Multimode architecture

Today we shall see about multimode cluster in K8s and also get to know the environment variables.

For that, we launch a pod of mysql image.

```
C:\Users\lenovo>kubectl run mydb --image=mysql:5.7
pod/mydb created
```

After the pod gets created, check its status

```
C:\Users\lenovo>kubectl get pods
NAME        READY   STATUS              RESTARTS   AGE
mydb        0/1     ContainerCreating   0          22s
```

We notice that the pod won't get launched and crash. Let us look at the details and reason behind this failure.

```
C:\Users\lenovo>kubectl get pods
NAME        READY   STATUS             RESTARTS   AGE
mydb        0/1     CrashLoopBackOff   1          2m25s
```

Why did this happen? For that, we shall check the logs.

Here we find that some required passwords are not initialized. It means that we need to set up user name and password as environment variables. This is not a problem related to kuberenetes.

```
C:\Users\lenovo>kubectl logs mydb
2021-01-19 16:19:01+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.33-1debian10 started.
2021-01-19 16:19:01+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'
2021-01-19 16:19:01+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.33-1debian10 started.
2021-01-19 16:19:01+00:00 [ERROR] [Entrypoint]: Database is uninitialized and password option is not specified
        You need to specify one of MYSQL_ROOT_PASSWORD, MYSQL_ALLOW_EMPTY_PASSWORD and MYSQL_RANDOM_ROOT_PASSWORD
```

Let us run one of the available pods.

```
C:\Users\lenovo>kubectl get pods
NAME        READY   STATUS             RESTARTS   AGE
mydb        0/1     CrashLoopBackOff   6          12m
rc1-jld2v   1/1     Running            3          4d5h
rc1-jwbvs   1/1     Running            3          4d5h
rc1-m985v   1/1     Running            3          4d5h
rc1-q8t2f   1/1     Running            3          4d5h
skpod1      1/1     Running            3          4d5h
skpod2      1/1     Running            1          4d
skpod3      1/1     Running            1          4d
```

We shall get into the pod using kubectl exec –it skpod1 bash

```
C:\Users\lenovo>kubectl exec -it skpod1 bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exe
c [POD] -- [COMMAND] instead.
[root@skpod1 /]#
```

Linux command is running. It means that we have successfully entered into the container.

```
[root@skpod1 /]# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 172.17.0.5  netmask 255.255.0.0  broadcast 172.17.255.255
        ether 02:42:ac:11:00:05  txqueuelen 0  (Ethernet)
        RX packets 3  bytes 126 (126.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

[root@skpod1 /]#
```

We shall get into the file and set some variable.

```
[root@skpod1 /]# vi /root/.bashrc
```

```
@skpod1:/
# .bashrc

# User specific aliases and functions

alias rm='rm -i'
alias cp='cp -i'
alias mv='mv -i'

# Source global definitions
if [ -f /etc/bashrc ]; then
        . /etc/bashrc
fi

x=18
~
~
```

```
[root@skpod1 /]# vi /root/.bashrc
[root@skpod1 /]# exit
exit

C:\Users\lenovo>kubectl exec -it skpod1 bash
kubectl exec [POD] [COMMAND] is DEPRECATED and
c [POD] -- [COMMAND] instead.
```

```
[root@skpod1 /]# echo $x
18
```

But if this or crashes or gets deleted, we will lose this variable.

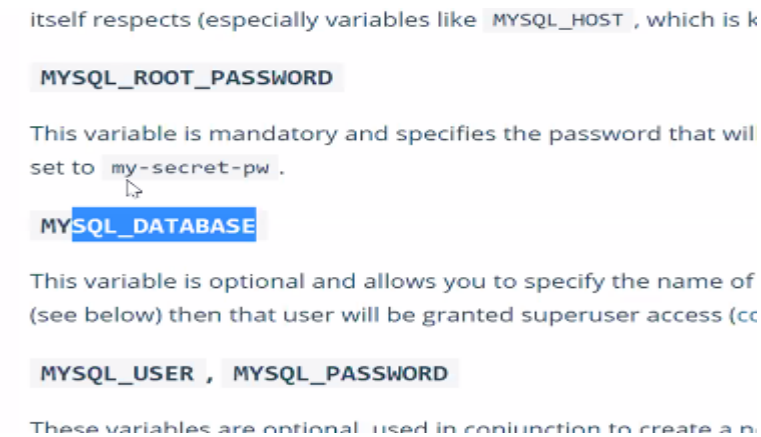
To make the variable permanent, we use the concept of environment variable.

```
C:\Users\lenovo>kubectl run skpod4 --image=vimal13/apache-webserver-php --env=x=10
pod/skpod4 created

C:\Users\lenovo>
```

Now lets start:

We need the following environment variable for mysql image.



To begin, we delete all the existing pods.

```
C:\Users\lenovo>kubectl delete all --all
pod "mydb" deleted
pod "rc1-jld2v" deleted
pod "rc1-jwbvs" deleted
pod "rc1-m985v" deleted
pod "rc1-q8t2f" deleted
pod "skpod1" deleted
pod "skpod2" deleted
pod "skpod3" deleted
pod "skpod4" deleted
replicationcontroller "rc1" deleted
service "kubernetes" deleted
service "lb" deleted
service "rc1" deleted
```

Check if all the pods are successfully deleted.

```
C:\Users\lenovo>kubectl get pods
No resources found in default namespace.
```

For launching the pod using mysql image, we use the following command:

Kubectl run mydb --image=mysql:5.7 --env=MYSQL_ROOT_PASSWOED=shreya --env=MYSQL_DATABASE=wpdb --env=MYSQL_USER=shreya --env=MYSQL_PASSWORD=shreya

```
C:\Users\lenovo>kubectl run mydb --image=mysql:5.7 --env=MYSQL_ROOT_PASSWORD=shreya --env=MY_SQL_DA
TSE=wpdb --env=MYSQL_USER=shreya --env=MYSQL_PASSWORD=shreya
pod/mydb created

C:\Users\lenovo>kubectl get pods
NAME    READY   STATUS    RESTARTS   AGE
mydb    1/1     Running   0          35s
```

Now, launch another pod using wordpress which will act as the frontend.

```
C:\Users\lenovo>kubectl run mywp1 --image=wordpress:5.1.1-php7.3-apache
pod/mywp1 created
```

```
C:\Users\lenovo>kubectl get pods
NAME    READY   STATUS    RESTARTS   AGE
mydb    1/1     Running   0          8m22s
mywp1   1/1     Running   0          6m35s
```

Now, expose the pods and get the IP and port number of wordpress.

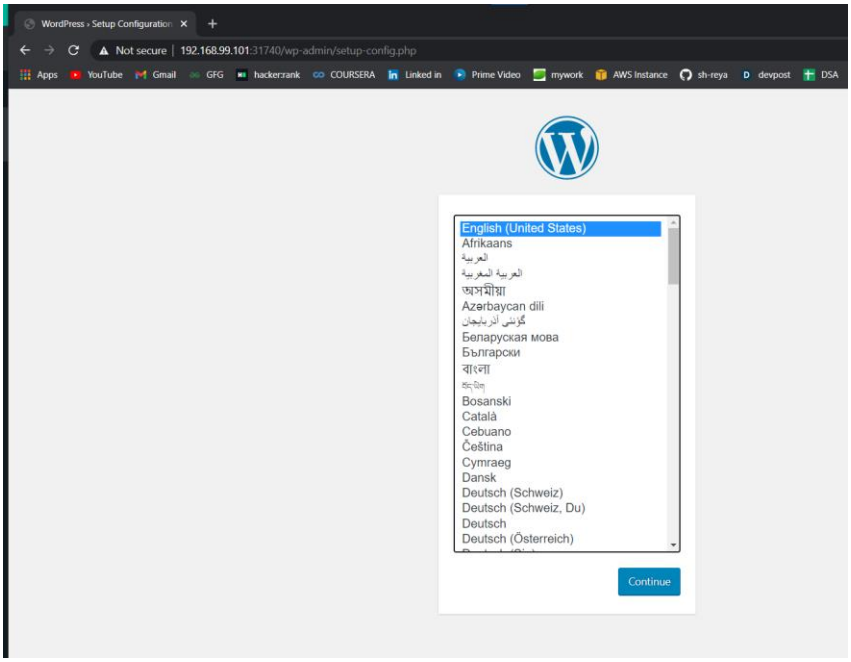
```
C:\Users\lenovo>kubectl get svc
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.96.0.1    <none>        443/TCP   9m56s

C:\Users\lenovo>kubectl expose pod mywp1 --type=NodePort --port=80
service/mywp1 exposed

C:\Users\lenovo>kubectl get svc
NAME         TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
kubernetes   ClusterIP   10.96.0.1       <none>        443/TCP        10m
mywp1        NodePort    10.103.91.103   <none>        80:31740/TCP   15s

C:\Users\lenovo>
```

Use the IP and the port number to get into the homepage of wordpress.



Give the details of the database and you will get successfully connected to the wordpress account.