

TASK - 4:

Objective: Deploy simple web application in k8s and expose with NodePort service. (tools: k8s, ubuntu vm)

STEP 1: Check whether Kubernetes and Docker are installed in Ubuntu

- ❖ **kubectl version --client**
- ❖ **minikube version**
- ❖ **docker --version**

STEP 2: Start minikube

- ❖ **minikube start --driver=docker**
- ❖ The above command won't work if we are a root user so switch to normal user using **exit** command.

STEP 3: Create a Deployment named webapp using nginx image

- ❖ **kubectl create deployment webapp --image=nginx --port=80**

STEP 4: Expose the Deployment as a NodePort Service

- ❖ **kubectl expose deployment webapp --type=NodePort --port=80 --target-port=80**

STEP 5: Verify the Deployment

- ❖ **kubectl get pod**
- ❖ **kubectl get svc**

STEP 6: Access the Web Application

- ❖ **minikube service webapp**

STEP 7: Monitor Pod and Logs

- ❖ **watch kubectl get pod**
- ❖ **watch kubectl logs webapp-869b64d6d9f-fb5xx**

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Activities Terminal Mar 19 18:36
root@ubuntu1: /home/vboxuser

root@ubuntu1: /home/vboxuser# kubectl create deployment webapp --image=nginx --port=80
error: failed to create deployment: deployments.apps "webapp" already exists
root@ubuntu1: /home/vboxuser# kubectl expose deployment webapp --type=NodePort --port=80 --target
error: unknown flag: --target
See 'kubectl expose --help' for usage.
root@ubuntu1: /home/vboxuser# kubectl expose deployment webapp --type=NodePort --port=80 --target-port=
80
service/webapp exposed
root@ubuntu1: /home/vboxuser# kubectl get pod
NAME                                READY   STATUS    RESTARTS   AGE
my-deploy-74b6755685-84bft         1/1     Running   0           11h
my-deploy-74b6755685-d6tx2         1/1     Running   0           11h
nginx-deploy-5c477b75b8-7s6lt      1/1     Running   0           6h23m
react-ecommerce-deployment-849768b4c6-6qxrff 1/1     Running   0           3h15m
react-ecommerce-deployment-849768b4c6-stfvv 1/1     Running   0           3h15m
webapp-869b646d9f-fb5xx            0/1     ImagePullBackOff 0           10m
root@ubuntu1: /home/vboxuser# kubectl get svc
NAME      TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
kubernetes  ClusterIP  10.96.0.1    <none>        443/TCP          12h
nginx-deploy  NodePort   10.106.32.22 <none>        80:31495/TCP     6h22m
react-ecommerce-service  NodePort   10.101.15.51 <none>        80:30007/TCP     160m
webapp      NodePort   10.98.87.194 <none>        80:30613/TCP     22s
root@ubuntu1: /home/vboxuser# minikube service webapp
|-----|
| NAMESPACE | NAME | TARGET PORT | URL |
|-----|
| default | webapp | 80 | http://192.168.49.2:30613 |
|-----|
```

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Activities Terminal Mar 19 18:37
root@ubuntu1: /home/vboxuser

root@ubuntu1: /home/vboxuser# kubectl get pods -o wide
NAME                                NAMESPACE  NOMINATED NODE  READINESS GATES  READY   STATUS    RESTARTS   AGE   IP             NODE
my-deploy-74b6755685-84bft         kube-system  <none>          <none>            1/1     Running   0           11h   10.244.0.6     minik
my-deploy-74b6755685-d6tx2         kube-system  <none>          <none>            1/1     Running   0           11h   10.244.0.7     minik
nginx-deploy-5c477b75b8-7s6lt      kube-system  <none>          <none>            1/1     Running   0           6h29m 10.244.0.11    minik
react-ecommerce-deployment-849768b4c6-6qxrff kube-system  <none>          <none>            1/1     Running   0           3h21m 10.244.0.14    minik
react-ecommerce-deployment-849768b4c6-stfvv kube-system  <none>          <none>            1/1     Running   0           3h21m 10.244.0.15    minik
webapp-869b646d9f-fb5xx            kube-system  <none>          <none>            1/1     Running   0           16m   10.244.0.17    minik
root@ubuntu1: /home/vboxuser# kubectl get svc webapp -o yaml
apiVersion: v1
kind: Service
metadata:
  creationTimestamp: "2025-03-19T11:30:33Z"
  labels:
    app: webapp
    name: webapp
  namespace: default
  resourceVersion: "34915"
  uid: afd6ab8b-82fa-4724-9e32-c74410535646
spec:
  clusterIP: 10.98.87.194
  clusterIPs:
    - 10.98.87.194
  externalTrafficPolicy: Cluster
```

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Activities Terminal Mar 19 18:38
root@ubuntu1: /home/vboxuser

internalTrafficPolicy: Cluster
ipFamilies:
- IPv4
ipFamilyPolicy: SingleStack
ports:
- nodePort: 30613
  port: 80
  protocol: TCP
  targetPort: 80
selector:
  app: webapp
sessionAffinity: None
type: NodePort
status:
  loadBalancer: {}
root@ubuntu1:/home/vboxuser# kubectl get endpoints webapp
NAME      ENDPOINTS          AGE
webapp    10.244.0.17:80     8m36s
root@ubuntu1:/home/vboxuser# kubectl get pods --show-labels
NAME                                READY   STATUS    RESTARTS   AGE   LABELS
my-deploy-74b6755685-84bft         1/1     Running   0          11h   app=my-deploy,pod-t
emlate-hash=74b6755685
my-deploy-74b6755685-d6tx2         1/1     Running   0          11h   app=my-deploy,pod-t
emlate-hash=74b6755685
nginx-deploy-5c477b75b8-7s6lt      1/1     Running   0          6h32m app=nginx-deploy,po
d-template-hash=5c477b75b8
react-ecommerce-deployment-849768b4c6-6qxf 1/1     Running   0          3h23m app=react-ecommerce
,pod-template-hash=849768b4c6
react-ecommerce-deployment-849768b4c6-stfvv 1/1     Running   0          3h23m app=react-ecommerce
,pod-template-hash=849768b4c6
webapp-869b646d9f-fb5xx            1/1     Running   0          19m   app=webapp,pod-temp
late-hash=869b646d9f
```

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Activities Terminal Mar 19 18:41
root@ubuntu1: /home/vboxuser

Every 2.0s: kubectl get pod ubuntu1: Wed Mar 19 18:41:55 2025

NAME                                READY   STATUS    RESTARTS   AGE
my-deploy-74b6755685-84bft         1/1     Running   0          12h
my-deploy-74b6755685-d6tx2         1/1     Running   0          12h
nginx-deploy-5c477b75b8-7s6lt      1/1     Running   0          8h
react-ecommerce-deployment-849768b4c6-6qxf 1/1     Running   0          4h56m
react-ecommerce-deployment-849768b4c6-stfvv 1/1     Running   0          4h56m
webapp-869b646d9f-fb5xx            1/1     Running   0          11m
```

Activities Terminal Mar 19 18:42

root@ubuntu1: /home/vboxuser

root@ubuntu1: /home/vboxuser x root@ubuntu1: /home/vboxuser x

Every 2.0s: kubectl logs webapp-869b646d9f-fb5xx ubuntu1: Wed Mar 19 18:42:49 2025

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/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Sourcing /docker-entrypoint.d/15-local-resolvers.envsh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2025/03/19 11:34:38 [notice] 1#1: using the "epoll" event method
2025/03/19 11:34:38 [notice] 1#1: nginx/1.27.4
2025/03/19 11:34:38 [notice] 1#1: built by gcc 12.2.0 (Debian 12.2.0-14)
2025/03/19 11:34:38 [notice] 1#1: OS: Linux 5.15.0-43-generic
2025/03/19 11:34:38 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2025/03/19 11:34:38 [notice] 1#1: start worker processes
2025/03/19 11:34:38 [notice] 1#1: start worker process 30
2025/03/19 11:34:38 [notice] 1#1: start worker process 31
2025/03/19 11:34:38 [notice] 1#1: start worker process 32
2025/03/19 11:34:38 [notice] 1#1: start worker process 33
10.244.0.1 - - [19/Mar/2025:11:43:56 +0000] "GET / HTTP/1.1" 200 615 "-" "curl/7.81.0" "-"
10.244.0.1 - - [19/Mar/2025:11:46:11 +0000] "GET / HTTP/1.1" 200 615 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:136.0) Gecko/20100101 Firefox/136.0" "-"
2025/03/19 11:46:11 [error] 32#32: *2 open() "/usr/share/nginx/html/favicon.ico" failed (2: No such file or directory), client: 10.244.0.1, server: localhost, request: "GET /favicon.ico HTTP/1.1", host: "192.168.49.2:30613", referer: "http://192.168.49.2:30613/"
10.244.0.1 - - [19/Mar/2025:11:46:11 +0000] "GET /favicon.ico HTTP/1.1" 404 153 "http://192.168.49.2:30613/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:136.0) Gecko/20100101 Firefox/136.0" "-"
```

