

Task 5: Deploy and Manage NGINX in Kubernetes using Minikube

Tools Used

- Minikube (for running a local Kubernetes cluster)
- kubectl (Kubernetes CLI tool)
- Docker (optional, if using custom images)
- macOS Terminal

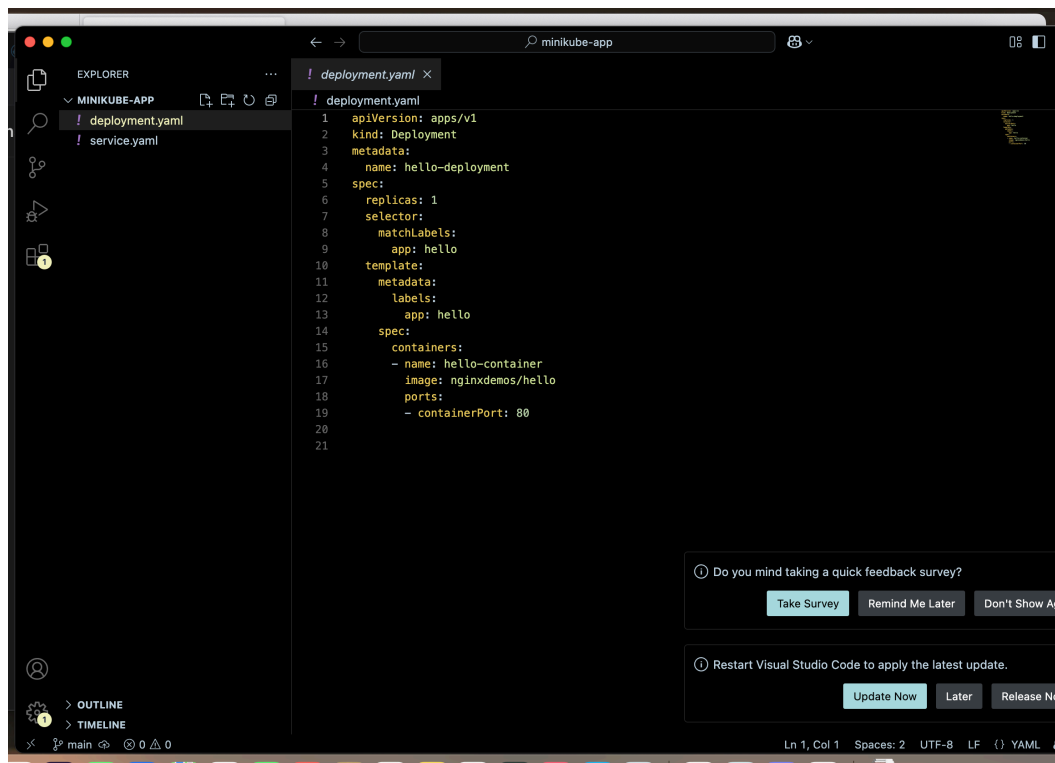
Steps Performed

Step 1: Install & Start Minikube

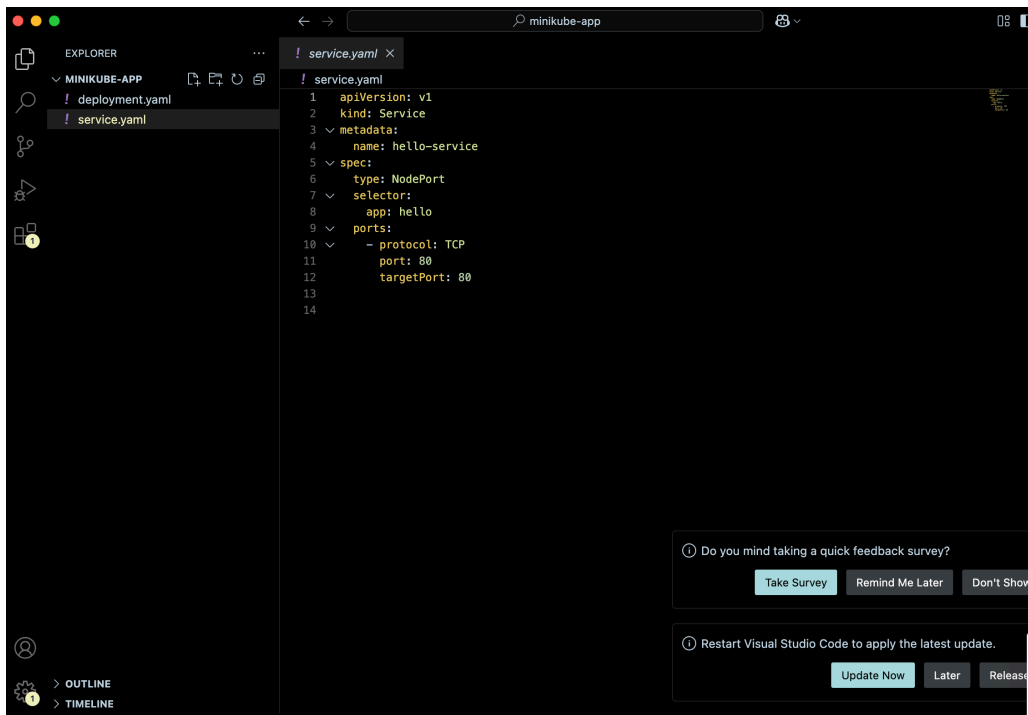
brew install minikube

minikube start

Step 2: Create deployment.yaml



Step 3: Create service.yaml



Step 4: Deploy Resources to Kubernetes

kubectl apply -f deployment.yaml

kubectl apply -f service.yaml

Step 5: Verify the Deployment

kubectl get pods

kubectl get svc

```

192.168.49.2
macbookair@MACBOOKS-MacBook-Air minikube-app % minikube ip

192.168.49.2
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %
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macbookair@MACBOOKS-MacBook-Air minikube-app % kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
hello-deployment-7764b8446c-nvpr8   1/1     Running   0           106m
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app % kubectl get svc
NAME      TYPE          CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
hello-service  NodePort      10.103.49.240 <none>        80:30186/TCP    105m
kubernetes  ClusterIP     10.96.0.1     <none>        443/TCP          110m
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %
macbookair@MACBOOKS-MacBook-Air minikube-app %

```

Step 6: Access the Application

1. **Get the Minikube IP:**
2. **minikube ip**
3. **Get the NodePort assigned to the NGINX service:**
4. **kubectl get svc**
5. **Open in browser:**
6. **http://<minikube-ip>:<node-port>**

Step 7: Scale the Deployment

kubectl scale deployment nginx-deployment --replicas=4

kubectl get pods

```
macbookair@MACBOOKS-MacBook-Air minikube-app % kubectl get deployments
```

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
hello-deployment	1/1	1	1	11m

```
macbookair@MACBOOKS-MacBook-Air minikube-app % kubectl scale deployment nginx-deployment --replicas=4

error: no objects passed to scale deployments.apps "nginx-deployment" not found
macbookair@MACBOOKS-MacBook-Air minikube-app % kubectl scale deployment hello-deployment --replicas=4

deployment.apps/hello-deployment scaled
macbookair@MACBOOKS-MacBook-Air minikube-app % ls
deployment.yaml service.yaml
macbookair@MACBOOKS-MacBook-Air minikube-app % kubectl get pods
```

NAME	READY	STATUS	RESTARTS	AGE
hello-deployment-7764b8446c-29qqg	1/1	Running	0	12s
hello-deployment-7764b8446c-4fwcb	1/1	Running	0	12s
hello-deployment-7764b8446c-nvpr8	1/1	Running	0	12m
hello-deployment-7764b8446c-zqk6s	1/1	Running	0	12s

```
macbookair@MACBOOKS-MacBook-Air minikube-app % kubectl get pods
```

Step 8: View Pod Logs or Details

kubectl describe pod hello-deployment-7764b8446c-29qqg

```

kubernetes      ClusterIP  10.96.0.1      <none>         443/TCP        17m
macbookair@MACBOOKS-MacBook-Air minikube-app % kubectl describe pod hello-deployment-7764b8446c-29qqg

Name:           hello-deployment-7764b8446c-29qqg
Namespace:      default
Priority:        0
Service Account: default
Node:           minikube/192.168.49.2
Start Time:     Mon, 14 Apr 2025 17:57:00 +0530
Labels:         app=hello
                pod-template-hash=7764b8446c
Annotations:    <none>
Status:         Running
IP:             10.244.0.6
IPs:
  IP:           10.244.0.6
Controlled By:  ReplicaSet/hello-deployment-7764b8446c
Containers:
  hello-container:
    Container ID:  docker://5ddfe46dbca4e0bab7d0b00dad7232013099fb40fefba72d4cd67f037acf932d
    Image:         nginxdemos/hello
    Image ID:      docker-pullable://nginxdemos/hello@sha256:2293656951429d36b788d1285a97bd2a862428759802444450257760790423f6
    Port:         80/TCP
    Host Port:    0/TCP
    State:        Running
      Started:    Mon, 14 Apr 2025 17:57:07 +0530
    Ready:        True
    Restart Count: 0
    Environment:  <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-zr86m (ro)
Conditions:
  Type                               Status
  PodReadyToStartContainers         True
  Initialized                        True
  Ready                             True
  ContainersReady                   True
  PodScheduled                       True

```

Deliverables

- deployment.yaml
- service.yaml