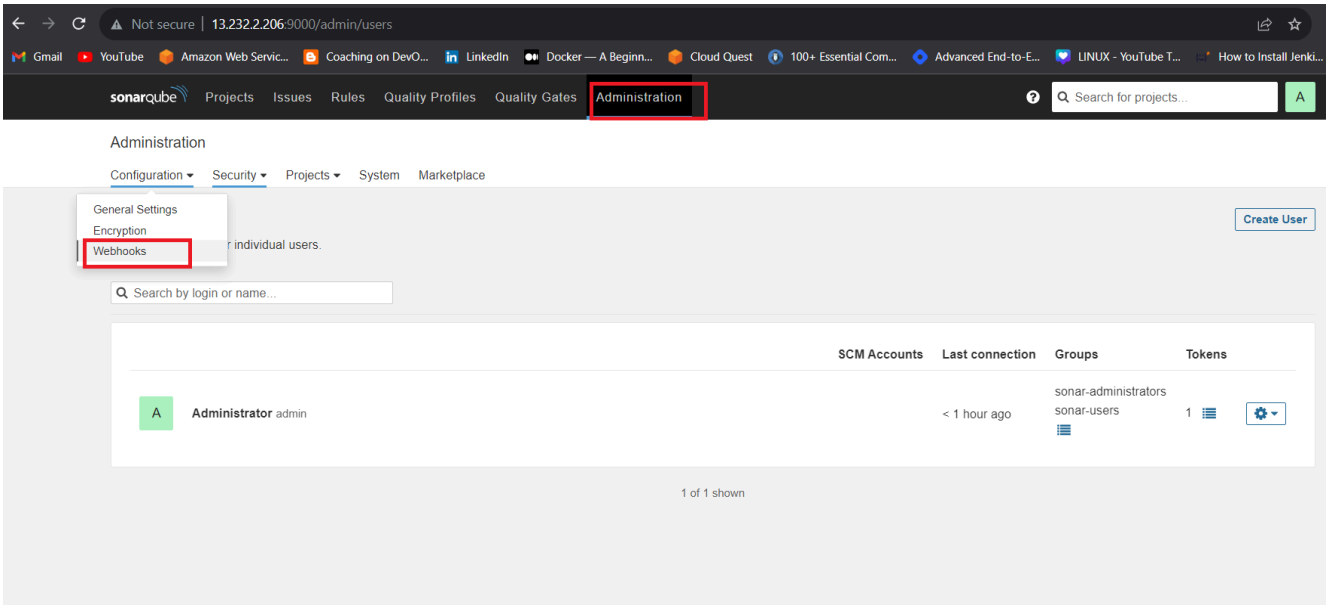
Now, go to Dashboard → Manage Jenkins → System and Add like the below image.



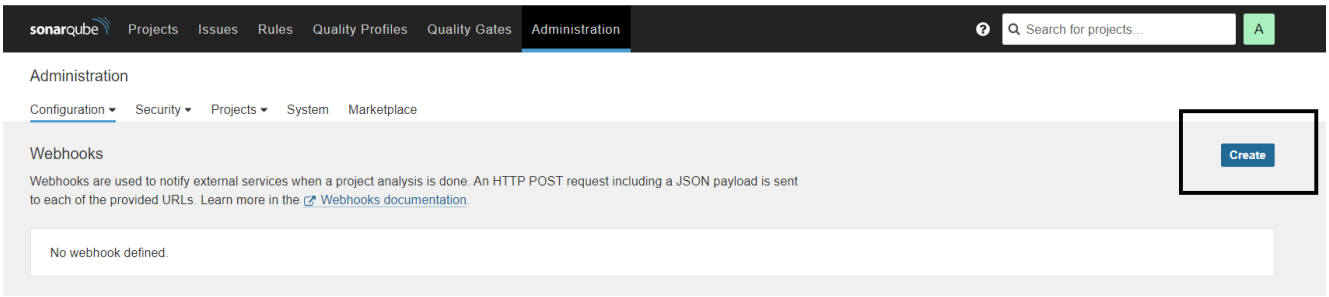
Click on Apply and Save

In the Sonarqube Dashboard add a quality gate also

Administration–> Configuration–>Webhooks

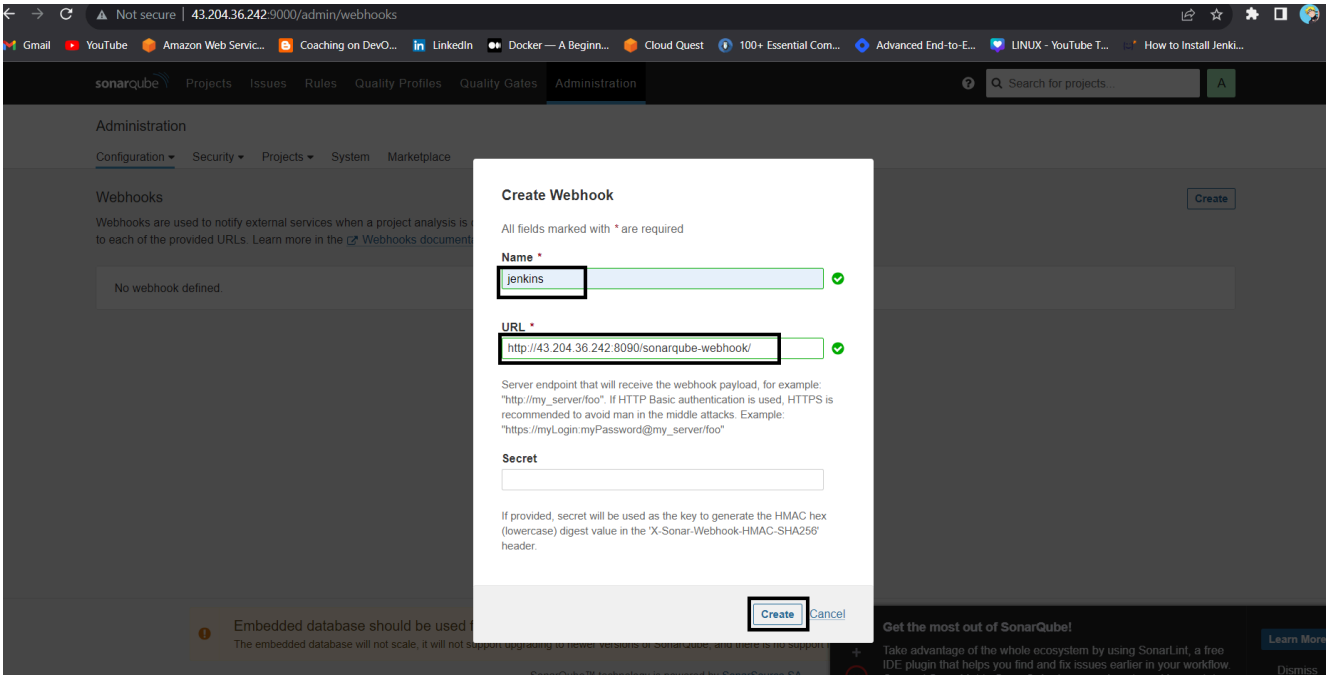


Click on Create



Add details

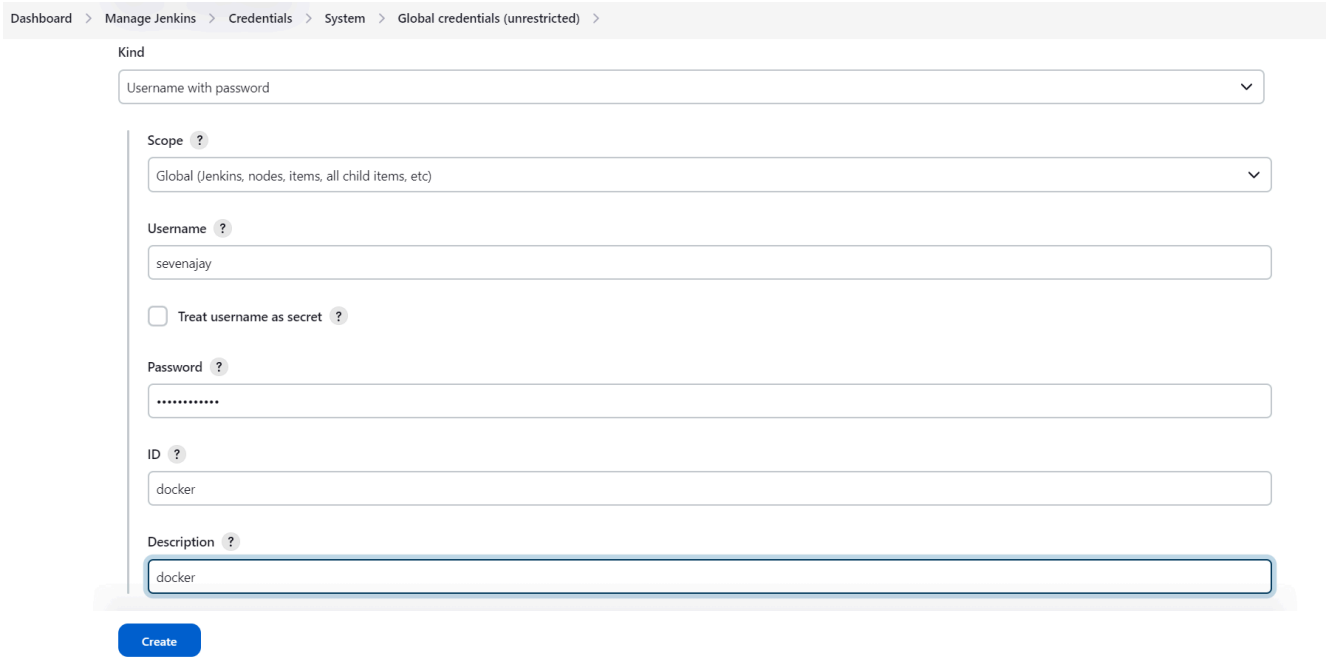
```
#in url section of quality gate
<http://jenkins-public-ip:8080>/sonarqube-webhook/>
```



Now add Docker credentials to the Jenkins to log in and push the image

Manage Jenkins –> Credentials –> global –> add credential

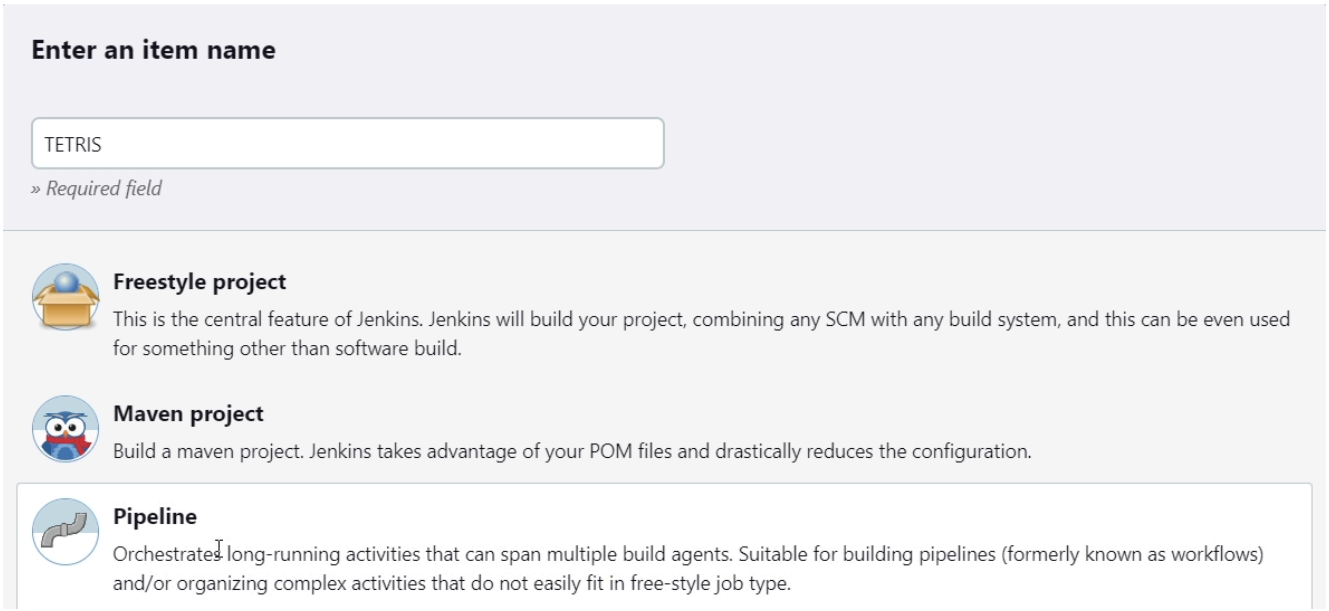
Add DockerHub Username and Password under Global Credentials



Create.

Step09: Pipeline upto Docker

Now let's create a new job for our pipeline



Add this to Pipeline

```
pipeline{
    agent any
    tools{
```

```
        jdk 'jdk17'
        nodejs 'node16'
    }
    environment {
        SCANNER_HOME=tool 'sonar-scanner'
    }
    stages {
        stage('clean workspace'){
            steps{
                cleanWs()
            }
        }
        stage('Checkout from Git'){
            steps{
                git branch: 'main', url: 'https://github.com/Aj7Ay/uber-
            }
        }
        stage("Sonarqube Analysis "){
            steps{
                withSonarQubeEnv('sonar-server') {
                    sh ''' $SCANNER_HOME/bin/sonar-scanner -Dsonar.proje
                    -Dsonar.projectKey=Uber'''
                }
            }
        }
        stage("quality gate"){
           steps {
                script {
                    waitForQualityGate abortPipeline: false, credentials
                }
            }
        }
        stage('Install Dependencies') {
            steps {
                sh "npm install"
            }
        }
        stage('OWASP FS SCAN') {
            steps {
                dependencyCheck additionalArguments: '--scan ./ --disab
                dependencyCheckPublisher pattern: '**/dependency-check-r
            }
        }
         stage('TRIVY FS SCAN') {
            steps {
```

```
                sh "trivy fs . &gt; trivyfs.txt"
            }
        }
        stage("Docker Build &amp; Push"){
            steps{
                script{
                   withDockerRegistry(credentialsId: 'docker', toolName
                       sh "docker build -t uber ."
                       sh "docker tag uber sevenajay/uber:latest "
                       sh "docker push sevenajay/uber:latest "
                    }
                }
            }
        }
        stage("TRIVY"){
            steps{
                sh "trivy image sevenajay/uber:latest &gt; trivyimage.t
            }
        }
        stage("deploy_docker"){
            steps{
                sh "docker run -d --name uber -p 3000:3000 sevenajay/ub
            }
        }
    }
}
```

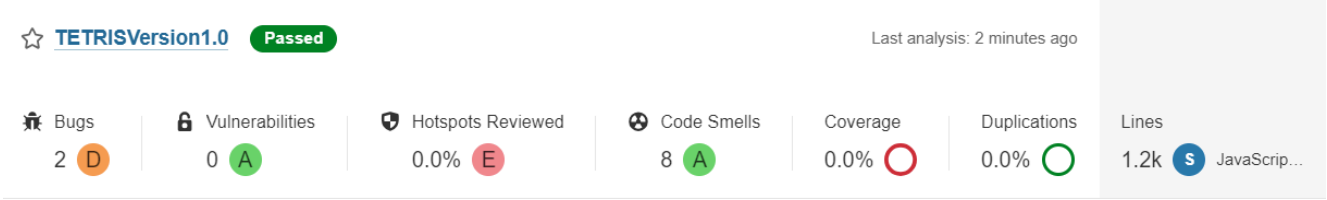
Click on Apply and save.

Build now

Stage view

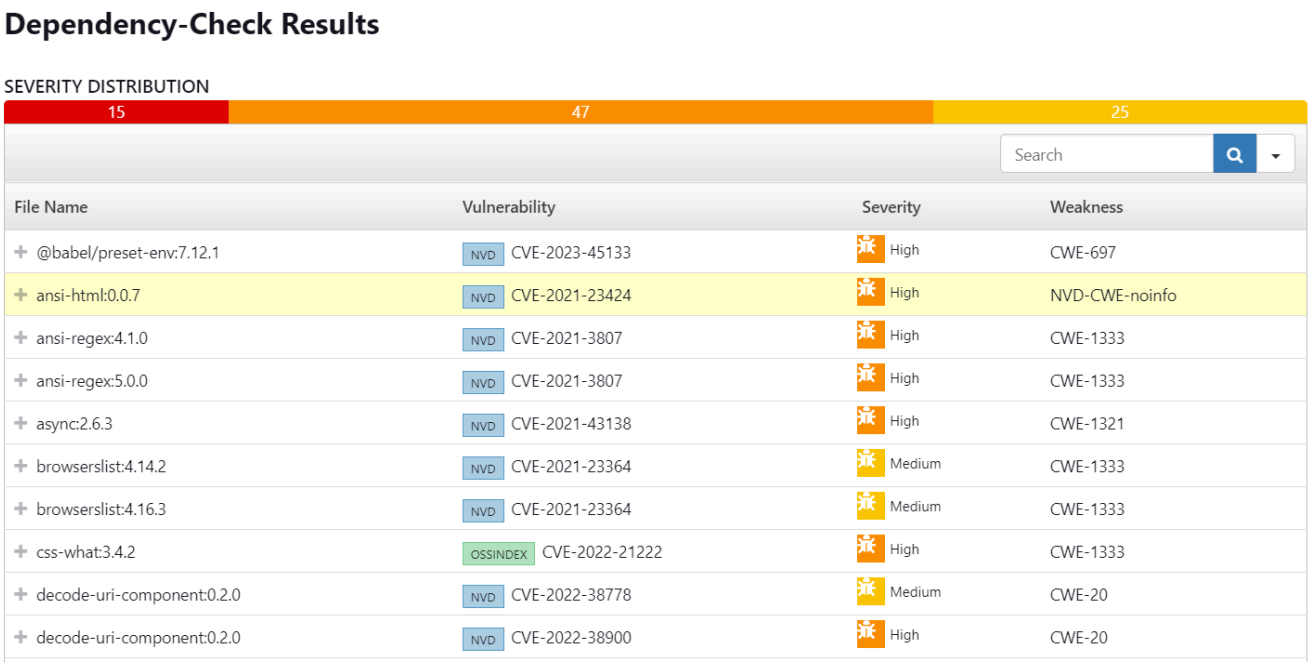
Declarative: Tool Install	CO	Sonar analysis	QG	NPM	TRIVY FS	OWASP FS SCAN	Docker build and push	TRIVY IMAGE
10s	1s	29s	327ms	20s	3s	12min 29s	1min 9s	57s
199ms	1s	35s	346ms	12s	4s	6min 47s	3min 27s	2min 52s

To see the report, you can go to Sonarqube Server and go to Projects.

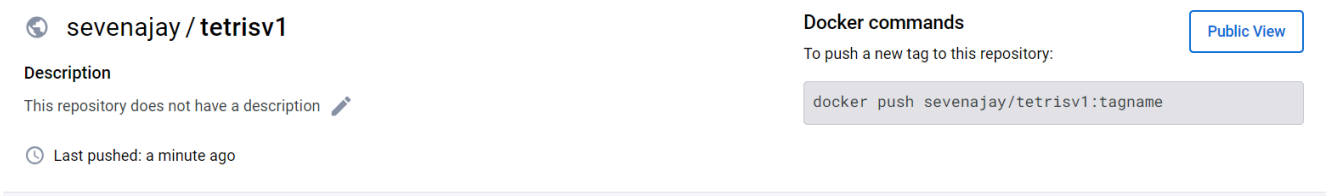


You can see the report has been generated and the status shows as passed. You can see that there are 1.2k lines it scanned. To see a detailed report, you can go to issues.

OWASP, You will see that in status, a graph will also be generated and Vulnerabilities.



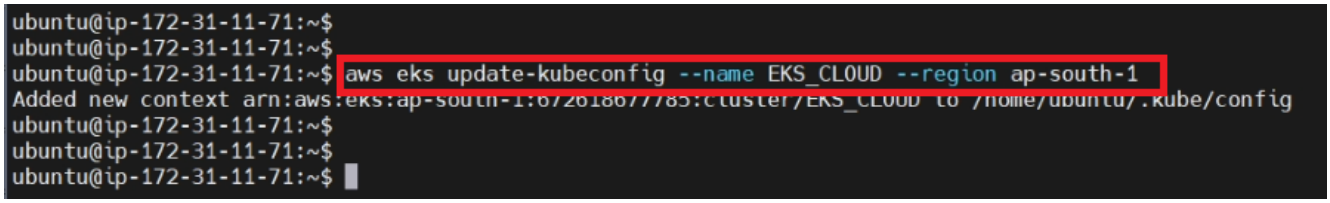
When you log in to Dockerhub, you will see a new image is created



Step10: Kubernetes Deployment

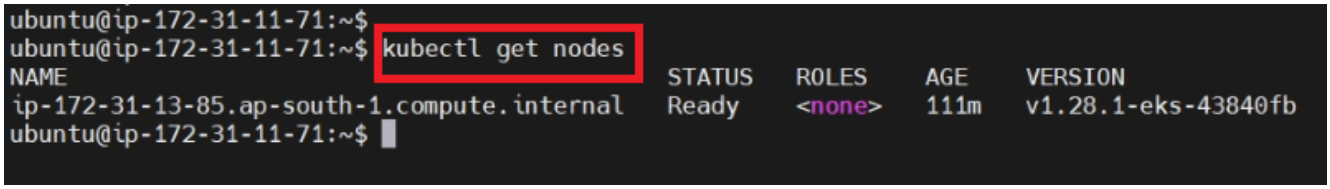
Go to Putty of your Jenkins instance SSH and enter the below command

```
aws eks update-kubeconfig --name <CLUSTER NAME> --region <CLUSTER REGIOI
aws eks update-kubeconfig --name EKS_CLOUD --region ap-south-1
```



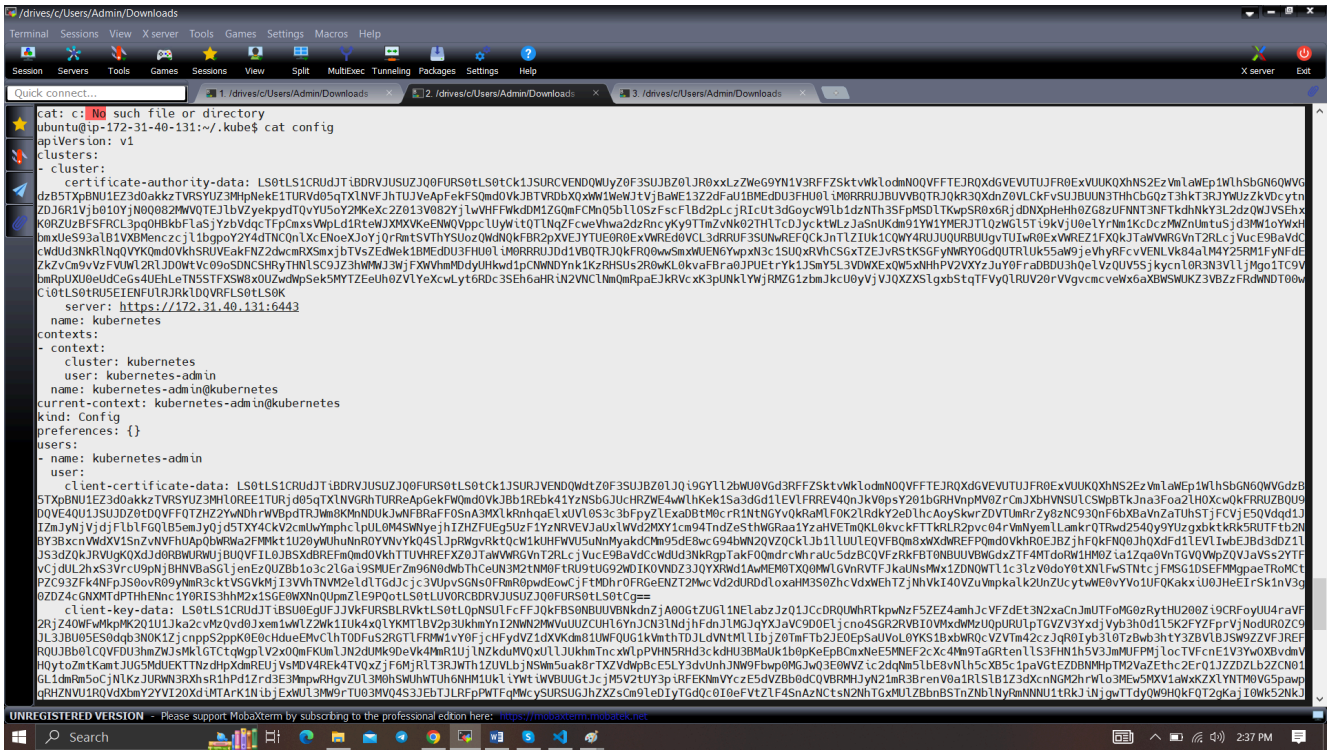
Let's see the nodes

```
kubectl get nodes
```



Copy the config file to Jenkins master or the local file manager and save it

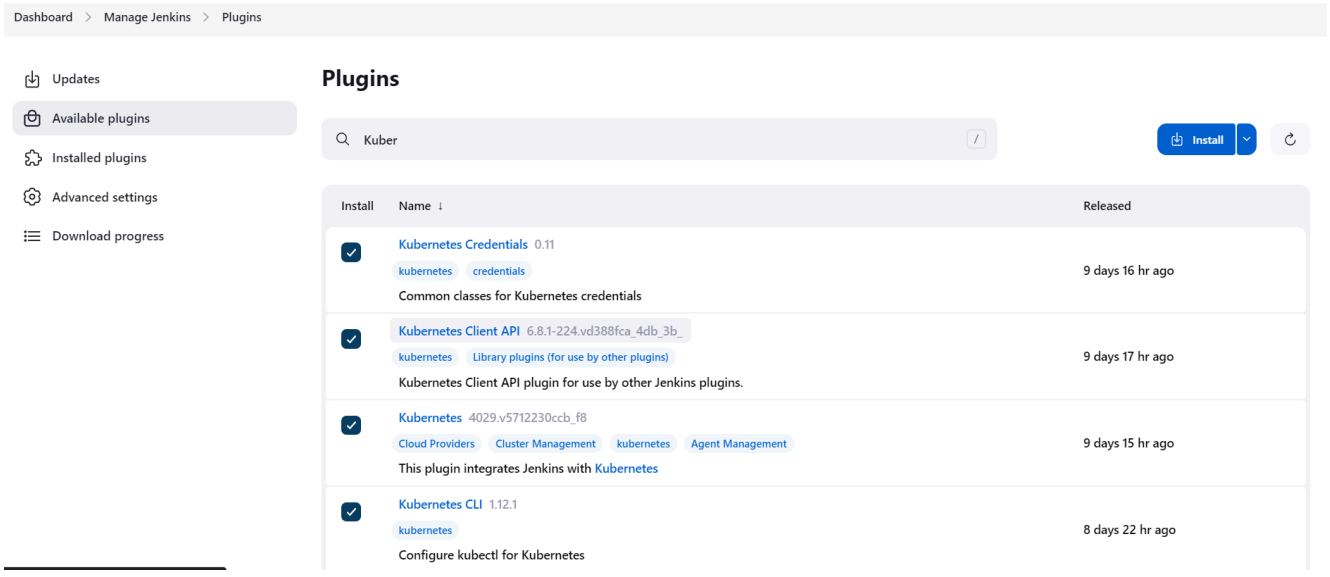
```
cat .kube/config
```



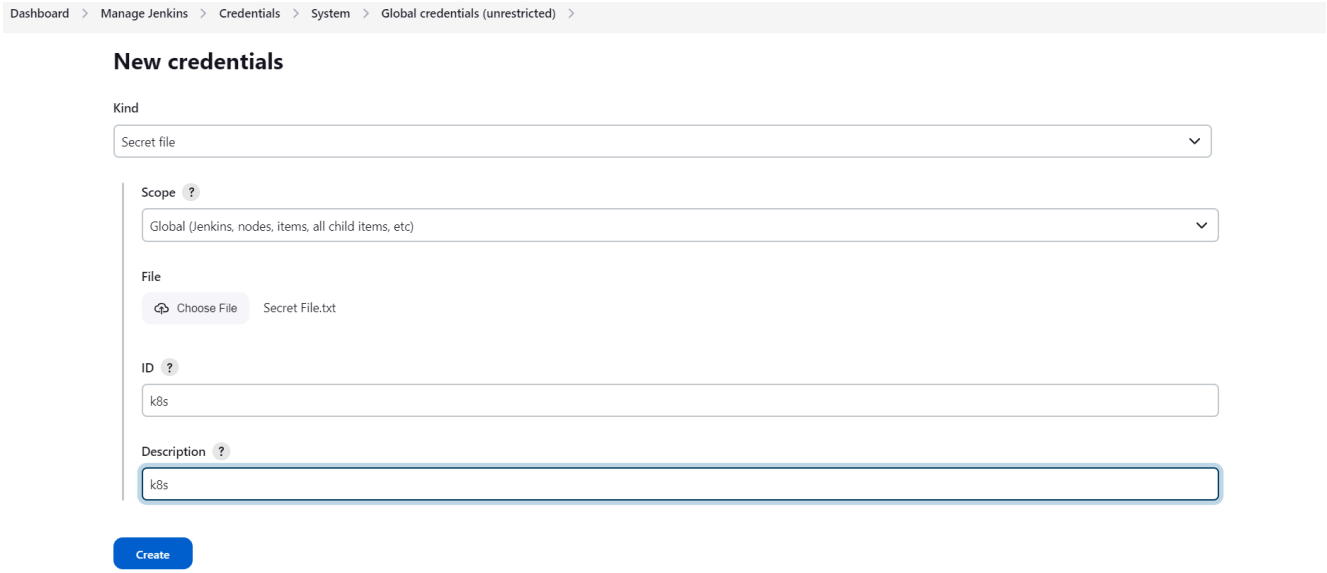
copy it and save it in documents or another folder save it as secret-file.txt

Note: create a secret-file.txt in your file explorer save the config in it and use this at the kubernetes credential section.

Install Kubernetes Plugin, Once it's installed successfully



goto manage Jenkins –> manage credentials –> Click on Jenkins global –> add credentials



final step to deploy on the Kubernetes cluster

```
stage('Deploy to kubernets'){
            steps{
                script{
                    dir('K8S') {
                        withKubeConfig(caCertificate: '', clusterName:
                                sh 'kubectl apply -f deployment.yml'
                                sh 'kubectl apply -f service.yml'
                        }
                    }
                }
            }
        }
```

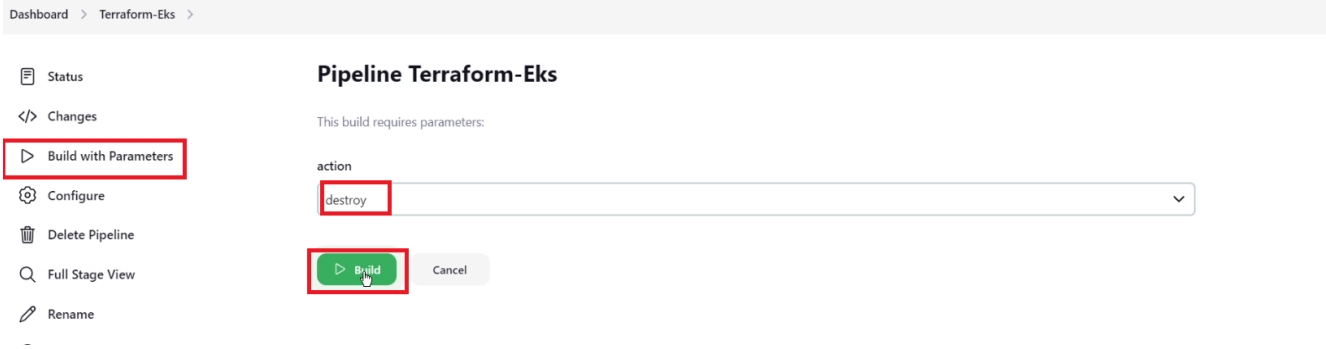
You will see output like this.

Step11: Destruction

Now Go to Jenkins Dashboard and click on Terraform-Eks job

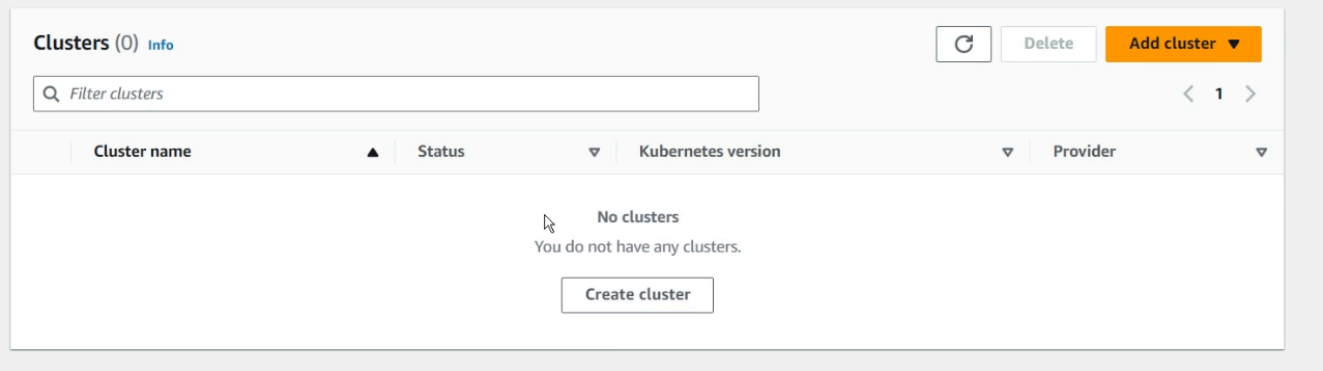
And build with parameters and destroy action

It will delete the EKS cluster that provisioned



After 10 minutes cluster will delete and wait for it. Don't remove ec2 instance till that time.

Cluster deleted



Delete the Ec2 instance.

Ajay Kumar Yegireddi is a DevSecOps Engineer and System Administrator, with a passion for sharing real-world DevSecOps projects and tasks. **Mr. Cloud Book**, provides hands-on tutorials and practical insights to help others master DevSecOps tools and workflows. Content is designed to bridge the gap between development, security, and operations, making complex concepts easy to understand for both beginners and professionals.

Comments

3 responses to “DevSecOps CI/CD Pipeline for an Uber Clone”

» DevopsTechPulse
29 December 2023

[...] DevSecOps CI/CD Pipeline for an Uber Clone [...]

Reply

Nazir
31 December 2023

Sir, Could you make video on above article with brief explanation it will really helpful.

Reply

mrcloudbook.com
31 December 2023

The process is same as old video projects

Reply

Leave a Reply

Your email address will not be published. Required fields are marked *

Comment *

Name *

Email *

Website

Save my name, email, and website in this browser for the next time I comment.

I'm not a robot

reCAPTCHA
Privacy - Terms

Post Comment

Uncategorized AI AI, DevOps

How to Automate Incident Response : How Q Developer Helped Me Automate a Daily Pain Point

22 July 2025

How to Run Docker Model Runner on Ubuntu 24.04

11 July 2025

How to Install docker-ai on Ubuntu 24.04

15 June 2025

Upskill with Ajay: DevSecOps Mastery

Join Mr Cloud book to master DevSecOps through real-world projects. Learn CI/CD, security integration, automation, and more, gaining hands-on skills for industry-level challenges.

Important Links

Privacy Policy

Terms & Conditions

Contact

Resources

Blog

YouTube Channel

Follow Us on YouTube