

**TASK- 4: Objective : Deploy web application in the k8s and expose with Nodeport server  
(tools: k8s,ubuntu vm)**

**1. Start Minikube**

```
minikube start --force
```

- This starts a local Kubernetes cluster using Minikube.

**2. Create a Deployment**

```
kubectl create deployment webapp --image=nginx --port=80
```

- This creates a deployment named webapp using the nginx image.

**3. Expose the Deployment**

```
kubectl expose deployment webapp --type=NodePort --port=80
```

command had --image=nginx (not needed in kubectl expose).

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

**4. Check the Pods**

```
kubectl get pods
```

- If the status is ImagePullBackOff, it means Kubernetes cannot fetch the image.

**5. Debugging the ImagePullBackOff Error**

```
kubectl describe pod <webapp-pod-name>
```

**Possible reasons:**

- No internet access (fix by ensuring Minikube has network access)
- Private repository (fix by using kubectl create secret to provide credentials)

 **Fix: If you're using Minikube, pull the image manually:**

**6. Check Services**

```
kubectl get svc
```

```
kubectl get svc webapp -o yaml
```

```
kubectl get endpoints
```

If endpoints column is empty, it means no pod is running.

 Fix: Restart Minikube and reapply the deployment:

```
minikube start --force
```

```
kubectl delete deployment webapp
```

```
kubectl create deployment webapp --image=nginx --port=80
```

```
kubectl expose deployment webapp --type=NodePort --port=80
```

## 7. Check Pod Labels

```
kubectl get pods --show-labels
```

- This verifies the labels assigned to the pod.

## 8. Get Pod Details

```
kubectl describe pod webapp-869b646d9f-hxnpd
```

- Look for Events at the bottom to see why the image is failing.

## 9. Get the Webapp URL

```
minikube service webapp --url
```

 Fix: If service is unreachable, restart Minikube and try again.

## 10. Open the Webapp

- CTRL + Click the URL
- You should see the Welcome to Nginx page.

```
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root@ubuntu:/home/vboxuser

vboxuser@ubuntu: $ su
Password:
root@ubuntu:/home/vboxuser# kubectl create deployment webapp --image=nginx --port=80
error: failed to create deployment: Post "https://192.168.49.2:8443/apis/apps/v1/namespaces/default/deployments?fieldManager=kubectl-create&fieldValidation=Strict": dial tcp 192.168.49.2:8443: connect: no route to host
root@ubuntu:/home/vboxuser# minikube start --force
minikube v1.35.0 on Ubuntu 22.04 (vbox/amd64)
minikube skips various validations when --force is supplied; this may lead to unexpected behavior
Using the docker driver based on existing profile
The "docker" driver should not be used with root privileges. If you wish to continue as root, use --force.
If you are running minikube within a VM, consider using --driver=none:
  https://minikube.sigs.k8s.io/docs/reference/drivers/none/
Tip: To remove this root owned cluster, run: sudo minikube delete

Requesting memory allocation 1968MB is more than your system limit 1966MB.
Suggestion: Start minikube with less memory allocated: 'minikube start --memory=1966mb'

💡 The requested memory allocation of 1968MiB does not leave room for system overhead (total system memory: 1966MiB). You may face stability issues.
Suggestion: Start minikube with less memory allocated: 'minikube start --memory=1966mb'

Starting "minikube" primary control-plane node in "minikube" cluster
Pulling base image v0.0.46 ...
Restarting existing docker container for "minikube" ...
Preparing Kubernetes v1.32.0 on Docker 27.4.1 ...
Verifying Kubernetes components...
  ■ Using image gcr.io/k8s-minikube/storage-provisioner:v5
  ■ Enabled addons: storage-provisioner, default-storageclass
Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
root@ubuntu:/home/vboxuser# kubectl create deployment webapp --image=nginx --port=80
error: failed to create deployment: deployments.apps "webapp" already exists
root@ubuntu:/home/vboxuser# kubectl expose deployment webapp --type=NodePort --port=80 --target-port=80
Error from server (AlreadyExists): services "webapp" already exists
root@ubuntu:/home/vboxuser# kubectl get pod
NAME          READY   STATUS    RESTARTS   AGE
react-e-commerce-deployment-849768b4c6-lng2w  1/1     Running   2          19h
react-e-commerce-deployment-849768b4c6-mv5fq  1/1     Running   2          19h
webapp-869b646d9f-hxnpd           0/1     ImagePullBackOff  0          23m
root@ubuntu:/home/vboxuser# kubectl get svc
```

```
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webapp-869b646d9f-hxnpd           0/1     ImagePullBackOff  0          23m
root@ubuntu:/home/vboxuser# kubectl get svc
NAME          TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP  10.96.0.1   <none>        443/TCP   42h
react-e-commerce-service  NodePort   10.98.197.180 <none>        80:30007/TCP 19h
webapp       NodePort   10.108.211.67 <none>        80:32093/TCP 20m
root@ubuntu:/home/vboxuser# minikube service webapp
  Executing "docker container inspect minikube --format='{{.State.Status}}'" took an unusually long time: 2.365024388s
  ⚠️ Restarting the docker service may improve performance.
  ┌─────────┐ ┌─────────┐ ┌─────────┐ ┌─────────┐
  | NAMESPAC ┌─| NAME ┌─| TARGET PORT ┌─| URL ┌─|
  └─────────┘ └─────────┘ └─────────┘ └─────────┘
  | default  | webapp | 80 | http://192.168.49.2:32093 |
```

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```
Preparing Kubernetes v1.52.0 on Docker 27.4.1 ...
  Verifying Kubernetes components...
    ■ Using image gcr.io/k8s-minikube/storage-provisioner:v5
  Enabled addons: storage-provisioner, default-storageclass
  Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
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error: failed to create deployment: deployments.apps "webapp" already exists
root@ubuntu:/home/vboxuser# kubectl expose deployment webapp --type=NodePort --port=80 --target-port=80
Error from server (AlreadyExists): services "webapp" already exists
root@ubuntu:/home/vboxuser# kubectl get pod
NAME          READY   STATUS    RESTARTS   AGE
react-commerce-deployment-849768b4c6-lng2w  1/1   Running   2          19h
react-commerce-deployment-849768b4c6-mv5fq  1/1   Running   2          19h
webapp-869b646d9f-hxnpd                   0/1   ImagePullBackOff  0          23m
root@ubuntu:/home/vboxuser# kubectl get svc
NAME           TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes     ClusterIP  10.96.0.1   <none>        443/TCP   42h
react-commerce-service  NodePort   10.98.197.180 <none>        80:30007/TCP 19h
webapp         NodePort   10.108.211.67 <none>        80:32093/TCP 20m
root@ubuntu:/home/vboxuser# minikube service webapp
  Executing "docker container inspect minikube --format='{{.State.Status}}'" took an unusually long time: 2.365024388s
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|-----|-----|-----|
| NAMESPACE | NAME | TARGET PORT | URL |
|-----|-----|-----|
| default | webapp | 80 | http://192.168.49.2:32093 |
|-----|-----|-----|
✖ Exiting due to SVC_UNREACHABLE: service not available: no running pod for service webapp found
```

If the above advice does not help, please let us know:  
<https://github.com/kubernetes/minikube/issues/new/choose>

Please run `minikube logs --file=logs.txt` and attach logs.txt to the GitHub issue.  
Please also attach the following file to the GitHub issue:  
- /tmp/minikube\_service\_ace32668c4e33dd4b6d3c362c4edb80891e189b5\_0.log

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```
|-----|-----|-----|
| default | webapp | 80 | http://192.168.49.2:32093 |
|-----|-----|-----|
✖ Exiting due to SVC_UNREACHABLE: service not available: no running pod for service webapp found
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- /tmp/minikube\_service\_ace32668c4e33dd4b6d3c362c4edb80891e189b5\_0.log

```
root@ubuntu:/home/vboxuser# kubectl get pods -o wide
NAME          READY   STATUS    RESTARTS   AGE   IP           NODE   NOMINATED NODE
READINESS GATES
react-commerce-deployment-849768b4c6-lng2w  1/1   Running   2          19h  10.244.0.15  minikube  <none>
<none>
react-commerce-deployment-849768b4c6-mv5fq  1/1   Running   2          19h  10.244.0.16  minikube  <none>
<none>
webapp-869b646d9f-hxnpd                   0/1   ImagePullBackOff  0          27m  10.244.0.14  minikube  <none>
<none>
root@ubuntu:/home/vboxuser# kubectl get svc webapp -o yaml
apiVersion: v1
kind: Service
metadata:
  creationTimestamp: "2025-03-21T04:31:46Z"
  labels:
    app: webapp
    name: webapp
    namespace: default
    resourceVersion: "2985"
    uid: 643039a8-480f-48d6-b2b9-784cec2be885
spec:
  clusterIP: 10.108.211.67
  clusterIPs:
    - 10.108.211.67
```

```
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clusterIP: 10.108.211.67
clusterIPs:
- 10.108.211.67
externalTrafficPolicy: Cluster
internalTrafficPolicy: Cluster
ipFamilies:
- IPv4
ipFamilyPolicy: SingleStack
ports:
- nodePort: 32093
  port: 80
  protocol: TCP
  targetPort: 80
selector:
  app: webapp
  sessionAffinity: None
  type: NodePort
status:
  loadBalancer: {}

root@ubuntu:/home/vboxuser# kubectl get endpoints webapp
NAME      ENDPOINTS   AGE
webapp    25m

root@ubuntu:/home/vboxuser# kubectl get pods --show-labels
NAME          READY   STATUS    RESTARTS   AGE   LABELS
react-ecommerce-deployment-849768b4c6-lng2w  1/1    Running   2          19h   app=react-ecommerce,pod-template-hash=849768b4c6
react-ecommerce-deployment-849768b4c6-mv5fq  1/1    Running   2          19h   app=react-ecommerce,pod-template-hash=849768b4c6
webapp-869b646d9f-hxnpd           0/1    ImagePullBackOff  0          31m   app=webapp,pod-template-hash=869b646d9f

root@ubuntu:/home/vboxuser# kubectl describe pod webapp-869b646d9f-hxnpd
Name:           webapp-869b646d9f-hxnpd
Namespace:      default
Priority:       0
Service Account: default
Node:          minikube/192.168.49.2
Start Time:     Fri, 21 Mar 2025 09:58:12 +0530
Labels:         app=webapp
               pod-template-hash=869b646d9f
Annotations:    <none>
Status:        Running
```

```
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Node:          minikube/192.168.49.2
Start Time:    Fri, 21 Mar 2025 09:58:12 +0530
Labels:        app=webapp
               pod-template-hash=869b646d9f
Annotations:   <none>
Status:        Running
IP:           10.244.0.14
IPs:
  IP:          10.244.0.14
Controlled By: ReplicaSet/webapp-869b646d9f
Containers:
  nginx:
    Container ID: docker://a47e1ec85f7278bfc068247b2c0772b3a08cf46c197240ad0ba20666764a8305
    Image:         nginx
    Image ID:    docker-pullable://nginx@sha256:124b44bfc9ccdf1f3cedf4b592d4d1e8bddb78b51ec2ed5056c52d3692baebc19
    Port:         80/TCP
    Host Port:   0/TCP
    State:        Running
      Started:   Fri, 21 Mar 2025 10:32:33 +0530
    Ready:        True
    Restart Count: 0
    Environment:  <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-47ld2 (ro)
Conditions:
  Type            Status
  PodReadyToStartContainers  True
  Initialized     True
  Ready           True
  ContainersReady True
  PodScheduled    True
Volumes:
  kube-api-access-47ld2:
    Type:          Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds: 3607
    ConfigMapName:   kube-root-ca.crt
    ConfigMapOptional: <n/a>
    DownwardAPI:    true
    QoS Class:     BestEffort
    Node-Selectors: <none>
```

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```
TokenExpirationSeconds: 3607
ConfigMapName: kube-root-ca.crt
ConfigMapOptional: <nil>
DownwardAPI: true
QoS Class: BestEffort
Node-Selectors: <none>
Tolerations: node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
node.kubernetes.io/unreachable:NoExecute op=Exists for 300s

Events:
Type Reason Age From Message
---- ---- - - - -
Normal Scheduled 41m default-scheduler Successfully assigned default/webapp-869b646d9f-hxnpd to minikube
Warning Failed 40m kubelet Failed to pull image "nginx": Error response from daemon: Get "http://registry-1.docker.io/v2/": dial tcp: lookup registry-1.docker.io on 192.168.49.1:53: server mlsbehaving
Warning Failed 40m kubelet Error: ErrImagePull
Normal SandboxChanged 40m kubelet Pod sandbox changed, it will be killed and re-created.
Normal Pulling 40m (x2 over 41m) kubelet Pulling image "nginx"
Normal SandboxChanged 22m kubelet Pod sandbox changed, it will be killed and re-created.
Warning Failed 21m kubelet Error: ErrImagePull
Warning Failed 21m kubelet Failed to pull image "nginx": Error response from daemon: Get "http://registry-1.docker.io/v2/": net/http: TLS handshake timeout
Normal BackOff 21m kubelet Back-off pulling image "nginx"
Warning Failed 21m kubelet Error: ImagePullBackOff
Normal Pulling 20m (x2 over 21m) kubelet Pulling image "nginx"
Normal Pulled 7m36s kubelet Successfully pulled image "nginx" in 13m9.834s (13m9.834s including waiting). Image size: 192004242 bytes.
Normal Created 7m32s kubelet Created container: nginx
Normal Started 7m23s kubelet Started container nginx
root@ubuntu:/home/vboxuser# kubectl get pods
NAME READY STATUS RESTARTS AGE
react-commerce-deployment-849768b4c6-lng2w 1/1 Running 2 19h
react-commerce-deployment-849768b4c6-mv5fq 1/1 Running 2 19h
webapp-869b646d9f-hxnpd 1/1 Running 0 45m
root@ubuntu:/home/vboxuser# kubectl expose deployment webapp --type=NodePort --port=80 --target-port=80
Error from server (AlreadyExists): services "webapp" already exists
root@ubuntu:/home/vboxuser# minikube service webapp --url
Executing "docker container inspect minikube --format={{.State.Status}}" took an unusually long time: 8.624343932s
└─ Restarting the docker service may improve performance.
http://192.168.49.2:32093
root@ubuntu:/home/vboxuser#
```

