Minikube & Kubernetes Setup Guide on Windows 11

This guide walks you through setting up Minikube, deploying MySQL and application services, and accessing them locally on Windows 11.

1 Clean up Existing Minikube/Docker Containers

Before starting a fresh cluster:

```
# Remove existing Minikube container
docker rm -f minikube

# List all containers
docker ps -a
```

Optional: Remove other unused containers if needed.

2 Start Minikube

Use the Docker driver and expose ports for services:

```
minikube start --ports=127.0.0.1:30080:30080 --ports=127.0.0.1:31081:31081 --ports=127.0.0.1:31082:31082 --ports=127.0.0.1:31083:31083 --ports=127.0.0.1:31084:31084
```

Verify status:

```
minikube status
```

Expected output:

```
minikube
type: Control Plane
host: Running
kubelet: Running
```

```
apiserver: Running
kubeconfig: Configured
```

3 Verify Kubernetes Nodes

```
kubectl get nodes
```

Expected output:

```
NAME       STATUS   ROLES          AGE   VERSION
minikube   Ready    control-plane  xx    v1.33.1
```

4 Deploy MySQL

4.1 Apply Persistent Volume

```
kubectl apply -f "D:\guru.lk\Backend\k8s\mysql-pv.yaml"
```

4.2 Deploy MySQL

```
kubectl apply -f "D:\guru.lk\Backend\k8s\mysql-deployment.yaml"
```

4.3 Verify MySQL Pod

```
kubectl get pods
```

Expected:

```
NAME                  READY   STATUS    RESTARTS   AGE
mysql-xxxxxxx-xxxxx   1/1     Running   0          xx
```

4.4 Create Databases

```
kubectl exec -it <mysql-pod-name> -- bash
```

Inside MySQL:

```
mysql -u root
CREATE DATABASE guru_authdb;
CREATE DATABASE guru_contentdb;
CREATE DATABASE guru_notificationdb;
CREATE DATABASE guru_communitydb;
SHOW DATABASES;
EXIT;
```

5 Create Kubernetes Secrets

Example: Gmail credentials:

```
kubectl create secret generic gmail-secret `
  --from-literal=username=your-email@gmail.com `
  --from-literal=password=your-app-password
```

6 Deploy Application Services

```
kubectl apply -f "D:\guru.lk\Backend\k8s"
```

Verify pods:

```
kubectl get pods
```

Expected:

```
NAME                        READY   STATUS    RESTARTS   AGE
authservice-xxxxxx          1/1     Running   0          xx
communityservice-xxxx       1/1     Running   0          xx
contentservice-xxxx         1/1     Running   0          xx
mysql-xxxx                  1/1     Running   0          xx
notificationservice-xxxx    1/1     Running   0          xx
```

7 Access Application

Open your browser:

```
http://localhost:30080
```

Your services should now be live.

8️⃣ Optional: Monitor Image Pulls

Kubernetes does not show live download progress. To watch progress:

```
minikube ssh
docker ps  # Check container statuses
docker pull <image-name>:<tag>  # Pre-pull images if needed
kubectl get pods -w  # Watch pods transitioning to Running
```

✅ Notes

• Always delete old Minikube clusters before starting a new one if there are persistent issues:

```
minikube delete
```

• Ensure Docker Desktop is running with sufficient resources (CPU & Memory).