

Kubernetes Reddit clone using Minikube

Objective: To deploy a Reddit clone web application by integrating it using tools like GitHub, Docker, DockerHub and deploying it using Kubernetes

Prerequisites: Two EC2 instances, where one will be utilized for Docker containerization and the other for deployment using Kubernetes

GitHub repository used in the project: <https://github.com/BineethSharma/Kubernetes-reddit-app-clone.git>

Step 1: Installing Docker in the first EC2 instance (These commands will install docker and add docker to the user group)

```
sudo apt-get update
```

```
sudo apt-get install docker.io -y
```

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

Step 2: Copy the source code repository and clone it:

<https://github.com/BineethSharma/reddit-clone-k8s-ingress.git>

Step 3: Create the Dockerfile:

```
FROM node:19-alpine3.15
```

```
WORKDIR /reddit-clone
```

```
COPY . /reddit-clone
```

```
RUN npm install
```

```
EXPOSE 3000
```

CMD ["npm","run","dev"]

Step 4: Build the dockerfile using the following command:

docker build -t <Imagename>

```
ubuntu@ip-172-31-62-224:~/reddit-clone-k8s-ingress$ docker build . -t redditclone
DEPRECATED: The legacy builder is deprecated and will be removed in a future release.
             Install the buildx component to build images with BuildKit:
             https://docs.docker.com/go/buildx/

Sending build context to Docker daemon  4.031MB
Step 1/6 : FROM node:19-alpine3.15
19-alpine3.15: Pulling from library/node
9621f1afde84: Pull complete
79ef350afea0: Pull complete
d3ad581b5912: Pull complete
ee1cc07adb60: Pull complete
Digest: sha256:12d9c7253f232bb88a9ef6d6e974afd90e296cb8383572dbb7f28c39f828b07e
Status: Downloaded newer image for node:19-alpine3.15
--> e5f532dbeb15
Step 2/6 : WORKDIR /reddit-clone
--> Running in fad52ee89101
Removing intermediate container fad52ee89101
```

i-0787cb6185ee2cd68 (docker server)

Step 5: Push the image to dockerhub (Containers Registry):

docker login

docker build -t redditclone:latest .

docker tag redditclone:latest your_dockerhub_username/redditclone:latest

docker push your_dockerhub_username/redditclone:latest

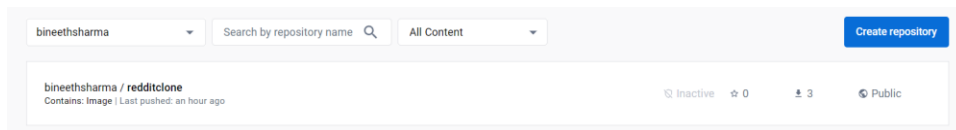
```
ubuntu@ip-172-31-62-224:~/reddit-clone-k8s-ingress$ docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one.
Username: bineethsharma
Password:
WARNING! Your password will be stored unencrypted in /home/ubuntu/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
ubuntu@ip-172-31-62-224:~/reddit-clone-k8s-ingress$
```

i-0787cb6185ee2cd68 (docker server)

```
ubuntu@ip-172-31-62-224:~/reddit-clone-k8s-ingress$ docker push bineethsharma/redditclone:latest
The push refers to repository [docker.io/bineethsharma/redditclone]
2029e394bb79: Pushed
e2c4eb1be34d: Pushed
3408923d37c9: Pushed
d978480c55fb2: Mounted from library/node
56b9297alb86: Mounted from library/node
df158e75fd32: Mounted from library/node
34d5ebaa5410: Mounted from library/node
latest: digest: sha256:350caeeelabeb8a80994f529281136593c3c46164af2f1d53f24364911b7ecd8 size: 1789
ubuntu@ip-172-31-62-224:~/reddit-clone-k8s-ingress$
```

i-0787cb6185ee2cd68 (docker server)



Note: Add the credentials like username and password of your dockerhub to login and push the image

Step 6: Install docker and minikube in the second server

For Docker Installation

```
sudo apt-get update
```

```
sudo apt-get install docker.io -y
```

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

For Minikube & Kubectl

```
curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
```

```
sudo install minikube-linux-amd64 /usr/local/bin/minikube
```

```
sudo snap install kubectl --classic
```

```
minikube start --driver=docker
```

Step 7: Creating the deployment.yml file:

```
apiVersion: apps/v1
```

```
kind: Deployment
```

```
metadata:
```

```
  name: reddit-clone-deployment
```

```
  labels:
```

```
    app: redditclone
```

```
spec:
```

```
replicas: 2
selector:
  matchLabels:
    app: redditclone
template:
  metadata:
    labels:
      app: redditclone
spec:
  containers:
  - name: redditclone
    image: bineethsharma/redditclone
    ports:
    - containerPort: 3000
```

Step 8: Applying the deployment.yml file:

```
kubectl apply -f deployment.yml
```

Step 9: To check if the replicas are ready:

```
kubectl get deployment
```

```
ubuntu@ip-172-31-63-44:~/kubernetes$ kubectl apply -f Deployment.yml
deployment.apps/reddit-clone-deployment created
ubuntu@ip-172-31-63-44:~/kubernetes$ kubectl get deployment
NAME                    READY    UP-TO-DATE    AVAILABLE    AGE
reddit-clone-deployment 0/2      2             0            29s
```

Step 10: Create the service.yml file:

```
apiVersion: v1
```

```
kind: Service
metadata:
  name: reddit-clone-service
labels:
  app: redditclone
spec:
  type: NodePort
  ports:
    - port: 3000
      targetPort: 3000
      nodePort: 31000
  selector:
    app: redditclone
```

Step 11: Applying the service.yml file:

```
kubectl apply -f deployment.yml
```

Step 12: Accessing the application using minikube:

```
minikube service reddit-clone-service --url
```

Step 13: Exposing the deployment and app service to access on the browser:

```
kubectl expose deployment reddit-clone-deployment --type=NodePort
```

```
kubectl port-forward svc/reddit-clone-service 3000:3000 --address 0.0.0.0 &
```

Step 14: Adding port 3000 in the security group of second(kubernetes) server:

Custom TCP

TCP

3000

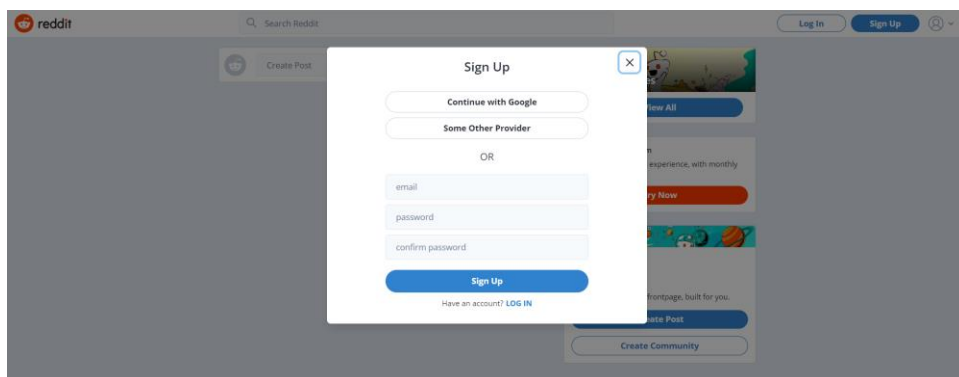
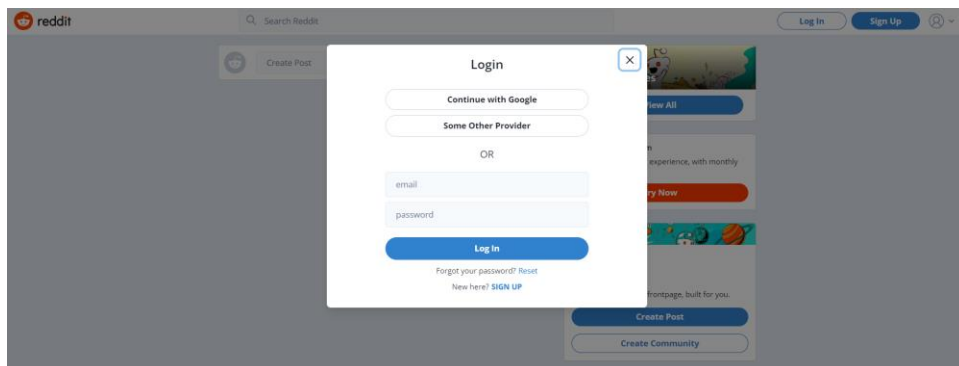
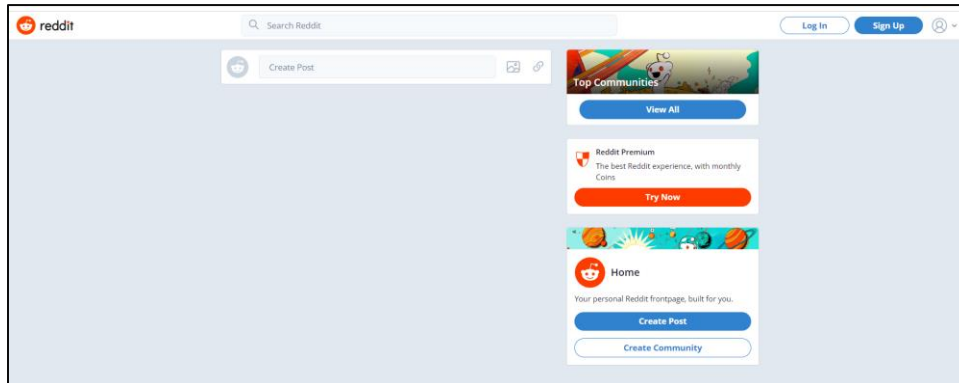
Anyw...

0.0.0.0

X

Delete

Step 15: Accessing the app in the browser:



Step 16: Enabling ingress:

minikube addons enable ingress

Step 17: Creating ingress.yml file:

apiVersion: networking.k8s.io/v1

kind: Ingress

metadata:

name: ingress-reddit-app

spec:

rules:

- host: "domain.com"

http:

paths:

- pathType: Prefix

path: "/test"

backend:

service:

name: reddit-clone-service

port:

number: 3000

- host: "*.domain.com"

http:

paths:

- pathType: Prefix

path: "/test"

backend:

service:

name: reddit-clone-service

port:

number: 3000

Step 18: Applying and accessing the ingress.yml file:

```
curl -L domain.com/test
```