

End To End Deployment of React-App on AWS EKS with Jenkins

Create and ssh to EC2 instance.

ADD ports- 80, 8080, 3000 in Inbounds rules to ec2 security group.

1. install java

```
sudo apt update
sudo apt-get install default-jdk -y
java --version
```

2. install jenkins on server

```
curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key | sudo tee \
  /usr/share/keyrings/jenkins-keyring.asc > /dev/null
echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
  https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
```

```
sudo apt-get update
sudo apt-get install jenkins
```

3. Start jenkins

```
sudo systemctl enable jenkins
sudo systemctl start jenkins
sudo systemctl status jenkins
```

Make sure port 8080 and 80 are added in inbounds rules security group.
To access jenkins page: "ec2-public-ip:8080"

4. install AWS CLI for working with AWS services as EKS, ECR

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

5. install eksctl - command line tool for working with EKS clusters that automates many individual tasks.

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

6. install kubectl - command line tool for working with Kubernetes clusters

```
curl -s https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo apt-key add -
sudo touch /etc/apt/sources.list.d/kubernetes.list
echo "deb http://apt.kubernetes.io/ kubernetes-xenial main" | sudo tee -a
/etc/apt/sources.list.d/kubernetes.list
sudo apt-get update
sudo apt-get install -y kubectl
```

7. create AWS EKS cluster with eksctl cli

But jenkins-ec2 instance requires certain privileges to create the cluster.

2 ways:

1. create access key and secret key
2. create IAM role with admin access policy

I will use 2nd.

8. Create iam role with AdministrationAccess and attach with ec2.

9. Create AWS EKS cluster using eksctl:

```
eksctl create cluster --name my-cluster --region us-east-1 --nodegroup-name my-nodes
--node-type t3.small --managed --nodes 2
```

Once Cluster is created verify it-

```
kubectl get nodes
kubectl get pods
kubectl get ns
kubectl get svc
```

10. Create AWS ECR repo

11. Install Docker

```
sudo apt install docker.io -y
sudo usermod -aG docker $USER
```

12. Install Jenkins Plugins

Docker, Dockerpipeline, Kubernetes CLI

13. Verify If EKS Cluster is up and running

```
eksctl get cluster --name my-eks-cluster --region us-east-1
```

kubectrl command works with "/home/ubuntu/.kube/config"

14. Setup Connection Between Jenkins and Kubernetes using "/home/ubuntu/.kube/config" file.

```
cat /home/ubuntu/.kube/config
```

Copy the content and save it in a text file and upload it in jenkins.

Path is : manage jenkins-> manage Credentials

Restart Docker and Jenkins to make sure all the changes are reflected.

```
sudo systemctl stop docker
sudo systemctl start docker
sudo systemctl daemon-reload
sudo systemctl status docker
```

```
sudo usermod -a -G docker jenkins
sudo service jenkins restart
```

EKS Cluster and ECR Repo has been created.

All the required packages and plug-ins has been installed.

Final Step: Now Lets Build the jenkins pipeline for deployment.

Build Pipeline: There will be 4 stages.

1. Checkout - clone git repo
2. Build docker
3. Push image to ECR
4. Deploy microservices into AKS Cluster

PipeLine Jenikns:

```
pipeline {
    agent any
    environment{
        registry = "532806123370.dkr.ecr.us-east-1.amazonaws.com/react-app"
    }
}
```

```

    stages {
      stage('Checkout from version Control') {
        steps {
          checkout scmGit(branches: [[name: '*/gh-pages-branch']], extensions: [],
userRemoteConfigs: [[url: 'https://github.com/shashiiitp19/my-React-Docker-K8S-app.git']])
        }
      }

      stage('Build Docker') {
        steps {
          script{
            docker.build registry
          }
        }
      }

      stage('push image to ECR') {
        steps {
          sh "aws ecr get-login-password --region us-east-1 | docker login --username
AWS --password-stdin 532806123370.dkr.ecr.us-east-1.amazonaws.com"
          sh "docker push
532806123370.dkr.ecr.us-east-1.amazonaws.com/react-app:latest"
        }
      }

      stage('K8S Deploy') {
        steps {
          script {
            sh ('aws eks update-kubeconfig --name my-eks-cluster --region us-east-1')
            sh "kubectl apply -f deploy-k8s-eks.yaml"
          }
        }
      }
    }
  }
}

```

If deployment is successful then we can see all the details-

```

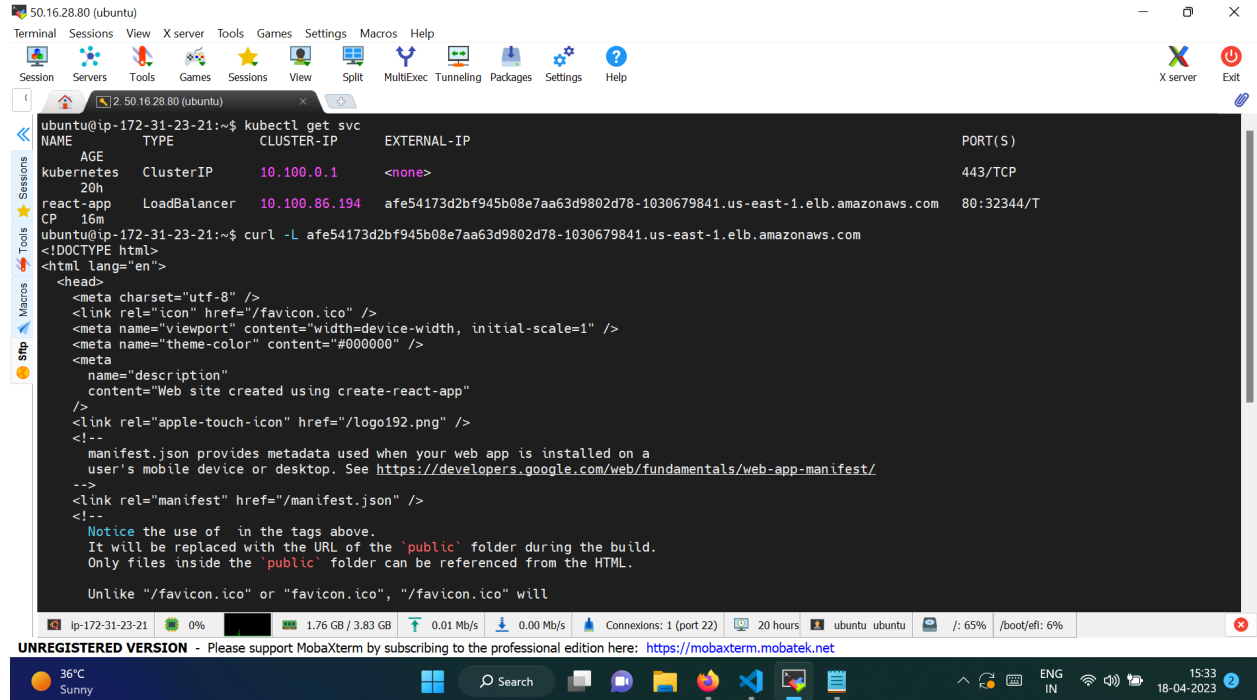
kubectl get deployment
kubectl get pods
kubectl get svc

```

Verify if React App is Running -

Use LoadBalancer URL:

1. `kubectl get svc`
2. `curl -L afe54173d2bf945b08e7aa63d9802d78-1030679841.us-east-1.elb.amazonaws.com`



The screenshot shows a MobaXterm terminal window with the following content:

```
ubuntu@ip-172-31-23-21:~$ kubectl get svc
```

NAME	AGE	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)
kubernetes	20h	ClusterIP	10.100.0.1	<none>	443/TCP
react-app	CP 16m	LoadBalancer	10.100.86.194	afe54173d2bf945b08e7aa63d9802d78-1030679841.us-east-1.elb.amazonaws.com	80:32344/T

```
ubuntu@ip-172-31-23-21:~$ curl -L afe54173d2bf945b08e7aa63d9802d78-1030679841.us-east-1.elb.amazonaws.com
```

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="utf-8" />
<link rel="icon" href="/favicon.ico" />
<meta name="viewport" content="width=device-width, initial-scale=1" />
<meta name="theme-color" content="#000000" />
<meta
  name="description"
  content="Web site created using create-react-app"
/>
<link rel="apple-touch-icon" href="/logo192.png" />
<!--
  manifest.json provides metadata used when your web app is installed on a
  user's mobile device or desktop. See https://developers.google.com/web/fundamentals/web-app-manifest/
-->
<link rel="manifest" href="/manifest.json" />
<!--
  Notice the use of  in the tags above.
  It will be replaced with the URL of the 'public' folder during the build.
  Only files inside the 'public' folder can be referenced from the HTML.

  Unlike "/favicon.ico" or "favicon.ico", "/favicon.ico" will
```

The terminal window also shows a status bar at the bottom with system information like temperature (36°C), search bar, and system clock (15:33, 18-04-2023).

Or else to verify if app is running or not-

1. `kubectl get pods`
2. `kubectl logs react-app-7784b4c7-728dj`

```
ubuntu@ip-172-31-23-21:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
react-app-7784b4c7-728dj            1/1     Running   0           49m
react-app-7784b4c7-sxh2f            1/1     Running   0           49m
ubuntu@ip-172-31-23-21:~$ kubectl logs react-app-7784b4c7-728dj
> react-the-complete-guide@0.1.0 start /app
> react-scripts start

[wds]: Project is running at http://192.168.10.78/
[wds]: webpack output is served from
[wds]: Content not from webpack is served from /app/public
[wds]: 404s will fallback to /
Starting the development server...

Compiled successfully!

You can now view react-the-complete-guide in the browser.

  Local:            http://localhost:3000
  On Your Network:  http://192.168.10.78:3000

Note that the development build is not optimized.
To create a production build, use npm run build.

ubuntu@ip-172-31-23-21:~$
```

USE LoadBalancer's URL in browser to verify the React App is Running.

afe54173d2bf945b08e7aa63d9802d78-1030679841.us-east-1.elb.amazonaws.com

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User Name

Age (Years)

Add User

shashi (28 years old)

Once deployment is done, DELETE all the resources:

Delete EKS Cluster & Node Groups

Step-01: Delete Node Group

List EKS Clusters

```
eksctl get clusters
```

Capture Node Group name

```
eksctl get nodegroup --cluster=<clusterName>
```

```
eksctl get nodegroup --cluster=eksdemo1
```

Delete Node Group

```
eksctl delete nodegroup --cluster=<clusterName> --name=<nodegroupName>
```

```
eksctl delete nodegroup --cluster=eksdemo1 --name=eksdemo1-ng-public1
```

Step-02: Delete Cluster

Delete Cluster

```
eksctl delete cluster <clusterName>
```

```
eksctl delete cluster eksdemo1
```

kubectl delete all --all

Example-

pod "react-app-7784b4c7-728dj" deleted

pod "react-app-7784b4c7-sxh2r" deleted

service "kubernetes" deleted

service "react-app" deleted

deployment.apps "react-app" deleted

replicaset.apps "react-app-7784b4c7" deleted