Deploying a Web Application Using Kubernetes

In this assignment, we will **deploy a web application** using **Kubernetes** on a local **Minikube cluster**. This setup will allow us to run and manage containerized applications efficiently.

Steps to Deploy the Web Application

Step 1: Start Minikube

We need to start **Minikube**, which will set up a local Kubernetes cluster.

Run the following command in your terminal:

```
minikube start
```

This will **initialize the Kubernetes cluster** on your local system.

Step 2: Navigate to the Deployment Directory

Now, move to the directory where your **YAML configuration files** are stored.

```
cd ~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL
```

This directory contains the **Kubernetes configuration files** needed for deployment.

Step 3: Apply Namespace

Namespaces in Kubernetes help in organizing different resources. We will **apply the namespace configuration** to create a new namespace for our deployment.

```
kubectl apply -f namespace.yaml
```

This will create a namespace **lampdemo** where our resources will be deployed.

Step 4: Deploy Resources in the Namespace

Now, deploy all the required resources in the **lampdemo** namespace using **kubectl apply**.

```
kubectl apply -n lampdemo -k ./
```

This command applies all the YAML configuration files present in the current directory. It deploys **Apache, PHPMyAdmin, and MySQL** services.

Step 5: Check the Status of Pods

To ensure everything is running correctly, check the status of the pods in the **lampdemo** namespace.

```
kubectl get po -n lampdemo
```

This will display a list of running pods. Each pod should have a **Running** status.

Step 6: Check Services

Next, we check the services running in the **lampdemo** namespace.

```
kubectl get svc -n lampdemo
```

This will show details such as **service name, type, external IP, and ports** needed to access the application.

Step 7: Access the Service

To access the deployed application, use the **Minikube service command**.

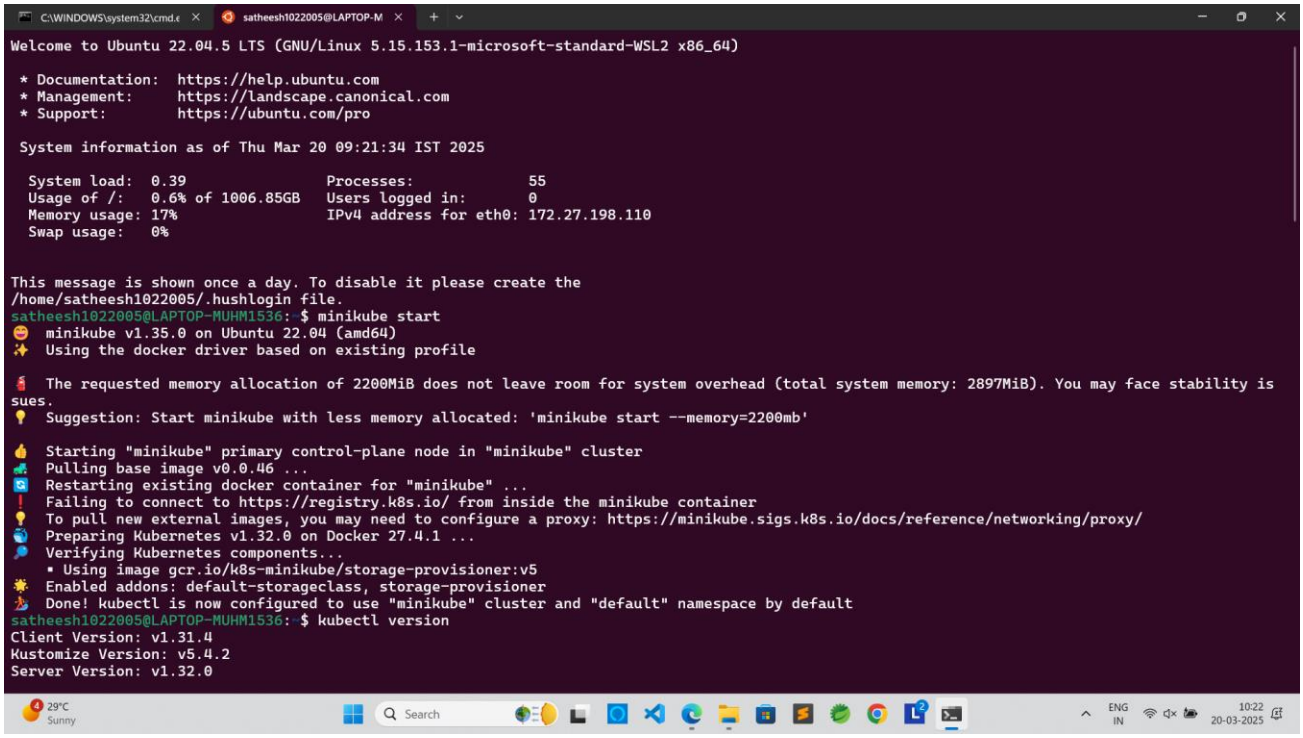
```
minikube service lamp -n lampdemo
```

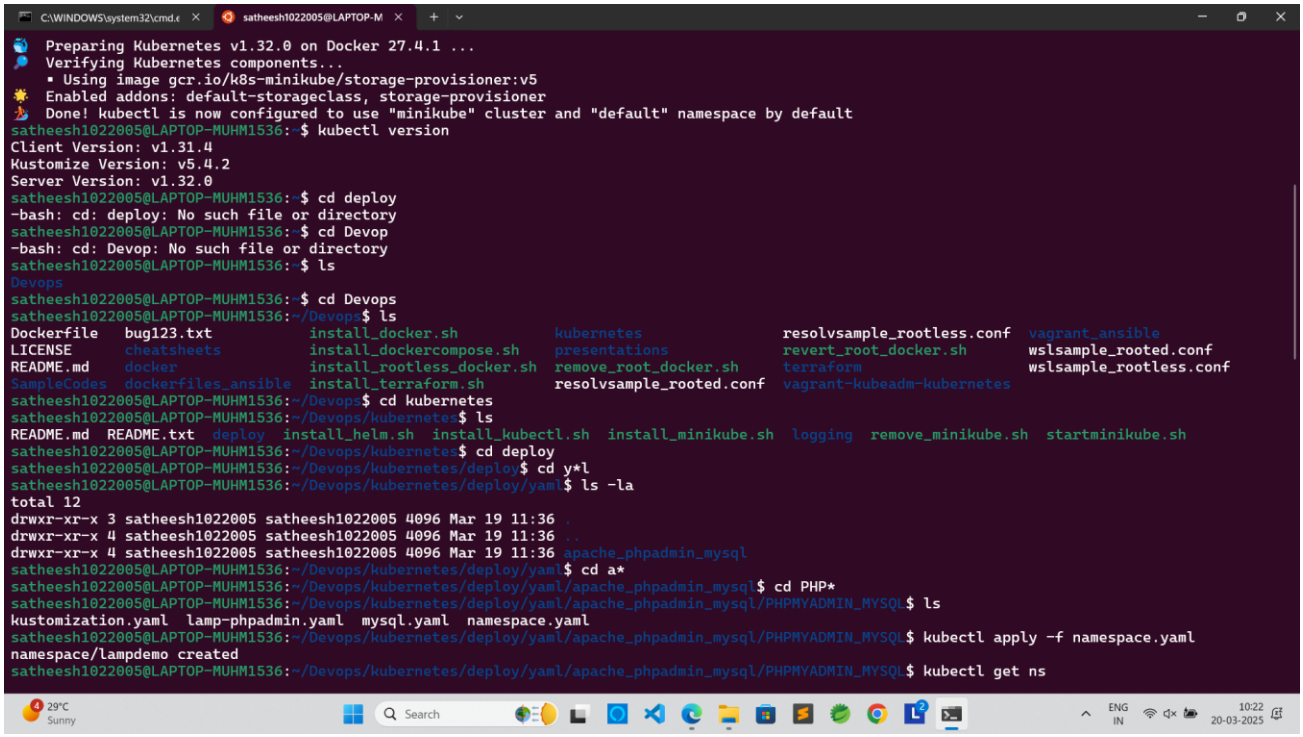
This command will **open the application in your browser** or provide the URL where the service is running.

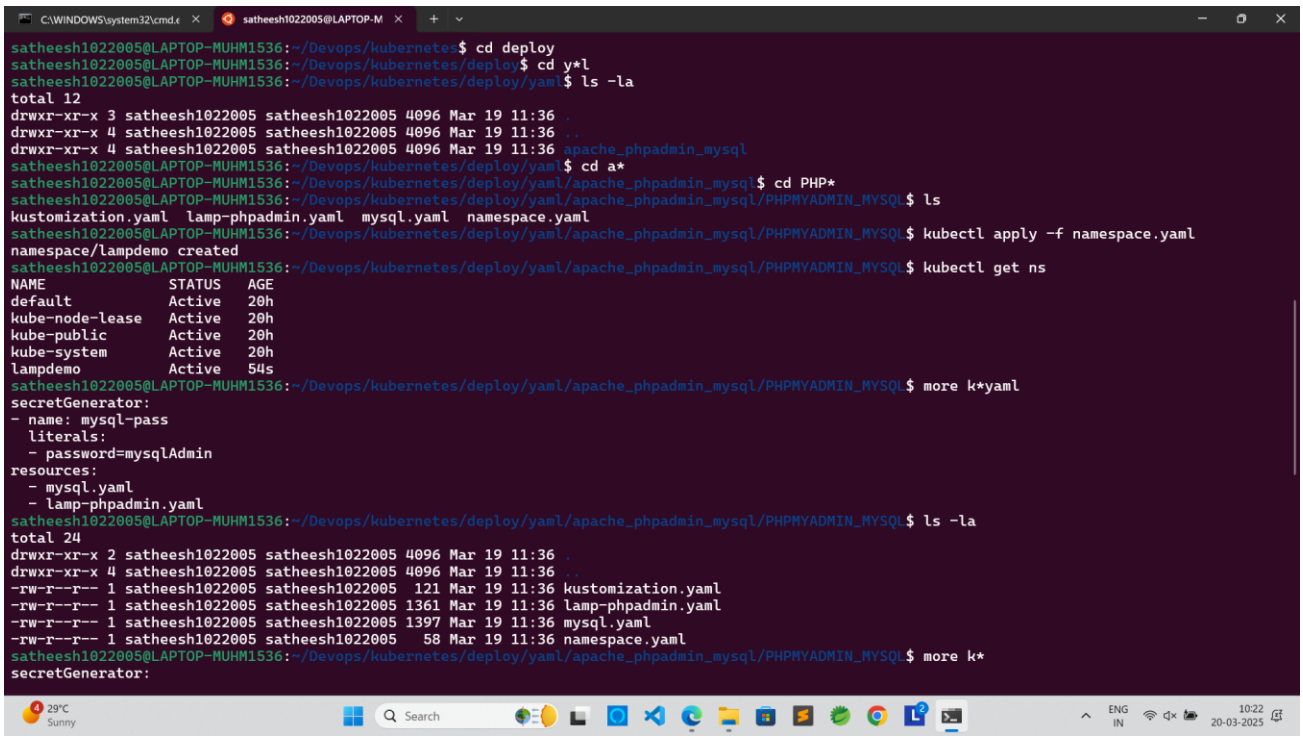
Step 8: Verify the Deployment

Finally, verify if the web application is accessible by visiting the provided URL (e.g., **http://127.0.0.1:35141**).

You should see your **web application** running successfully.




C:\WINDOWS\system32\cmd.e
satheesh1022005@LAPTOP-M
Preparing Kubernetes v1.32.0 on Docker 27.4.1 ...
Verifying Kubernetes components...
▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
Enabled addons: default-storageclass, storage-provisioner
Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
satheesh1022005@LAPTOP-MUHM1536:~$ kubectl version
Client Version: v1.31.4
Kustomize Version: v5.4.2
Server Version: v1.32.0
satheesh1022005@LAPTOP-MUHM1536:~$ cd deploy
-bash: cd: deploy: No such file or directory
satheesh1022005@LAPTOP-MUHM1536:~$ cd Devop
-bash: cd: Devop: No such file or directory
satheesh1022005@LAPTOP-MUHM1536:~$ ls
Devops
satheesh1022005@LAPTOP-MUHM1536:~$ cd Devops
satheesh1022005@LAPTOP-MUHM1536:~/Devops$ ls
Dockerfile bug123.txt install_docker.sh kubernetes resolvsample_rootless.conf vagrant_ansible
LICENSE cheatsheets install_dockercompose.sh presentations revert_root_docker.sh wslsample_rooted.conf
README.md docker install_rootless_docker.sh remove_root_docker.sh terraform wslsample_rootless.conf
SampleCodes dockerfiles_ansible install_terraform.sh resolvsample_rooted.conf vagrant-kubeadm-kubernetes
satheesh1022005@LAPTOP-MUHM1536:~/Devops$ cd kubernetes
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes$ ls
README.md README.txt deploy install_helm.sh install_kubectl.sh install_minikube.sh logging remove_minikube.sh startminikube.sh
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes$ cd deploy
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy$ cd y*l
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml$ ls -la
total 12
drwxr-xr-x 3 satheesh1022005 satheesh1022005 4096 Mar 19 11:36 .
drwxr-xr-x 4 satheesh1022005 satheesh1022005 4096 Mar 19 11:36 ..
drwxr-xr-x 4 satheesh1022005 satheesh1022005 4096 Mar 19 11:36 apache_phpadmin_mysql
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml$ cd a*
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql$ cd PHP*
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ ls
kustomization.yaml lamp-phpadmin.yaml mysql.yaml namespace.yaml
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ kubectl apply -f namespace.yaml
namespace/lampdemo created
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ kubectl get ns
29°C Sunny
Search
ENG IN
10:22 20-03-2025


C:\WINDOWS\system32\cmd.e
satheesh1022005@LAPTOP-M
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes$ cd deploy
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy$ cd y*l
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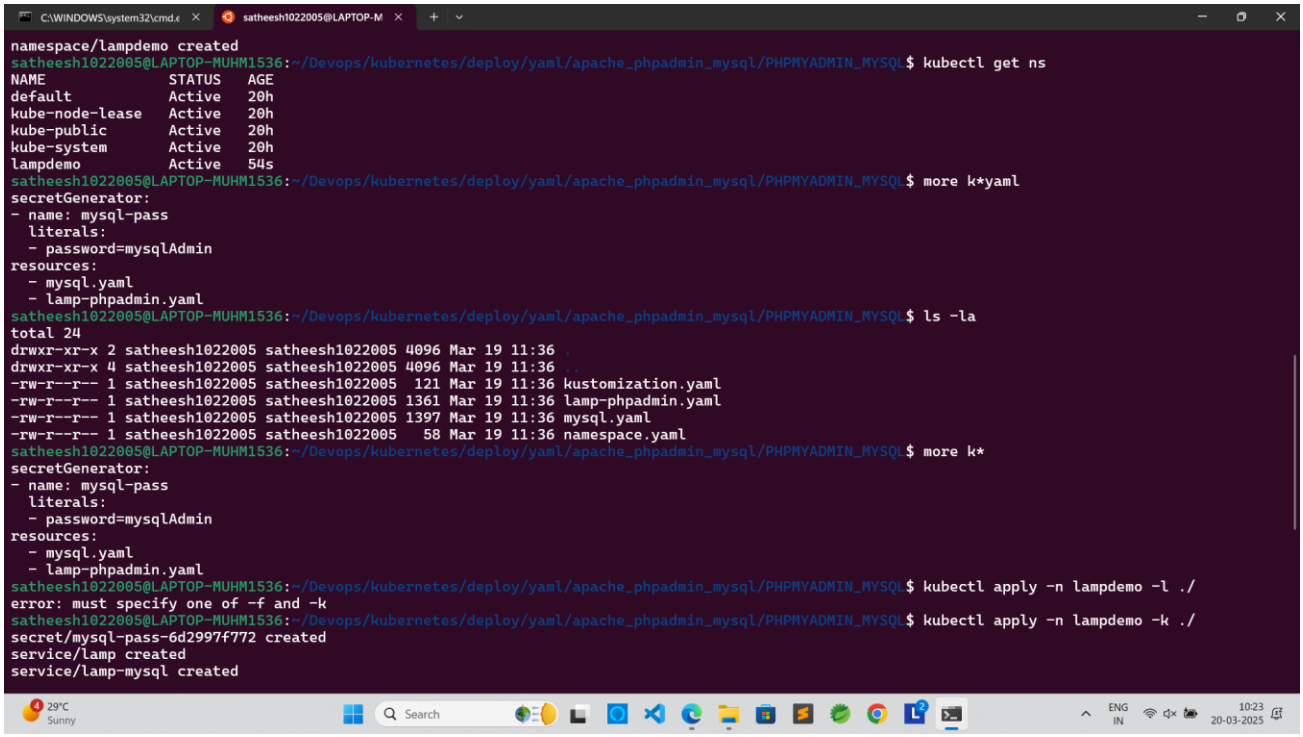
namespace/lampdemo created
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ kubectl get ns
NAME STATUS AGE
default Active 20h
kube-node-lease Active 20h
kube-public Active 20h
kube-system Active 20h
lampdemo Active 54s
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ more k*yaml
secretGenerator:
- name: mysql-pass
literals:
- password=mysqlAdmin
resources:
- mysql.yaml
- lamp-phpadmin.yaml
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ ls -la
total 24
drwxr-xr-x 2 satheesh1022005 satheesh1022005 4096 Mar 19 11:36 .
drwxr-xr-x 4 satheesh1022005 satheesh1022005 4096 Mar 19 11:36 ..
-rw-r--r-- 1 satheesh1022005 satheesh1022005 121 Mar 19 11:36 kustomization.yaml
-rw-r--r-- 1 satheesh1022005 satheesh1022005 1361 Mar 19 11:36 lamp-phpadmin.yaml
-rw-r--r-- 1 satheesh1022005 satheesh1022005 1397 Mar 19 11:36 mysql.yaml
-rw-r--r-- 1 satheesh1022005 satheesh1022005 58 Mar 19 11:36 namespace.yaml
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ more k*
secretGenerator:
29°C Sunny
Search
ENG IN
10:22 20-03-2025


C:\WINDOWS\system32\cmd.e
satheesh1022005@LAPTOP-M
namespace/lampdemo created
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ kubectl get ns
NAME STATUS AGE
default Active 20h
kube-node-lease Active 20h
kube-public Active 20h
kube-system Active 20h
lampdemo Active 54s
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ more k*yaml
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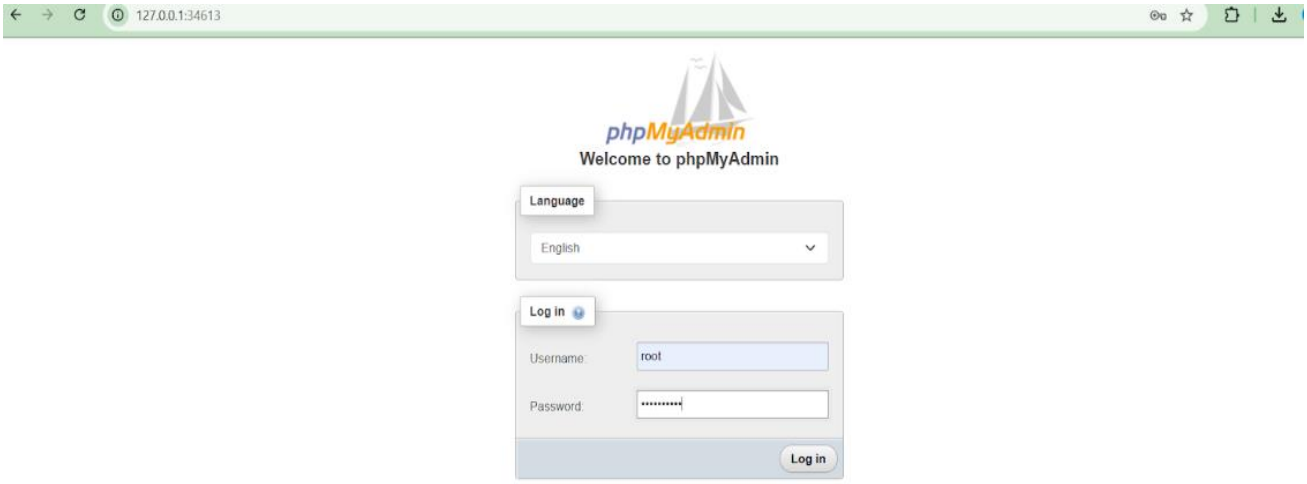
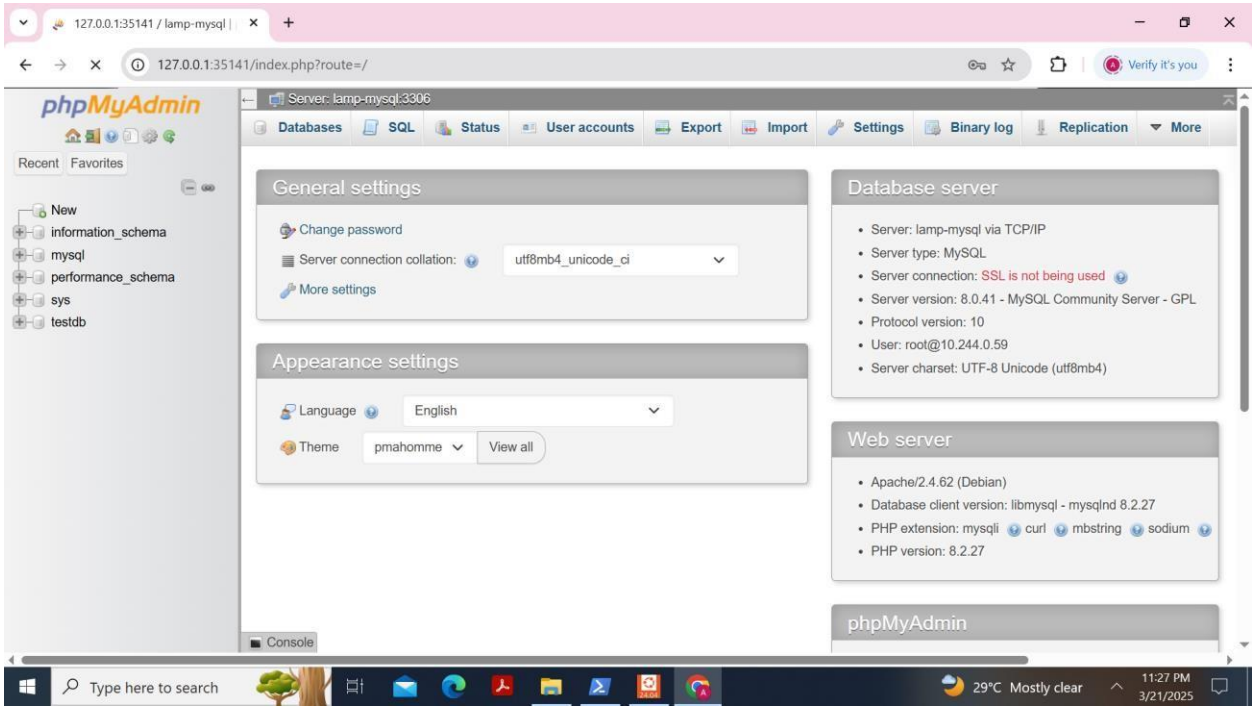
- name: mysql-pass
literals:
- password=mysqlAdmin
resources:
- mysql.yaml
- lamp-phpadmin.yaml
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ ls -la
total 24
drwxr-xr-x 2 satheesh1022005 satheesh1022005 4096 Mar 19 11:36 .
drwxr-xr-x 4 satheesh1022005 satheesh1022005 4096 Mar 19 11:36 ..
-rw-r--r-- 1 satheesh1022005 satheesh1022005 121 Mar 19 11:36 kustomization.yaml
-rw-r--r-- 1 satheesh1022005 satheesh1022005 1361 Mar 19 11:36 lamp-phpadmin.yaml
-rw-r--r-- 1 satheesh1022005 satheesh1022005 1397 Mar 19 11:36 mysql.yaml
-rw-r--r-- 1 satheesh1022005 satheesh1022005 58 Mar 19 11:36 namespace.yaml
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ more k*
secretGenerator:
- name: mysql-pass
literals:
- password=mysqlAdmin
resources:
- mysql.yaml
- lamp-phpadmin.yaml
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ kubectl apply -n lampdemo -l ./
error: must specify one of -f and -k
satheesh1022005@LAPTOP-MUHM1536:~/Devops/kubernetes/deploy/yaml/apache_phpadmin_mysql/PHPMYADMIN_MYSQL$ kubectl apply -n lampdemo -k ./
secret/mysql-pass-6d2997f772 created
service/lamp created
service/lamp-mysql created
29°C
Sunny
Search
ENG
IN
10:23
20-03-2025


127.0.0.1:34613
phpMyAdmin
Welcome to phpMyAdmin
Language
English
Log in
Username:
root
Password:
Log in


127.0.0.1:35141 / lamp-mysql
127.0.0.1:35141/index.php?route=/
Verify it's you
phpMyAdmin
Recent
Favorites
New
information_schema
mysql
performance_schema
sys
testdb
Server: lamp-mysql:3306
Databases
SQL
Status
User accounts
Export
Import
Settings
Binary log
Replication
More
General settings
Change password
Server connection collation:
utf8mb4_unicode_ci
More settings
Appearance settings
Language
English
Theme
pmahomme
View all
Database server
Server: lamp-mysql via TCP/IP
Server type: MySQL
Server connection: SSL is not being used
Server version: 8.0.41 - MySQL Community Server - GPL
Protocol version: 10
User: root@10.244.0.59
Server charset: UTF-8 Unicode (utf8mb4)
Web server
Apache/2.4.62 (Debian)
Database client version: libmysql - mysqlnd 8.2.27
PHP extension: mysqli curl mbstring sodium
PHP version: 8.2.27
phpMyAdmin
Console
Type here to search
29°C Mostly clear
11:27 PM
3/21/2025