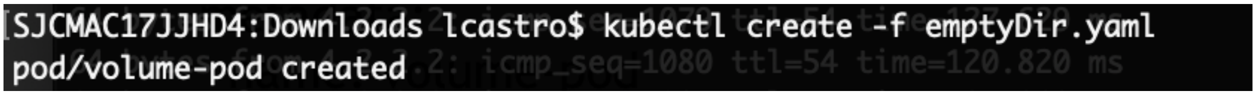
Step 1 - Creating a container with an emptyDir volume

Create a YAML File

vi emptyDir.yaml

```
apiVersion: v1
kind: Pod
metadata:
  name: volume-pod
spec:
  containers:
  - image: busybox
    name: busybox
    volumeMounts:
    - mountPath: /tmp/storage
      name: my-volume
  volumes:
  - name: my-volume
    emptyDir: {}
```

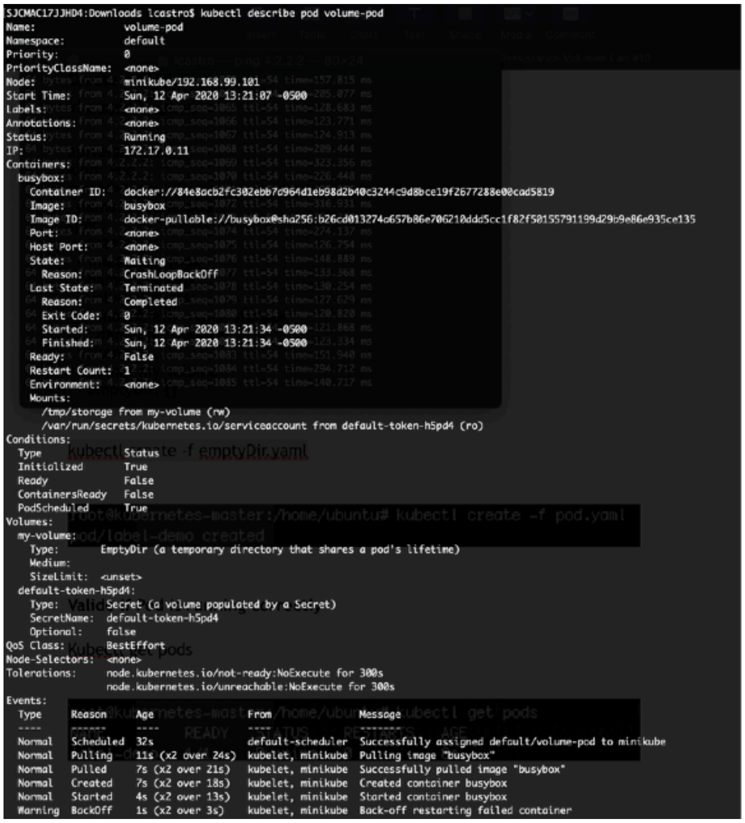
kubectl create -f emptyDir.yaml



```
[SJCMAC17JJHD4:Downloads lcastro$ kubectl create -f emptyDir.yaml
pod/volume-pod created
```

Valide Pods emptyDir

Kubectl describe pod volume-pod



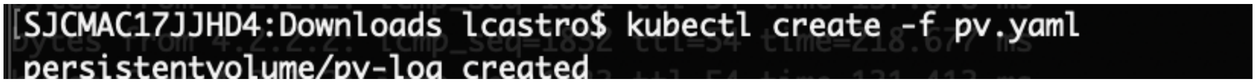
```
[SJCMAC17JJHD4:Downloads lcastro$ kubectl describe pod volume-pod
Name:               volume-pod
Namespace:          default
Priority:           0
PriorityClassName:  <none>
Node:               minikube/192.168.99.101
Start Time:         Sun, 12 Apr 2020 13:21:07 -0500
Labels:             <none>
Annotations:        <none>
Status:             Running
IP:                 172.17.0.11
Containers:
  busybox:
    Container ID:   docker://84e8acb2fc302ebb7d964d1eb98d2b40c3244c9d8bce19f2677288e00cad5819
    Image:          busybox
    Image ID:       docker-pullable://busybox@sha256:b26cd013274a657b86e706210ddd5cc1f82f50155791199d29b9e86e935ce135
    Port:           <none>
    Host Port:      <none>
    State:          Waiting
      Reason:       CrashLoopBackOff
    Last State:     Terminated
      Reason:       Completed
      Exit Code:    0
      Started:      Sun, 12 Apr 2020 13:21:34 -0500
      Finished:     Sun, 12 Apr 2020 13:21:34 -0500
    Ready:          False
    Restart Count:  1
    Environment:    <none>
    Mounts:
      /tmp/storage from my-volume (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-h5pd4 (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             False
  ContainersReady   False
  PodScheduled      True
Volumes:
  my-volume:
    Type:       EmptyDir (a temporary directory that shares a pod's lifetime)
    Medium:
    SizeLimit:  <unset>
  default-token-h5pd4:
    Type:        Secret (a volume populated by a Secret)
    SecretName:  default-token-h5pd4
    Optional:    false
QoS Class:       BestEffort
Node-Selectors:  <none>
Tolerations:     node.kubernetes.io/not-ready:NoExecute for 300s
                 node.kubernetes.io/unreachable:NoExecute for 300s
Events:
  Type     Reason     Age                From               Message
  ----     ------     ----               ----               -------
  Normal   Scheduled  32s                default-scheduler  Successfully assigned default/volume-pod to minikube
  Normal   Pulling    11s (x2 over 24s)  kubelet, minikube  Pulling image "busybox"
  Normal   Pulled     7s (x2 over 21s)   kubelet, minikube  Successfully pulled image "busybox"
  Normal   Created    7s (x2 over 18s)   kubelet, minikube  Created container busybox
  Normal   Started    4s (x2 over 13s)   kubelet, minikube  Started container busybox
  Warning  BackOff    1s (x2 over 3s)    kubelet, minikube  Back-off restarting failed container
```

Step 2 - Creating a Persistence Volume

vi pv.yaml

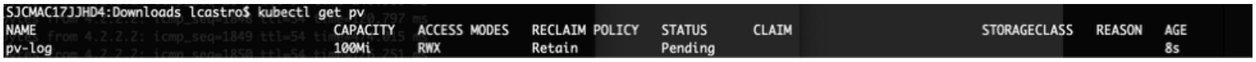
```
apiVersion: v1
kind: PersistentVolume
metadata:
  name: pv-log
spec:
  accessModes:
    - ReadWriteMany
  capacity:
    storage: 100Mi
  hostPath:
    path: /pv/log
```

kubectl create -f pv.yaml



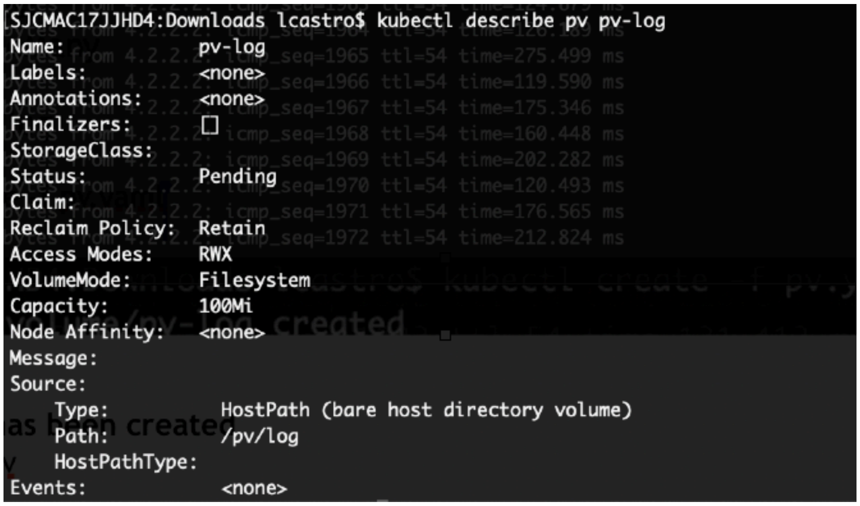
```
SJCMAC17JJHD4:Downloads lcastro$ kubectl create -f pv.yaml
persistentvolume/pv-log created
```

Validate PV has been created
Kubectl get pv



```
SJCMAC17JJHD4:Downloads lcastro$ kubectl get pv
NAME                                                  CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS    CLAIM                                    STORAGECLASS   REASON   AGE
pv-log                                                100Mi      RWX            Retain           Pending                                                                    8s
```

Kubectl describe pv pv-log



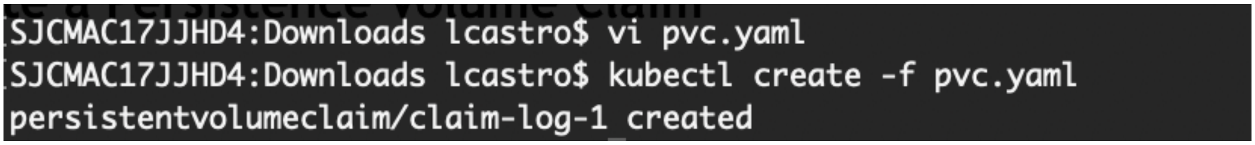
```
SJCMAC17JJHD4:Downloads lcastro$ kubectl describe pv pv-log
Name:            pv-log
Labels:          <none>
Annotations:     <none>
Finalizers:      □
StorageClass:
Status:          Pending
Claim:
Reclaim Policy:  Retain
Access Modes:    RWX
VolumeMode:      Filesystem
Capacity:        100Mi
Node Affinity:   <none>
Message:
Source:
    Type:          HostPath (bare host directory volume)
    Path:          /pv/log
    HostPathType:
Events:            <none>
```

Step 3 - Create a Persistence Volume Claim

vi pvc.yaml

```
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
 name: claim-log-1
spec:
 accessModes:
 - ReadWriteMany
 resources:
   requests:
      storage: 50Mi
```

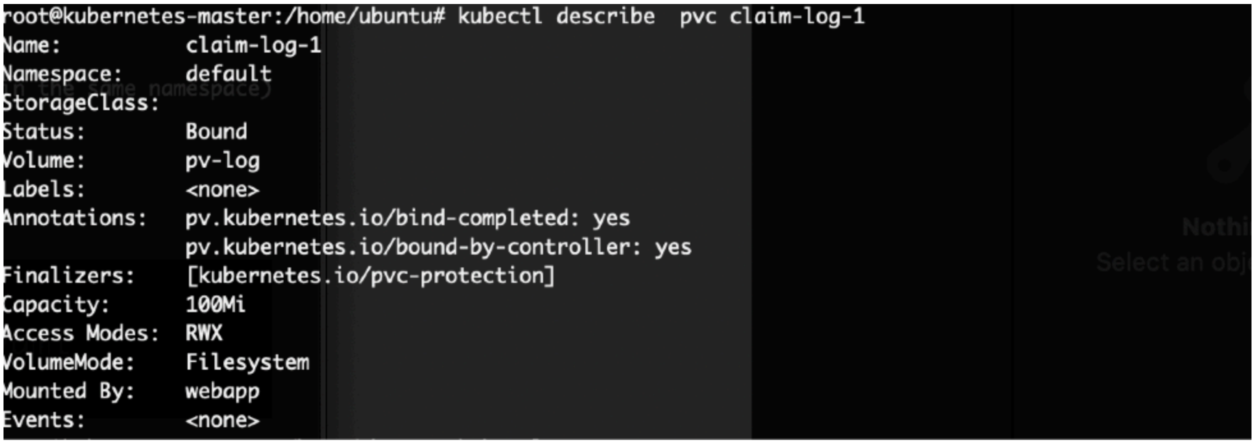
kubectl create -f pvc.yaml



```
SJCMAC17JJHD4:Downloads lcastro$ vi pvc.yaml
SJCMAC17JJHD4:Downloads lcastro$ kubectl create -f pvc.yaml
persistentvolumeclaim/claim-log-1 created
```

Validate PVC has been created

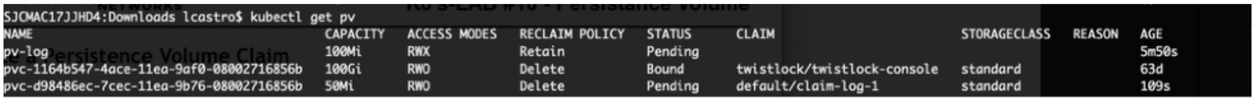
kubectl describe pvc claim-log-1



```
root@kubernetes-master:/home/ubuntu# kubectl describe  pvc claim-log-1
Name:          claim-log-1
Namespace:     default
StorageClass:
Status:        Bound
Volume:        pv-log
Labels:        <none>
Annotations:   pv.kubernetes.io/bind-completed: yes
               pv.kubernetes.io/bound-by-controller: yes
Finalizers:    [kubernetes.io/pvc-protection]
Capacity:      100Mi
Access Modes:  RWX
VolumeMode:    Filesystem
Mounted By:    webapp
Events:        <none>
```

Validate PV has a Claim from PVC created

kubectl get pv



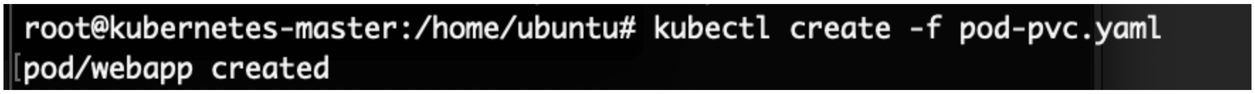
```
SJCMAC17JJHD4:Downloads lcastro$ kubectl get pv
NAME                                       CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS    CLAIM                           STORAGECLASS   REASON   AGE
pv-log                                     100Mi      RWX            Retain           Pending                                                           5m50s
pvc-1164b547-4ace-11ea-9af0-08002716856b   100Gi      RWO            Delete           Bound     twistlock/twistlock-console     standard                63d
pvc-d98486ec-7cec-11ea-9b76-08002716856b   50Mi       RWO            Delete           Pending   default/claim-log-1             standard                109s
```

Step 4 - Use a PersistentVolumeClaim in a Pod

vi pod-pvc.yaml

```
apiVersion: v1
kind: Pod
metadata:
  name: webapp
spec:
  containers:
  - name: event-simulator
    image: kodekloud/event-simulator
    env:
    - name: LOG_HANDLERS
      value: file
    volumeMounts:
    - mountPath: /log
      name: log-volume
  volumes:
  - name: log-volume
    persistentVolumeClaim:
      claimName: claim-log-1
```

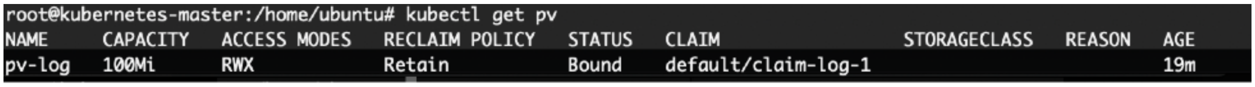
kubectl create -f pod-pvc.yaml



```
root@kubernetes-master:/home/ubuntu# kubectl create -f pod-pvc.yaml
pod/webapp created
```

Validate that PV has been Claimed from Pod

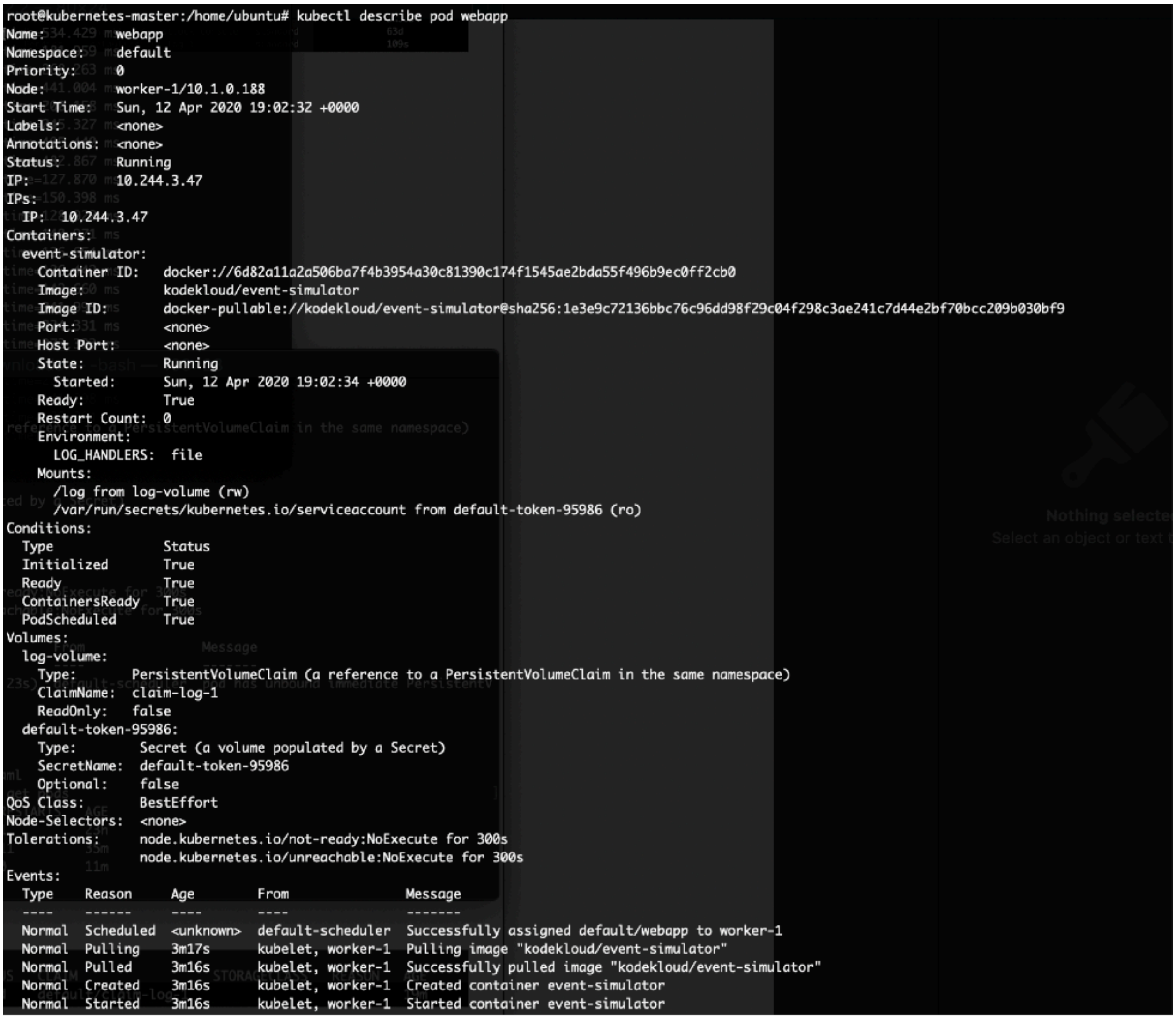
kubectl get pv



```
root@kubernetes-master:/home/ubuntu# kubectl get pv
NAME     CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM                 STORAGECLASS   REASON   AGE
pv-log   100Mi      RWX            Retain           Bound    default/claim-log-1                           19m
```

Validate Pod has the PVC mounted

Kubectl describe pod webapp



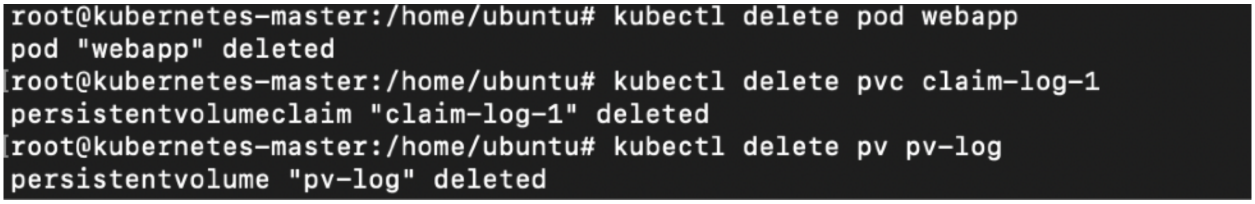
```
root@kubernetes-master:/home/ubuntu# kubectl describe pod webapp
Name:         webapp
Namespace:    default
Priority:     0
Node:         worker-1/10.1.0.188
Start Time:   Sun, 12 Apr 2020 19:02:32 +0000
Labels:       <none>
Annotations:  <none>
Status:       Running
IP:           10.244.3.47
IPs:
  IP:  10.244.3.47
Containers:
  event-simulator:
    Container ID:   docker://6d82a11a2a506ba7f4b3954a30c81390c174f1545ae2bda55f496b9ec0ff2cb0
    Image:          kodekloud/event-simulator
    Image ID:       docker-pullable://kodekloud/event-simulator@sha256:1e3e9c72136bbc76c96dd98f29c04f298c3ae241c7d44e2bf70bcc209b030bf9
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Sun, 12 Apr 2020 19:02:34 +0000
    Ready:          True
    Restart Count:  0
    Environment:
      LOG_HANDLERS:  file
    Mounts:
      /log from log-volume (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-95986 (ro)
Conditions:
  Type              Status
  Initialized       True
  Ready             True
  ContainersReady   True
  PodScheduled      True
Volumes:
  log-volume:
    Type:       PersistentVolumeClaim (a reference to a PersistentVolumeClaim in the same namespace)
    ClaimName:  claim-log-1
    ReadOnly:   false
  default-token-95986:
    Type:        Secret (a volume populated by a Secret)
    SecretName:  default-token-95986
    Optional:    false
QoS Class:       BestEffort
Node-Selectors:  <none>
Tolerations:     node.kubernetes.io/not-ready:NoExecute for 300s
                 node.kubernetes.io/unreachable:NoExecute for 300s
Events:
  Type    Reason     Age        From               Message
  ----    ------     ----       ----               -------
  Normal  Scheduled  <unknown>  default-scheduler  Successfully assigned default/webapp to worker-1
  Normal  Pulling    3m17s      kubelet, worker-1  Pulling image "kodekloud/event-simulator"
  Normal  Pulled     3m16s      kubelet, worker-1  Successfully pulled image "kodekloud/event-simulator"
  Normal  Created    3m16s      kubelet, worker-1  Created container event-simulator
  Normal  Started    3m16s      kubelet, worker-1  Started container event-simulator
```

Step 5 - Clean the environment

Kubectl delete pod webapp

Kubectl delete pvc claim-log-1

Kubectl delete pv pv-log



```
root@kubernetes-master:/home/ubuntu# kubectl delete pod webapp
pod "webapp" deleted
[root@kubernetes-master:/home/ubuntu# kubectl delete pvc claim-log-1
persistentvolumeclaim "claim-log-1" deleted
[root@kubernetes-master:/home/ubuntu# kubectl delete pv pv-log
persistentvolume "pv-log" deleted
```