8. Deploy Your Application on Kubernetes

We will take the **my-nginx-app** image you built in Experiment 7 and deploy it to your Minikube cluster.

Step 1: Install kubectl

kubectl is the command-line tool you use to talk to your Kubernetes cluster.

1. **Download the latest stable release:**

Bash

```
curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"
```

2. **Install kubectl** (make it executable and move it to your path):

Bash

```
sudo install -o root -g root -m 0755 kubectl /usr/local/bin/kubectl
```

3. **Verify the installation:**

Bash

```
kubectl version --client
```

Step 2: Install and Start Minikube

Minikube will create and run the actual Kubernetes cluster.

1. **Download and install Minikube:**

Bash

```
curl -Lo minikube https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
sudo install minikube /usr/local/bin/
```

2. **Start your cluster:** This command tells Minikube to create a new cluster using the Docker driver you already have installed.

Bash

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

This may take a few minutes as it downloads the Kubernetes components.

Step 3: Load Your Local Image into Minikube

This is a **critical step**. Your Kubernetes cluster (Minikube) runs inside its own Docker environment, so it cannot "see" the my-nginx-app image you built earlier. This command loads your image into the cluster.

Bash

```
minikube image load my-nginx-app
```

Step 4: Create a Kubernetes Deployment File

kubectl create deployment my-nginx-deployment --image=my-nginx-app

kubectl patch deployment my-nginx-deployment --type='json' -p='[{"op": "replace", "path": "/spec/template/spec/containers/0/imagePullPolicy", "value":"IfNotPresent"}]'

kubectl expose deployment my-nginx-deployment --type=NodePort --port=80

Step 6: Check the Status

Let's see your application running!

1. **Check the Pods:** (A **Pod** is the smallest unit in Kubernetes, which holds your container).

Bash

```
kubectl get pods
```

Wait a few seconds and run it again. You should see two `my-nginx-deployment` pods with a status of `Running`.

2. **Check the Service:** This shows your networking.

Bash

```
kubectl get service
```

You will see `my-nginx-service` with a `TYPE` of `NodePort`.

Step 7: Access Your Application 🚀

minikube service my-nginx-deployment

Step 8: Clean Up (Optional)

When you are finished, you can stop or delete your local cluster.

- **To stop the cluster** (you can start it again later):

Bash

```
minikube stop
```

- **To delete the cluster** (this removes everything):

Bash

```
minikube delete
```