**🌟 Step-by-Step Nginx Deployment on Minikube**

**✅ Step 0: Prerequisites**

Before you begin, make sure you have:

1. **Installed Minikube**
   * Download Minikube
   * Verify installation:
   * minikube version
2. **Installed kubectl** (Kubernetes CLI)
   * Install kubectl
   * Verify installation:
   * kubectl version --client
3. **Docker** (optional)  
   Only needed if you want to build custom images. For public images (like nginx), not required.

**✅ Step 1: Start Minikube**

Start a Kubernetes cluster locally:

minikube start

Verify node is running:

kubectl get nodes

You should see something like:

NAME STATUS ROLES AGE VERSION

minikube Ready control-plane 1m v1.29.0

**✅ Step 2: Create Nginx Deployment**

Use the **official Nginx image** from Docker Hub.

kubectl create deployment nginx-deployment --image=nginx

Check pods:

kubectl get pods

Output example:

NAME READY STATUS RESTARTS AGE

nginx-deployment-7b7f7f7d8b-xyz 1/1 Running 0 30s

**✅ Step 3: Expose Nginx as a Service**

Expose the deployment so it can be accessed outside the cluster:

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

Check service:

kubectl get svc

Output example:

NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE

kubernetes ClusterIP 10.96.0.1 <none> 443/TCP 10m

nginx-deployment NodePort 10.96.154.22 <none> 80:31000/TCP 1m

👉 Here, 31000 is the **NodePort**.

**✅ Step 4: Access Nginx**

Option 1: Use Minikube helper

minikube service nginx-deployment

This opens the **Nginx Welcome Page** in your browser

Option 2: Manual access

minikube ip

Suppose Minikube IP = 192.168.49.2 and NodePort = 31000, open:

http://192.168.49.2:31000

**✅ Step 5: Verify Deployment**

Check pods again:

kubectl get pods -o wide

View logs:

kubectl logs -l app=nginx-deployment

**🔄 Step 6: Cleanup**

When done, clean up resources:

kubectl delete svc nginx-deployment

kubectl delete deployment nginx-deployment

minikube stop

**✅ Recap**

1. Installed **Minikube** & **kubectl**
2. Started Minikube cluster (minikube start)
3. Deployed **nginx** (kubectl create deployment)
4. Exposed service (kubectl expose)
5. Accessed via minikube service or NodePort
6. Cleaned up resources