Module-9: Container Orchestration using Kubernetes Part - II

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DEMO-3: StatefulSets

1. Create 2 persistent volumes for your pods to bind to

   Syntax: vi pv.yaml

```
kind: PersistentVolume
apiVersion: v1
metadata:
  name: nginx-pv
  labels:
    type: local
    app: nginx
spec:
  storageClassName: manual
  capacity:
    storage: 1Gi
  accessModes:
  - ReadWriteOnce
  hostPath:
    path: "/home/edureka/data"
```

   Create another persistent with same settings except with a different metadata name and hostpath

   Create the volumes using create command:
   Syntax: kubectl create -f pv.yml

```
edureka@kmaster:~/demo$ kubectl create -f pv.yml
persistentvolume/nginx-pv created
edureka@kmaster:~/demo$ kubectl create -f pv1.yml
persistentvolume/nginx-pv1 created
```

2. Create a yaml file that contains both the nginx StatefulSet and the service required to access it

   Syntax: vi state.yml

```
apiVersion: v1
kind: Service
metadata:
  name: nginx
  labels:
    app: nginx
spec:
  ports:
  - port: 80
    name: web
  clusterIP: None
  selector:
    app: nginx
---
apiVersion: apps/v1
kind: StatefulSet
metadata:
  name: web
spec:
  serviceName: "nginx"
  replicas: 2
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
      - name: nginx
        image: k8s.gcr.io/nginx-slim:0.8
        ports:
        - containerPort: 80
          name: web
        volumeMounts:
        - name: www
          mountPath: /usr/share/nginx/html
  volumeClaimTemplates:
  - metadata:
      name: www
    spec:
      accessModes: [ "ReadWriteOnce" ]
      resources:
        requests:
          storage: 1Gi
```

Now, execute the yaml file to create the service and the statefulset

Syntax: kubectl create -f state.yml

```
edureka@kmaster:~/demo$ kubectl create -f state.yml
service/nginx created
statefulset.apps/web created
```

3. We can check if the statefulset, service and the pods associated are creates successfully

Syntax: kubectl get statefulset
kubectl get svc
kubectl get pods

```
edureka@kmaster:~/demo$ kubectl get statefulsets
NAME   READY   AGE
web    2/2     9m46s
edureka@kmaster:~/demo$ kubectl get svc
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.96.0.1    <none>        443/TCP   17d
nginx        ClusterIP   None         <none>        80/TCP    9m53s
edureka@kmaster:~/demo$ kubectl get pods
NAME    READY   STATUS    RESTARTS   AGE
web-0   1/1     Running   0          9m58s
web-1   1/1     Running   0          9m53s
```


You can notice that pods are created sequentially and are given unique ID's which are retained even after multiple restarts

4. Now to test if the statefulset is working as expected we will check the details of one of the pods, delete and wait for it to get rescheduled

Syntax: kubectl describe pods web-1

```
edureka@kmaster:~/demo$ kubectl describe pods web-1
Name:         web-1
Namespace:    default
Priority:     0
Node:         kslave1/172.31.24.142
Start Time:   Fri, 09 Jul 2021 14:39:41 +0000
Labels:       app=nginx
              controller-revision-hash=web-5f6745bd6f
              statefulset.kubernetes.io/pod-name=web-1
Annotations:  <none>
Status:       Running
```

Now, delete the pod and wait for it to redeploy

Syntax: kubectl delete pods web-1

```
edureka@kmaster:~/demo$ kubectl get pods
NAME    READY   STATUS    RESTARTS   AGE
web-0   1/1     Running   0          17m
web-1   1/1     Running   0          17m
edureka@kmaster:~/demo$ kubectl delete pods web-1
pod "web-1" deleted
^C
edureka@kmaster:~/demo$ kubectl get pods
NAME    READY   STATUS              RESTARTS   AGE
web-0   1/1     Running             0          18m
web-1   0/1     ContainerCreating   0          0s
edureka@kmaster:~/demo$ kubectl get pods
NAME    READY   STATUS    RESTARTS   AGE
web-0   1/1     Running   0          18m
web-1   1/1     Running _ 0          13s
```

We can check the details to see that the pod as retained its identity

```
edureka@kmaster:~/demo$ kubectl describe pods web-1
Name:         web-1
Namespace:    default
Priority:     0
Node:         kslave1/172.31.24.142
Start Time:   Fri, 09 Jul 2021 14:57:58 +0000
Labels:       app=nginx
              controller-revision-hash=web-5f6745bd6f
              statefulset.kubernetes.io/pod-name=web-1
Annotations:  <none>
Status:       Running
```