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Kubernetes Deployment Guide

Introduction

This document outlines the process for deploying a sample application using Kubernetes. The steps include configuring a Deployment and a Service, applying them with kubectl, and accessing the deployed service via Minikube.

UNIX/Linux Commands

cat

- Purpose: Displays the contents of files.

Usage Example:

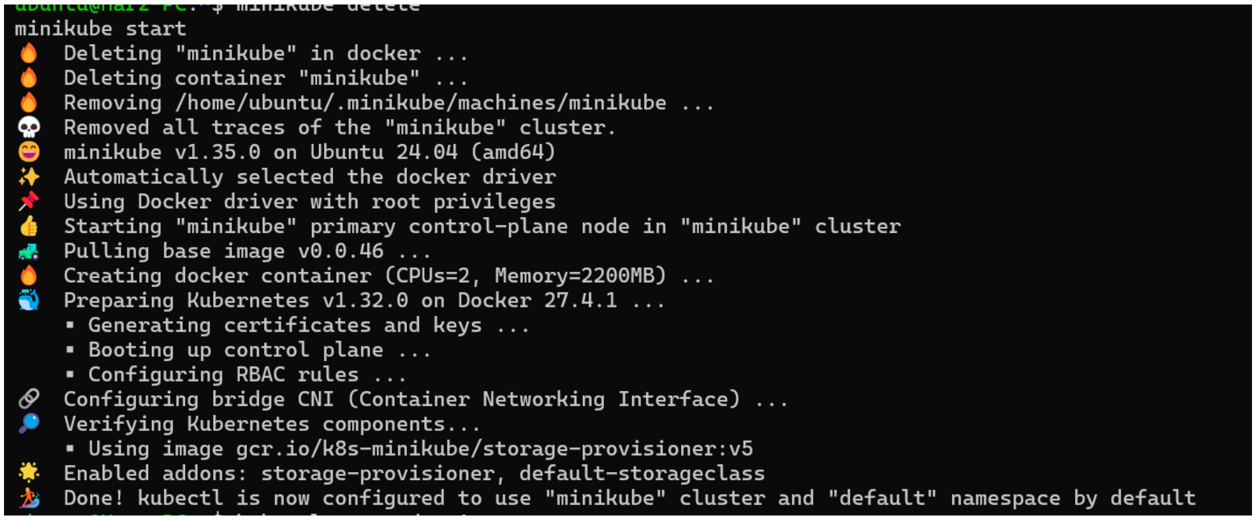
```
cat filename.txt
```

vim

- Purpose: Opens the Vim text editor, a powerful tool for editing files in UNIX/Linux.

Usage Example:

```
vim filename.txt
```



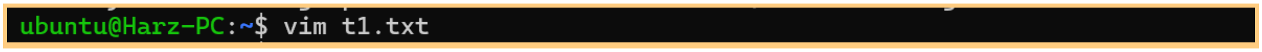
```
minikube start
🔥  Deleting "minikube" in docker ...
🔥  Deleting container "minikube" ...
🔥  Removing /home/ubuntu/.minikube/machines/minikube ...
💀  Removed all traces of the "minikube" cluster.
😄  minikube v1.35.0 on Ubuntu 24.04 (amd64)
✨  Automatically selected the docker driver
📌  Using Docker driver with root privileges
👍  Starting "minikube" primary control-plane node in "minikube" cluster
🚜  Pulling base image v0.0.46 ...
🔥  Creating docker container (CPUs=2, Memory=2200MB) ...
🐳  Preparing Kubernetes v1.32.0 on Docker 27.4.1 ...
    ▪ Generating certificates and keys ...
    ▪ Booting up control plane ...
    ▪ Configuring RBAC rules ...
🔗  Configuring bridge CNI (Container Networking Interface) ...
🔎  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
```

Kubernetes Deployment Steps

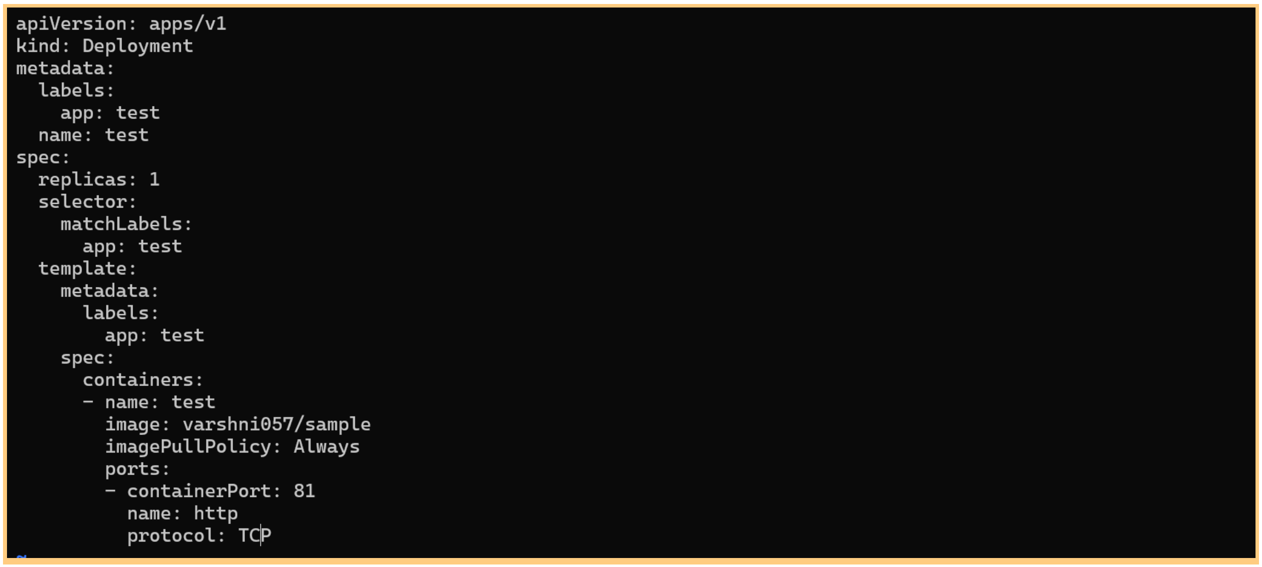
1. Apply Deployment Configuration

Execute the following command to apply the Deployment configuration and create the deployment named test:

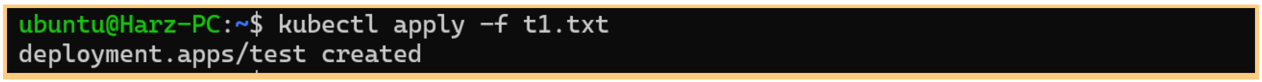
kubectl apply -f t1.txt



```
ubuntu@Harz-PC:~$ vim t1.txt
```



```
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    app: test
  name: test
spec:
  replicas: 1
  selector:
    matchLabels:
      app: test
  template:
    metadata:
      labels:
        app: test
    spec:
      containers:
      - name: test
        image: varshni057/sample
        imagePullPolicy: Always
        ports:
        - containerPort: 81
          name: http
          protocol: TCP
```

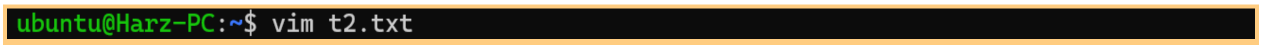


```
ubuntu@Harz-PC:~$ kubectl apply -f t1.txt
deployment.apps/test created
```

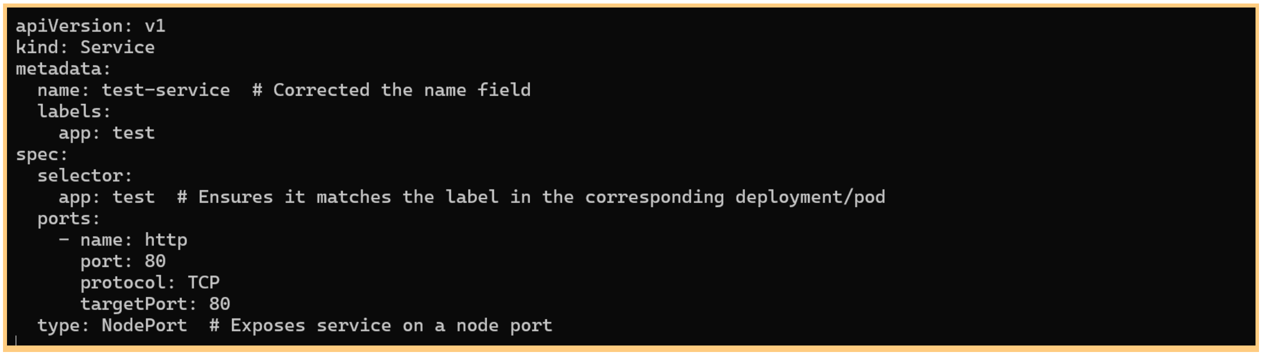
2. Apply Service Configuration

Run this command to create the service named test-service:

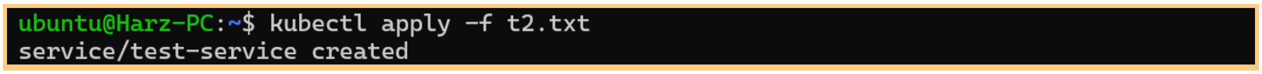
kubectl apply -f t2.txt



```
ubuntu@Harz-PC:~$ vim t2.txt
```



```
apiVersion: v1
kind: Service
metadata:
  name: test-service  # Corrected the name field
  labels:
    app: test
spec:
  selector:
    app: test  # Ensures it matches the label in the corresponding deployment/pod
  ports:
    - name: http
      port: 80
      protocol: TCP
      targetPort: 80
  type: NodePort  # Exposes service on a node port
```

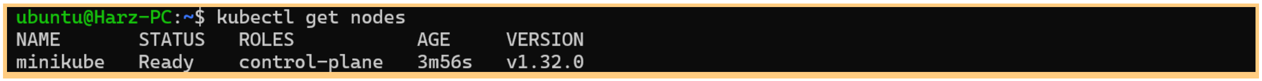


```
ubuntu@Harz-PC:~$ kubectl apply -f t2.txt
service/test-service created
```

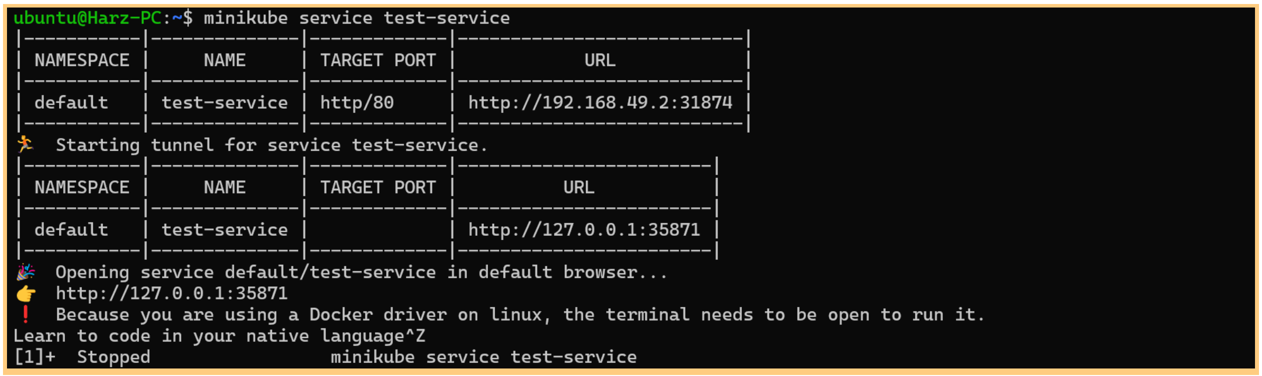
3. Access the Service

Use the following command to start a tunnel for the service and obtain a URL for accessing the deployed application:

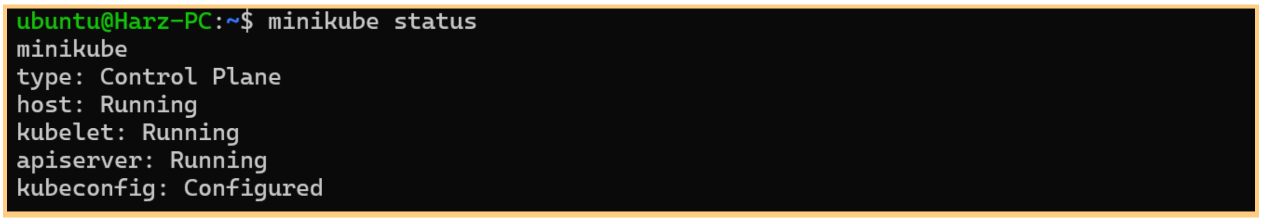
minikube service test-service



```
ubuntu@Harz-PC:~$ kubectl get nodes
NAME       STATUS   ROLES           AGE     VERSION
minikube   Ready    control-plane   3m56s   v1.32.0
```

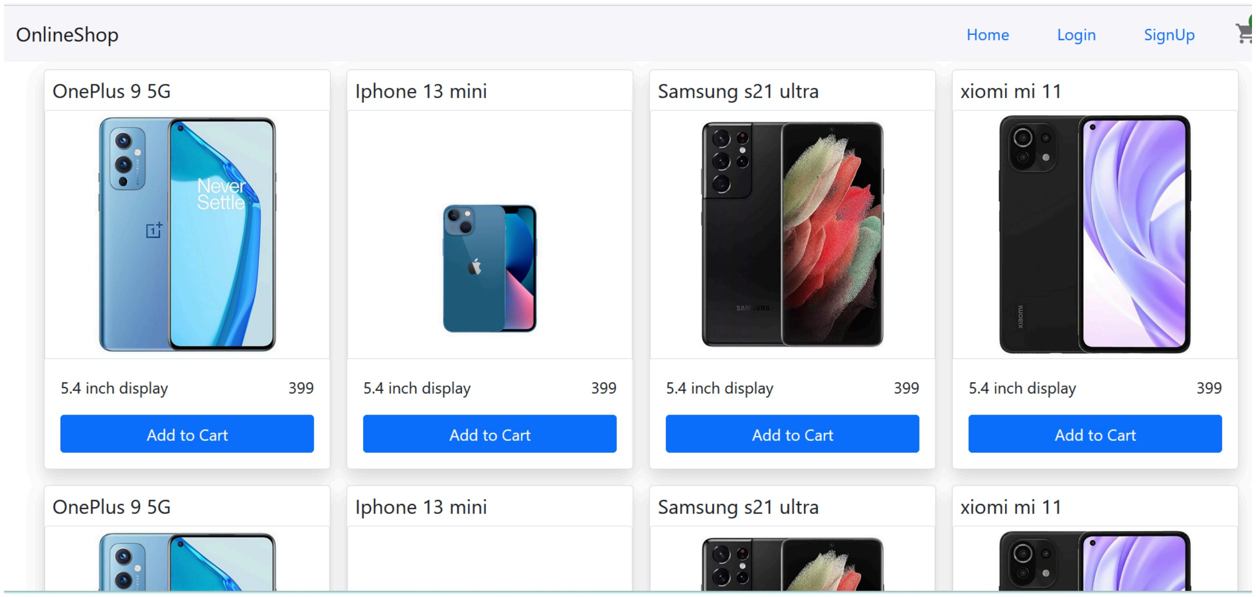


```
ubuntu@Harz-PC:~$ minikube service test-service
|-----------|--------------|-------------|---------------------------|
| NAMESPACE |     NAME     | TARGET PORT |            URL            |
|-----------|--------------|-------------|---------------------------|
| default   | test-service | http/80     | http://192.168.49.2:31874 |
|-----------|--------------|-------------|---------------------------|
🏃  Starting tunnel for service test-service.
|-----------|--------------|-------------|------------------------|
| NAMESPACE |     NAME     | TARGET PORT |          URL           |
|-----------|--------------|-------------|------------------------|
| default   | test-service |             | http://127.0.0.1:35871 |
|-----------|--------------|-------------|------------------------|
🎉  Opening service default/test-service in default browser...
👉  http://127.0.0.1:35871
❗  Because you are using a Docker driver on linux, the terminal needs to be open to run it.
Learn to code in your native language^Z
[1]+  Stopped                 minikube service test-service
```



```
ubuntu@Harz-PC:~$ minikube status
minikube
type: Control Plane
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured
```

Output



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