Name: Shweta Singh
Sap Id: 500098159
RollNo: R2142211484
Branch & Batch: Btech CSE(DevOps) & B4

Lab Exercise 10– Creating Deployment in Kubernetes

Below is a lab exercise that demonstrates how to create and manage a Deployment in Kubernetes.

Step 1: Create a Deployment Configuration File

Create a file named deployment.yaml with the following configuration:

Link of file: (Copy following code from my GitHub repo)

https://github.com/hkshitesh/ACO-LAB-2021-25/blob/main/scripts/deployment.yaml

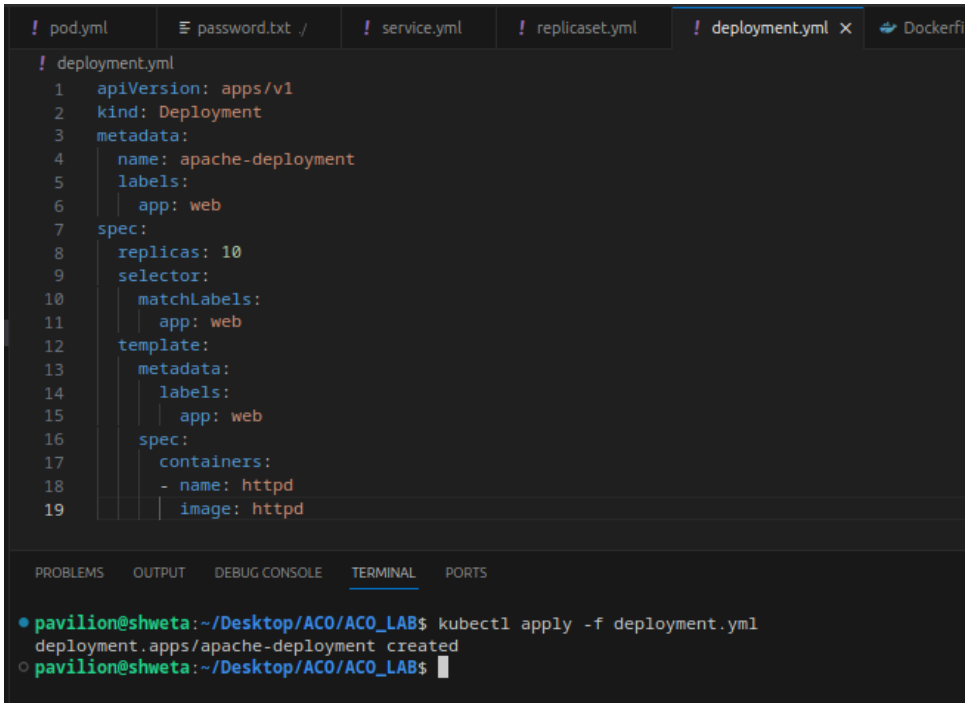
```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: apache-deployment
  labels:
    app: web
spec:
  replicas: 10
  selector:
    matchLabels:
      app: web
  template:
    metadata:
```

```
  labels:
    app: web
spec:
  containers:
  - name: httpd
    image: httpd
```

Step 2: Apply the Deployment Configuration

Apply the configuration to create the Deployment:

```
kubectl apply -f deployment.yaml
```



Step 3: View the Deployment and Pods

View the created Deployment and the associated Pods:

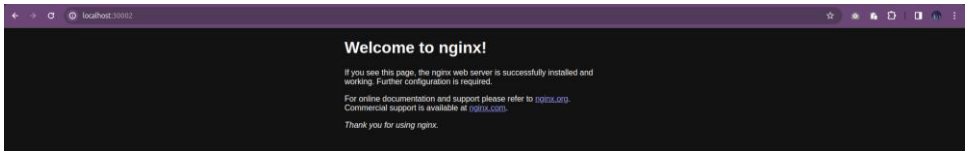
kubectl get deployments

kubectl get pods

```
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl get deployments
NAME            READY   UP-TO-DATE   AVAILABLE   AGE
my-deployment   10/10   10           10          18h
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl get pods
NAME                             READY   STATUS    RESTARTS   AGE
my-deployment-cb87b4875-54m2g    1/1     Running   0          18h
my-deployment-cb87b4875-6qt75    1/1     Running   0          18h
my-deployment-cb87b4875-f26tq    1/1     Running   0          18h
my-deployment-cb87b4875-rx49v    1/1     Running   0          18h
my-deployment-cb87b4875-srvpm    1/1     Running   0          18h
my-deployment-cb87b4875-v4p97    1/1     Running   0          18h
my-deployment-cb87b4875-vgv8m    1/1     Running   0          18h
my-deployment-cb87b4875-w8sdj    1/1     Running   0          18h
my-deployment-cb87b4875-wwmlv    1/1     Running   0          18h
my-deployment-cb87b4875-xxxt9    1/1     Running   0          18h
pavilion@shweta:~/Desktop/ACO/ACO_LAB$
```

Step 4: Accessing the Application running in the pods

```
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ curl localhost:30002
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
body { width: 35em; margin: 0 auto;
font-family: Tahoma, Verdana, Arial, sans-serif; }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>

<p><em>Thank you for using nginx.</em></p>
</body>
</html>
pavilion@shweta:~/Desktop/ACO/ACO_LAB$
```



Step 5: Changing the server from Nginx to Apache

deployment.yml

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: my-deployment
  labels:
    app: web
spec:
  replicas: 10
  selector:
    matchLabels:
      app: web
  template:
    metadata:
      labels:
        app: web
    spec:
      containers:
      - name: my-nginx-cont
        image: httpd
```

Step 6: Apply the changes made in deployment.yml using

kubectl apply –f deployment.yml

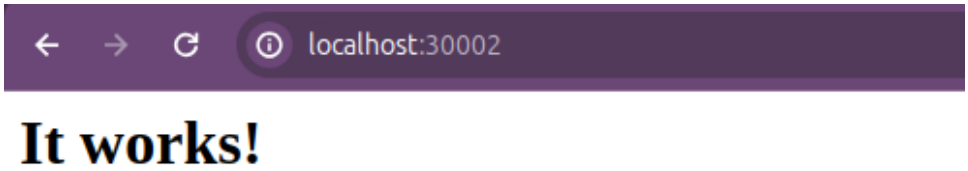
```
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl apply -f deployment.yml
deployment.apps/my-deployment configured
pavilion@shweta:~/Desktop/ACO/ACO_LAB$
```

Step 7: Check the newly pods being created

```
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl get pods
NAME                              READY   STATUS              RESTARTS   AGE
my-deployment-7655695675-5rgnl    1/1     Running             0          35s
my-deployment-7655695675-627cv    0/1     ContainerCreating   0          10s
my-deployment-7655695675-6z88c    1/1     Running             0          35s
my-deployment-7655695675-7jkcz    1/1     Running             0          35s
my-deployment-7655695675-99kvk    0/1     ContainerCreating   0          14s
my-deployment-7655695675-9t8jw    0/1     ErrImagePull        0          23s
my-deployment-7655695675-hcvwm    1/1     Running             0          29s
my-deployment-7655695675-n8kts    1/1     Running             0          35s
my-deployment-7655695675-nwwpg    1/1     Running             0          35s
my-deployment-7655695675-zwfc9    0/1     ContainerCreating   0          19s
my-deployment-cb87b4875-w8sdj     1/1     Running             0          18h
my-deployment-cb87b4875-wwmlv     1/1     Running             0          18h
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl get pods
NAME                              READY   STATUS              RESTARTS   AGE
my-deployment-7655695675-5rgnl    1/1     Running             0          41s
my-deployment-7655695675-627cv    0/1     ContainerCreating   0          16s
my-deployment-7655695675-6z88c    1/1     Running             0          41s
my-deployment-7655695675-7jkcz    1/1     Running             0          41s
my-deployment-7655695675-99kvk    1/1     Running             0          20s
my-deployment-7655695675-9t8jw    0/1     ErrImagePull        0          29s
my-deployment-7655695675-hcvwm    1/1     Running             0          35s
my-deployment-7655695675-n8kts    1/1     Running             0          41s
my-deployment-7655695675-nwwpg    1/1     Running             0          41s
my-deployment-7655695675-zwfc9    1/1     Running             0          25s
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl get pods
NAME                              READY   STATUS    RESTARTS   AGE
my-deployment-7655695675-5rgnl    1/1     Running   0          52s
my-deployment-7655695675-627cv    1/1     Running   0          27s
my-deployment-7655695675-6z88c    1/1     Running   0          52s
my-deployment-7655695675-7jkcz    1/1     Running   0          52s
my-deployment-7655695675-99kvk    1/1     Running   0          31s
my-deployment-7655695675-9t8jw    1/1     Running   0          40s
my-deployment-7655695675-hcvwm    1/1     Running   0          46s
my-deployment-7655695675-n8kts    1/1     Running   0          52s
my-deployment-7655695675-nwwpg    1/1     Running   0          52s
my-deployment-7655695675-zwfc9    1/1     Running   0          36s
pavilion@shweta:~/Desktop/ACO/ACO_LAB$
```

Step 8: Access the Apache server application running in the same port 30002 after all its pods are created

```
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ curl localhost:30002
<html><body><h1>It works!</h1></body></html>
pavilion@shweta:~/Desktop/ACO/ACO_LAB$
```



Step 9: Roll back to the previous version(i.e., running the pods of nginx again)

```
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl rollout undo deployment my-deployment
deployment.apps/my-deployment rolled back
```

```
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl get all
NAME                                 READY   STATUS              RESTARTS   AGE
pod/my-deployment-7655695675-5rgnl   1/1     Running             0          5m1s
pod/my-deployment-7655695675-7jkcz   1/1     Running             0          5m1s
pod/my-deployment-7655695675-99kvk   1/1     Running             0          4m40s
pod/my-deployment-7655695675-9t8jw   1/1     Running             0          4m49s
pod/my-deployment-7655695675-hcvwm   0/1     Terminating         0          4m55s
pod/my-deployment-7655695675-n8kts   1/1     Running             0          5m1s
pod/my-deployment-7655695675-nwwpg   1/1     Running             0          5m1s
pod/my-deployment-7655695675-zwfc9   1/1     Running             0          4m45s
pod/my-deployment-cb87b4875-9zr6k    0/1     ContainerCreating   0          1s
pod/my-deployment-cb87b4875-p68hl    0/1     ContainerCreating   0          7s
pod/my-deployment-cb87b4875-p756q    0/1     ContainerCreating   0          7s
pod/my-deployment-cb87b4875-p86xq    0/1     ContainerCreating   0          7s
pod/my-deployment-cb87b4875-stsct    0/1     ContainerCreating   0          7s
pod/my-deployment-cb87b4875-v9254    1/1     Running             0          7s

NAME                     TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)        AGE
service/kubernetes       ClusterIP   10.96.0.1      <none>        443/TCP        42d
service/my-service       NodePort    10.110.225.1   <none>        80:30001/TCP   19h
service/my-service-web   NodePort    10.106.218.0   <none>        80:30002/TCP   18h

NAME                            READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/my-deployment   8/10    6            8           18h

NAME                                       DESIRED   CURRENT   READY   AGE
replicaset.apps/my-deployment-7655695675   7         7         7       5m1s
replicaset.apps/my-deployment-cb87b4875    6         6         1       18h
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl get all
NAME                                 READY   STATUS              RESTARTS   AGE
pod/my-deployment-7655695675-5rgnl   1/1     Running             0          5m13s
pod/my-deployment-7655695675-7jkcz   1/1     Running             0          5m13s
pod/my-deployment-7655695675-9t8jw   1/1     Terminating         0          5m1s
pod/my-deployment-7655695675-n8kts   1/1     Running             0          5m13s
pod/my-deployment-7655695675-nwwpg   1/1     Running             0          5m13s
pod/my-deployment-cb87b4875-6rvpx    0/1     ContainerCreating   0          5s
pod/my-deployment-cb87b4875-8vfwq    0/1     ContainerCreating   0          9s
pod/my-deployment-cb87b4875-9zr6k    0/1     ContainerCreating   0          13s
pod/my-deployment-cb87b4875-jhgj1    0/1     ContainerCreating   0          0s
pod/my-deployment-cb87b4875-p68hl    1/1     Running             0          19s
pod/my-deployment-cb87b4875-p756q    0/1     ContainerCreating   0          19s
pod/my-deployment-cb87b4875-p86xq    1/1     Running             0          19s
pod/my-deployment-cb87b4875-stsct    1/1     Running             0          19s
pod/my-deployment-cb87b4875-v9254    1/1     Running             0          19s

NAME                     TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)        AGE
service/kubernetes       ClusterIP   10.96.0.1      <none>        443/TCP        42d
service/my-service       NodePort    10.110.225.1   <none>        80:30001/TCP   19h
service/my-service-web   NodePort    10.106.218.0   <none>        80:30002/TCP   18h

NAME                            READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/my-deployment   8/10    9            8           18h

NAME                                       DESIRED   CURRENT   READY   AGE
replicaset.apps/my-deployment-7655695675   4         4         4       5m13s
replicaset.apps/my-deployment-cb87b4875    9         9         4       18h
```

```
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ kubectl get all
NAME                                READY   STATUS    RESTARTS   AGE
pod/my-deployment-cb87b4875-6rvpx   1/1     Running   0          41s
pod/my-deployment-cb87b4875-8vfwq   1/1     Running   0          45s
pod/my-deployment-cb87b4875-9zr6k   1/1     Running   0          49s
pod/my-deployment-cb87b4875-jhgj1   1/1     Running   0          36s
pod/my-deployment-cb87b4875-p68h1   1/1     Running   0          55s
pod/my-deployment-cb87b4875-p756q   1/1     Running   0          55s
pod/my-deployment-cb87b4875-p86xq   1/1     Running   0          55s
pod/my-deployment-cb87b4875-stsct   1/1     Running   0          55s
pod/my-deployment-cb87b4875-v4fwb   1/1     Running   0          32s
pod/my-deployment-cb87b4875-v9254   1/1     Running   0          55s

NAME                     TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)        AGE
service/kubernetes       ClusterIP   10.96.0.1      <none>        443/TCP        42d
service/my-service       NodePort    10.110.225.1   <none>        80:30001/TCP   19h
service/my-service-web   NodePort    10.106.218.0   <none>        80:30002/TCP   18h

NAME                            READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/my-deployment   10/10   10           10          18h

NAME                                       DESIRED   CURRENT   READY   AGE
replicaset.apps/my-deployment-7655695675   0         0         0       5m49s
replicaset.apps/my-deployment-cb87b4875    10        10        10      18h
pavilion@shweta:~/Desktop/ACO/ACO_LAB$
```

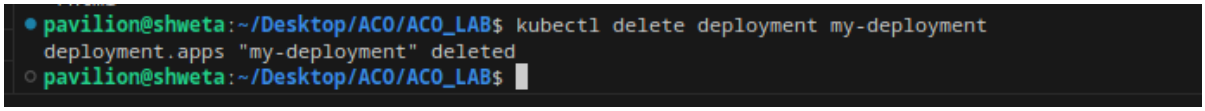
Step 10: Access the server again running on the same port 30002

```
pavilion@shweta:~/Desktop/ACO/ACO_LAB$ curl localhost:30002
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
body { width: 35em; margin: 0 auto;
font-family: Tahoma, Verdana, Arial, sans-serif; }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>

<p><em>Thank you for using nginx.</em></p>
</body>
</html>
pavilion@shweta:~/Desktop/ACO/ACO_LAB$
```

Step 11: Delete the Deployment

Delete the Deployment:

```
kubectl delete deployment my-deployment
```



Conclusion

This exercise demonstrated how to create, manage, and update a Deployment in Kubernetes. You learned how to scale the Deployment, update the image, and perform a rolling update to the Deployment. Experiment further with different configurations and update strategies to deepen your understanding of managing Deployments in Kubernetes.