

Lab14 – Creating a Persistent Volume

In this exercise, you will create a PersistentVolume, connect it to a PersistentVolumeClaim and mount the claim to a specific path of a Pod.

1. Create a PersistentVolume named `pv`, access mode `ReadWriteMany`, 512Mi of storage capacity and the host path `/data/config`.

```
brahim@Training:~/lab14-persistent-volume$ vim pv.yaml
brahim@Training:~/lab14-persistent-volume$ cat pv.yaml
kind: PersistentVolume
apiVersion: v1
metadata:
  name: pv
spec:
  capacity:
    storage: 512Mi
  accessModes:
    - ReadWriteMany
  hostPath:
    path: /data/config

brahim@Training:~/lab14-persistent-volume$
brahim@Training:~/lab14-persistent-volume$ kubectl apply -f pv.yaml
persistentvolume/pv created
brahim@Training:~/lab14-persistent-volume$ kubectl get pv
NAME      CAPACITY  ACCESS MODES  RECLAIM POLICY  STATUS    CLAIM      STORAGECLASS  VOLUMEATTRIBUTESCLASS  REASON  AGE
pv         512Mi     RWX           Retain          Available
brahim@Training:~/lab14-persistent-volume$
brahim@Training:~/lab14-persistent-volume$
```

2. Create a PersistentVolumeClaim named `pvc`. The claim should request 256Mi and use an empty string value for the storage class. Ensure that the PersistentVolumeClaim is properly bound after its creation.

```
brahim@Training:~/lab14-persistent-volume$ vim pvc.yaml
brahim@Training:~/lab14-persistent-volume$ cat pvc.yaml
kind: PersistentVolumeClaim
apiVersion: v1
metadata:
  name: pvc
spec:
  accessModes:
    - ReadWriteMany
  storageClassName: ""
  resources:
    requests:
      storage: 256Mi

brahim@Training:~/lab14-persistent-volume$
brahim@Training:~/lab14-persistent-volume$ kubectl apply -f pvc.yaml
persistentvolumeclaim/pvc created
brahim@Training:~/lab14-persistent-volume$
brahim@Training:~/lab14-persistent-volume$ kubectl get pv,pvc
NAME      CAPACITY  ACCESS MODES  RECLAIM POLICY  STATUS    CLAIM      STORAGECLASS  VOLUMEATTRIBUTESCLASS  REASON  AGE
persistentvolume/pv  512Mi     RWX           Retain          Bound     default/pvc
brahim@Training:~/lab14-persistent-volume$
NAME      STATUS  VOLUME  CAPACITY  ACCESS MODES  STORAGECLASS  VOLUMEATTRIBUTESCLASS  AGE
persistentvolumeclaim/pvc  Bound   pv      512Mi     RWX           <unset>      <unset>                10s
brahim@Training:~/lab14-persistent-volume$
```

3. Mount the PersistentVolumeClaim from a new Pod named `app` with the path `/var/app/config`. The Pod uses the image `nginx:1.21.6`.

```
brahim@Training:~/lab14-persistent-volume$ vim pod.yaml
brahim@Training:~/lab14-persistent-volume$ cat pod.yaml
apiVersion: v1
kind: Pod
metadata:
  name: app
spec:
  containers:
  - image: nginx:1.21.6
    name: app
    volumeMounts:
    - mountPath: "/data/app/config"
      name: configpvc
  volumes:
  - name: configpvc
    persistentVolumeClaim:
      claimName: pvc
  restartPolicy: Never
brahim@Training:~/lab14-persistent-volume$
brahim@Training:~/lab14-persistent-volume$ kubectl apply -f pod.yaml
pod/app created
brahim@Training:~/lab14-persistent-volume$
brahim@Training:~/lab14-persistent-volume$
```

4. Open an interactive shell to the Pod and create a file in the directory `/var/app/config`.

```
brahim@Training:~/lab14-persistent-volume$ kubectl exec -it app -- sh
# cd /data/app/config
# ls
# touch test.conf
# ls
test.conf
# exit
brahim@Training:~/lab14-persistent-volume$
brahim@Training:~/lab14-persistent-volume$ kubectl get pod app -owide
NAME    READY   STATUS    RESTARTS   AGE   IP        NODE    NOMINATED NODE   READINESS GATES
app     1/1     Running   0          6m52s  10.40.0.2 kube-node1  <none>          <none>
brahim@Training:~/lab14-persistent-volume$
brahim@Training:~/lab14-persistent-volume$ ssh vagrant@192.168.56.11
The authenticity of host '192.168.56.11 (192.168.56.11)' can't be established.
ED25519 key fingerprint is SHA256:AL5Iq8JOaaF9lb9ZTu1/54GvCVniXVxjVXlTK19L7g.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.56.11' (ED25519) to the list of known hosts.
vagrant@192.168.56.11's password:
Last login: Fri Mar  8 19:56:33 2024 from 10.0.2.2
vagrant@kube-node1:~$
vagrant@kube-node1:~$ ls /data/config/
test.conf
vagrant@kube-node1:~$ exit
logout
Connection to 192.168.56.11 closed.
brahim@Training:~/lab14-persistent-volume$
```