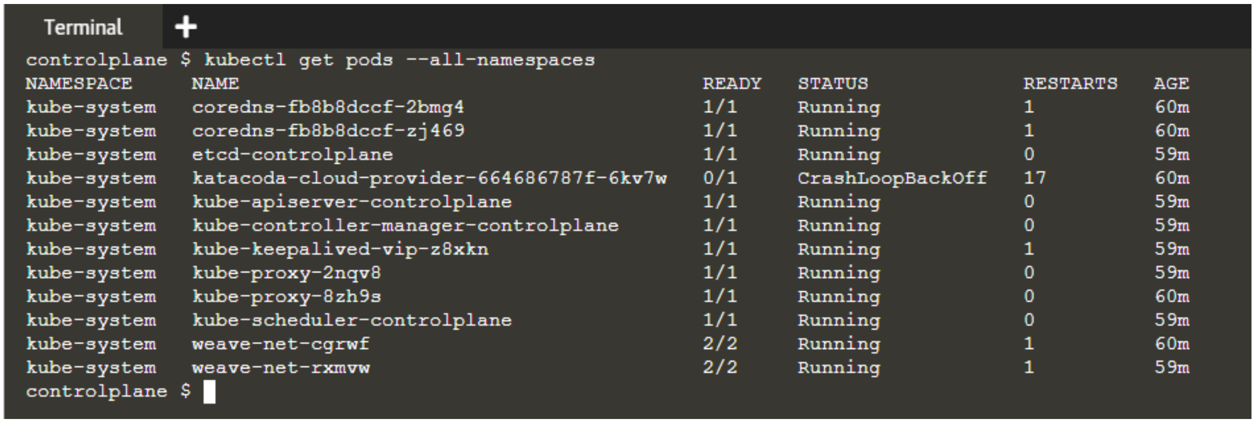
Kubernetes Lab 3

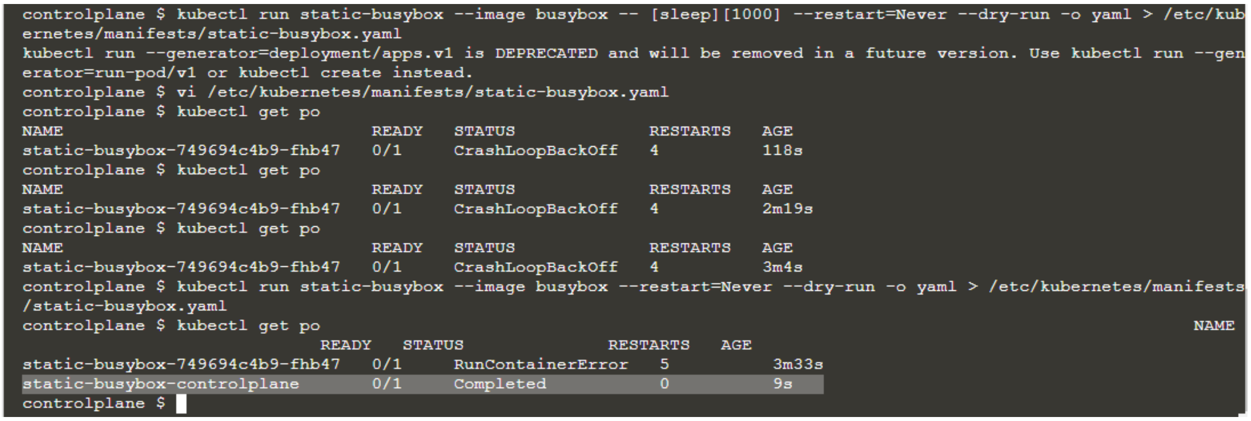
1- How many static pods exist in this cluster in all namespaces?
2-On which nodes are the static pods created currently?



```
controlplane $ kubectl get pods --all-namespaces
NAMESPACE     NAME                                         READY   STATUS             RESTARTS   AGE
kube-system   coredns-fb8b8dccf-2bmg4                      1/1     Running            1          60m
kube-system   coredns-fb8b8dccf-zj469                      1/1     Running            1          60m
kube-system   etcd-controlplane                            1/1     Running            0          59m
kube-system   katacoda-cloud-provider-664686787f-6kv7w     0/1     CrashLoopBackOff   17         60m
kube-system   kube-apiserver-controlplane                  1/1     Running            0          59m
kube-system   kube-controller-manager-controlplane         1/1     Running            0          59m
kube-system   kube-keepalived-vip-z8xkn                    1/1     Running            1          59m
kube-system   kube-proxy-2nqv8                             1/1     Running            0          59m
kube-system   kube-proxy-8zh9s                             1/1     Running            0          60m
kube-system   kube-scheduler-controlplane                  1/1     Running            0          59m
kube-system   weave-net-cgrwf                              2/2     Running            1          60m
kube-system   weave-net-rxmvw                              2/2     Running            1          59m
controlplane $ 
```

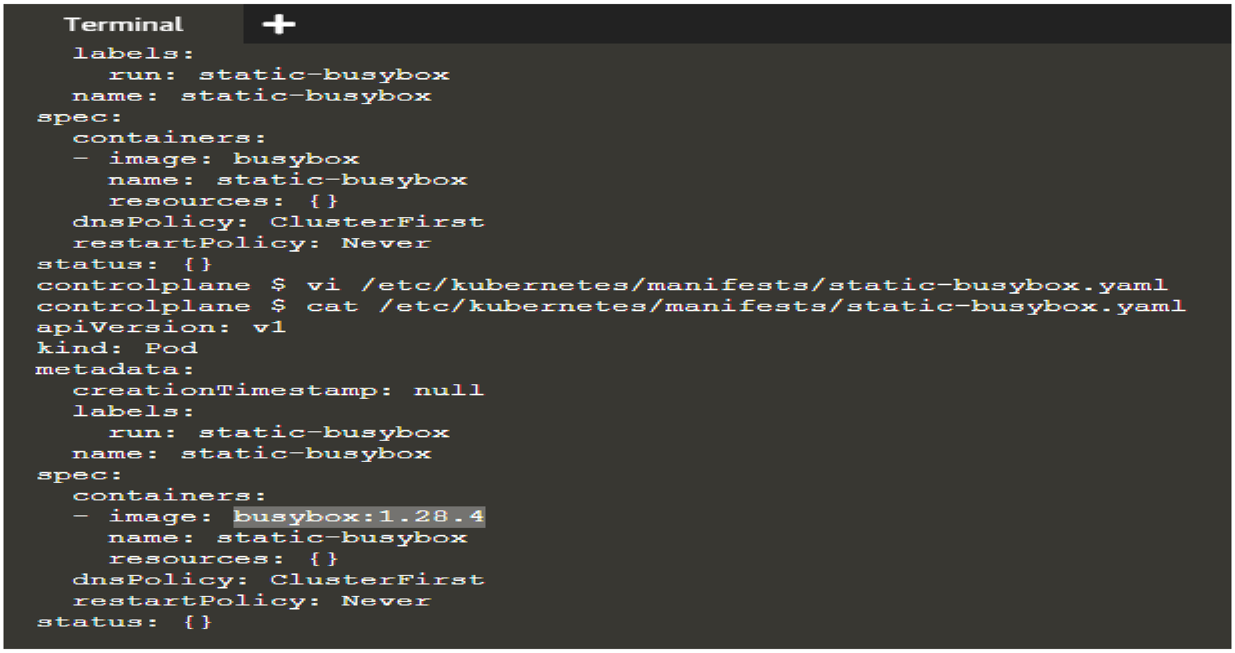
3- What is the path of the directory holding the static pod definition files?
/etc/Kubernetes/manifests

4- Create a static pod named static-busybox that uses the busybox image and the command sleep 1000



```
controlplane $ kubectl run static-busybox --image busybox -- [sleep][1000] --restart=Never --dry-run -o yaml > /etc/kub
ernetes/manifests/static-busybox.yaml
kubectl run --generator=deployment/apps.v1 is DEPRECATED and will be removed in a future version. Use kubectl run --gen
erator=run-pod/v1 or kubectl create instead.
controlplane $ vi /etc/kubernetes/manifests/static-busybox.yaml
controlplane $ kubectl get po
NAME                                READY   STATUS             RESTARTS   AGE
static-busybox-749694c4b9-fhb47     0/1     CrashLoopBackOff   4          118s
controlplane $ kubectl get po
NAME                                READY   STATUS             RESTARTS   AGE
static-busybox-749694c4b9-fhb47     0/1     CrashLoopBackOff   4          2m19s
controlplane $ kubectl get po
NAME                                READY   STATUS             RESTARTS   AGE
static-busybox-749694c4b9-fhb47     0/1     CrashLoopBackOff   4          3m4s
controlplane $ kubectl run static-busybox --image busybox --restart=Never --dry-run -o yaml > /etc/kubernetes/manifests
/static-busybox.yaml
controlplane $ kubectl get po                                                                                    NAME
                             READY   STATUS              RESTARTS   AGE
static-busybox-749694c4b9-fhb47     0/1     RunContainerError   5          3m33s
static-busybox-controlplane         0/1     Completed           0          9s
controlplane $ 
```

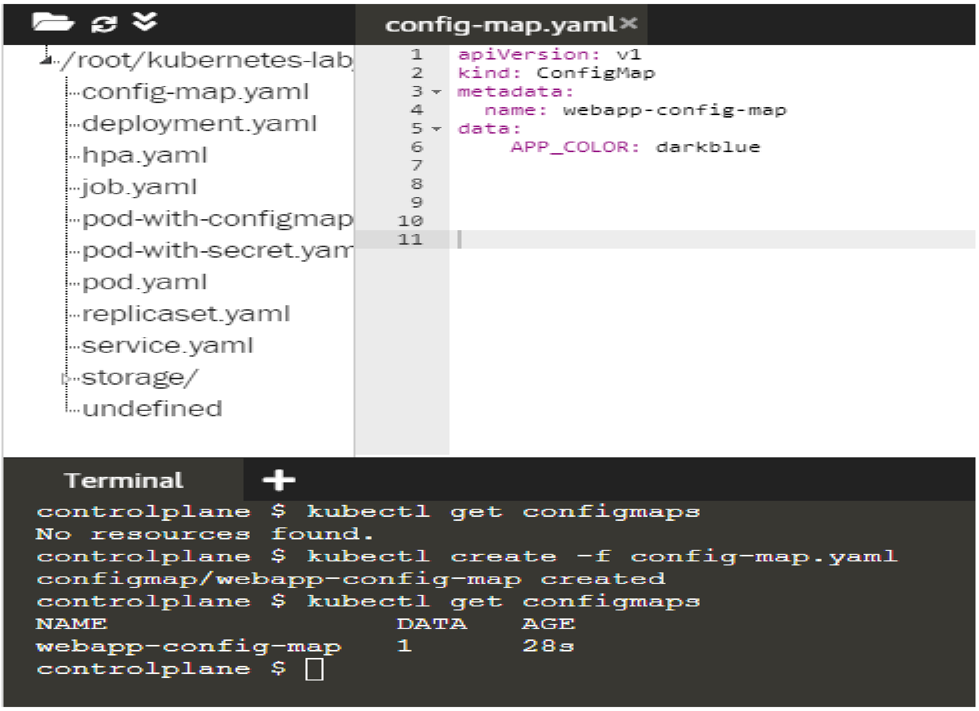
5- Edit the image on the static pod to use busybox:1.28.4



```
  labels:
    run: static-busybox
  name: static-busybox
spec:
  containers:
  - image: busybox
    name: static-busybox
    resources: {}
  dnsPolicy: ClusterFirst
  restartPolicy: Never
status: {}
controlplane $ vi /etc/kubernetes/manifests/static-busybox.yaml
controlplane $ cat /etc/kubernetes/manifests/static-busybox.yaml
apiVersion: v1
kind: Pod
metadata:
  creationTimestamp: null
  labels:
    run: static-busybox
  name: static-busybox
spec:
  containers:
  - image: busybox:1.28.4
    name: static-busybox
    resources: {}
  dnsPolicy: ClusterFirst
  restartPolicy: Never
status: {}
```

6- How many ConfigMaps exist in the environment?

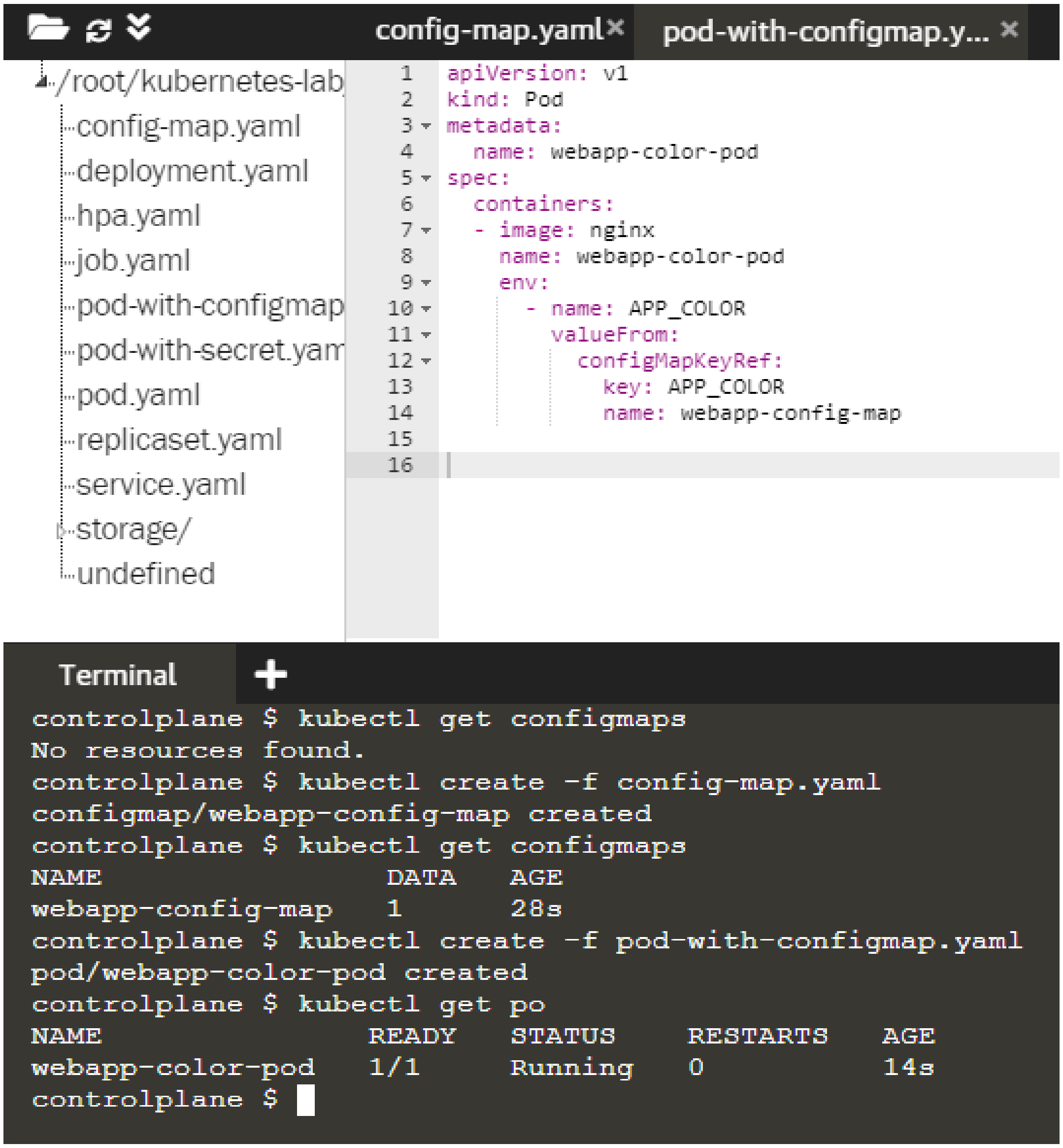
7- Create a new ConfigMap Use the spec given below. ConfigName Name: webapp-config-map Data: APP_COLOR=darkblue



```
apiVersion: v1
kind: ConfigMap
metadata:
  name: webapp-config-map
data:
    APP_COLOR: darkblue
```

```
controlplane $ kubectl get configmaps
No resources found.
controlplane $ kubectl create -f config-map.yaml
configmap/webapp-config-map created
controlplane $ kubectl get configmaps
NAME                DATA      AGE
webapp-config-map   1         28s
controlplane $
```

8- Create a webapp-color POD with nginx image and use the created ConfigMap



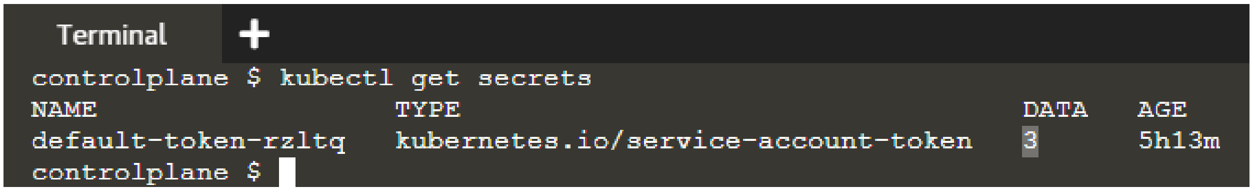
```yaml
apiVersion: v1
kind: Pod
metadata:
  name: webapp-color-pod
spec:
  containers:
  - image: nginx
    name: webapp-color-pod
    env:
      - name: APP_COLOR
        valueFrom:
          configMapKeyRef:
            key: APP_COLOR
            name: webapp-config-map

```

```
controlplane $ kubectl get configmaps
No resources found.
controlplane $ kubectl create -f config-map.yaml
configmap/webapp-config-map created
controlplane $ kubectl get configmaps
NAME                DATA   AGE
webapp-config-map   1      28s
controlplane $ kubectl create -f pod-with-configmap.yaml
pod/webapp-color-pod created
controlplane $ kubectl get po
NAME               READY   STATUS    RESTARTS   AGE
webapp-color-pod   1/1     Running   0          14s
controlplane $
```

9- How many Secrets exist on the system?

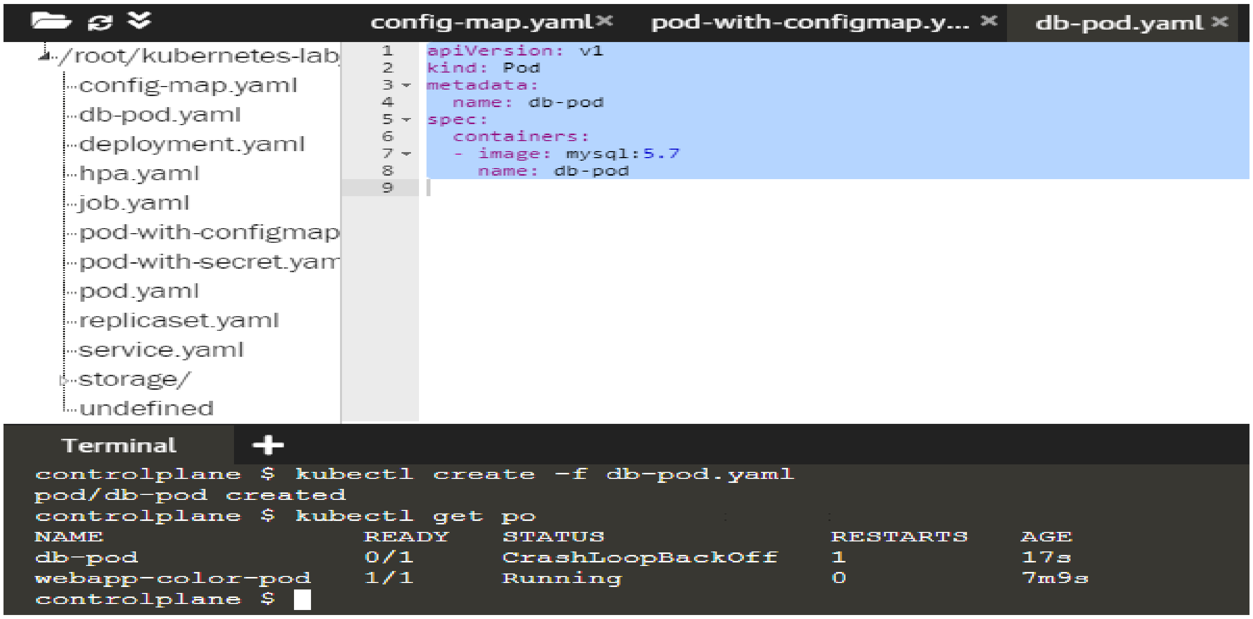
10- How many secrets are defined in the default-token secret?



```
controlplane $ kubectl get secrets
NAME                  TYPE                                  DATA   AGE
default-token-rzltq   kubernetes.io/service-account-token   3      5h13m
controlplane $
```

11- create a POD called db-pod with the image mysql:5.7 then check the POD status

12- why the db-pod status not ready

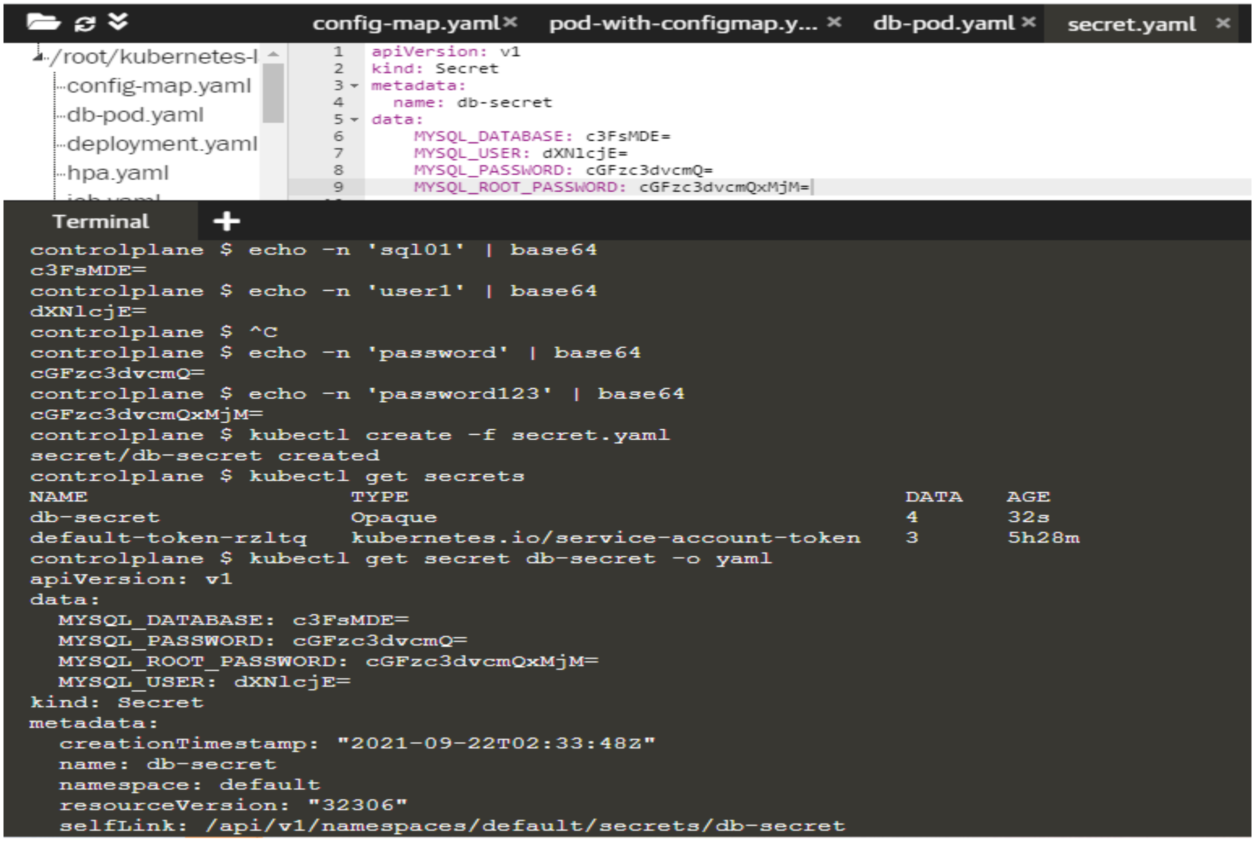


```
apiVersion: v1
kind: Pod
metadata:
  name: db-pod
spec:
  containers:
  - image: mysql:5.7
    name: db-pod

```

```
controlplane $ kubectl create -f db-pod.yaml
pod/db-pod created
controlplane $ kubectl get po
NAME                 READY   STATUS             RESTARTS   AGE
db-pod               0/1     CrashLoopBackOff   1          17s
webapp-color-pod     1/1     Running            0          7m9s
controlplane $
```

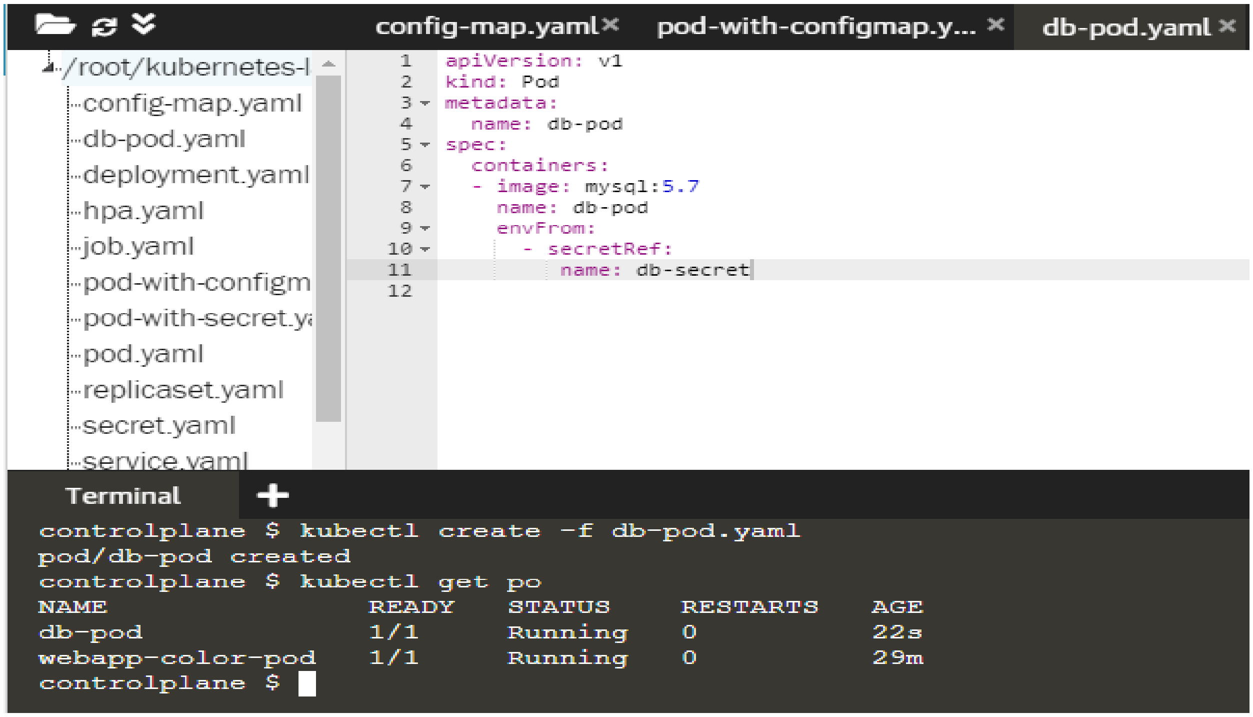
13- Create a new secret named db-secret with the data given below. Secret Name: db-secret Secret 1: MYSQL_DATABASE=sql01 Secret 2: MYSQL_USER=user1 Secret3: MYSQL_PASSWORD=password Secret 4: MYSQL_ROOT_PASSWORD=password123



```
apiVersion: v1
kind: Secret
metadata:
  name: db-secret
data:
    MYSQL_DATABASE: c3FsMDE=
    MYSQL_USER: dXNlcjE=
    MYSQL_PASSWORD: cGFzc3dvcmQ=
    MYSQL_ROOT_PASSWORD: cGFzc3dvcmQxMjM=
```

```
controlplane $ echo -n 'sql01' | base64
c3FsMDE=
controlplane $ echo -n 'user1' | base64
dXNlcjE=
controlplane $ ^C
controlplane $ echo -n 'password' | base64
cGFzc3dvcmQ=
controlplane $ echo -n 'password123' | base64
cGFzc3dvcmQxMjM=
controlplane $ kubectl create -f secret.yaml
secret/db-secret created
controlplane $ kubectl get secrets
NAME                  TYPE                                  DATA   AGE
db-secret             Opaque                                4      32s
default-token-rzltq   kubernetes.io/service-account-token   3      5h28m
controlplane $ kubectl get secret db-secret -o yaml
apiVersion: v1
data:
  MYSQL_DATABASE: c3FsMDE=
  MYSQL_PASSWORD: cGFzc3dvcmQ=
  MYSQL_ROOT_PASSWORD: cGFzc3dvcmQxMjM=
  MYSQL_USER: dXNlcjE=
kind: Secret
metadata:
  creationTimestamp: "2021-09-22T02:33:48Z"
  name: db-secret
  namespace: default
  resourceVersion: "32306"
  selfLink: /api/v1/namespaces/default/secrets/db-secret
```

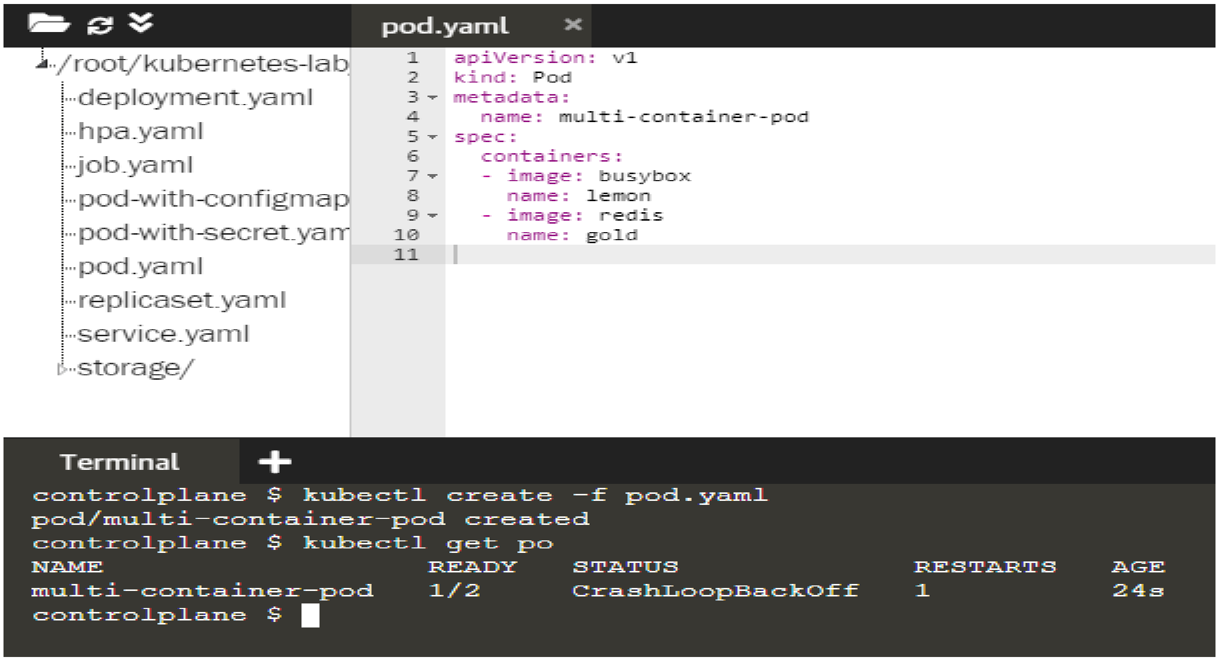
14- Configure db-pod to load environment variables from the newly created secret. Delete and recreate the pod if required.



```
apiVersion: v1
kind: Pod
metadata:
  name: db-pod
spec:
  containers:
  - image: mysql:5.7
    name: db-pod
    envFrom:
      - secretRef:
          name: db-secret
```

```
controlplane $ kubectl create -f db-pod.yaml
pod/db-pod created
controlplane $ kubectl get po
NAME                READY   STATUS    RESTARTS   AGE
db-pod              1/1     Running   0          22s
webapp-color-pod    1/1     Running   0          29m
controlplane $
```

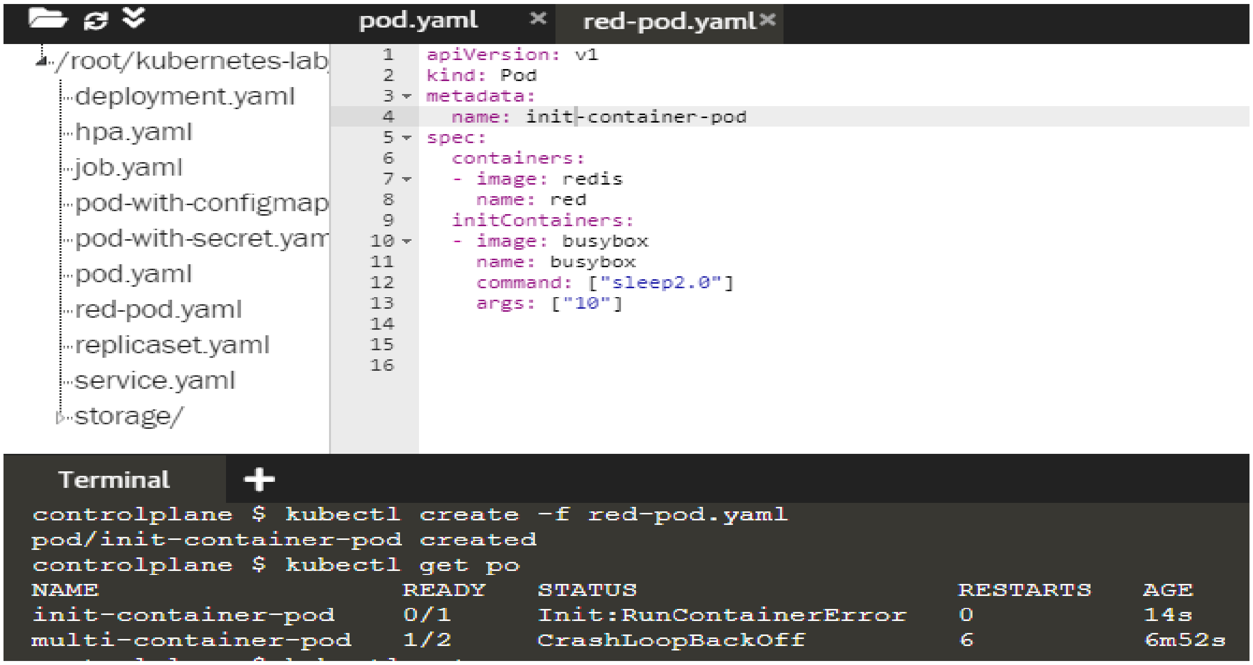
15- Create a multi-container pod with 2 containers. Name: yellow Container 1 Name: lemon Container 1 Image: busybox Container 2 N ame: gold Container 2 Image: redis



```
apiVersion: v1
kind: Pod
metadata:
  name: multi-container-pod
spec:
  containers:
  - image: busybox
    name: lemon
  - image: redis
    name: gold
```

```
controlplane $ kubectl create -f pod.yaml
pod/multi-container-pod created
controlplane $ kubectl get po
NAME                   READY   STATUS             RESTARTS   AGE
multi-container-pod    1/2     CrashLoopBackOff   1          24s
controlplane $
```

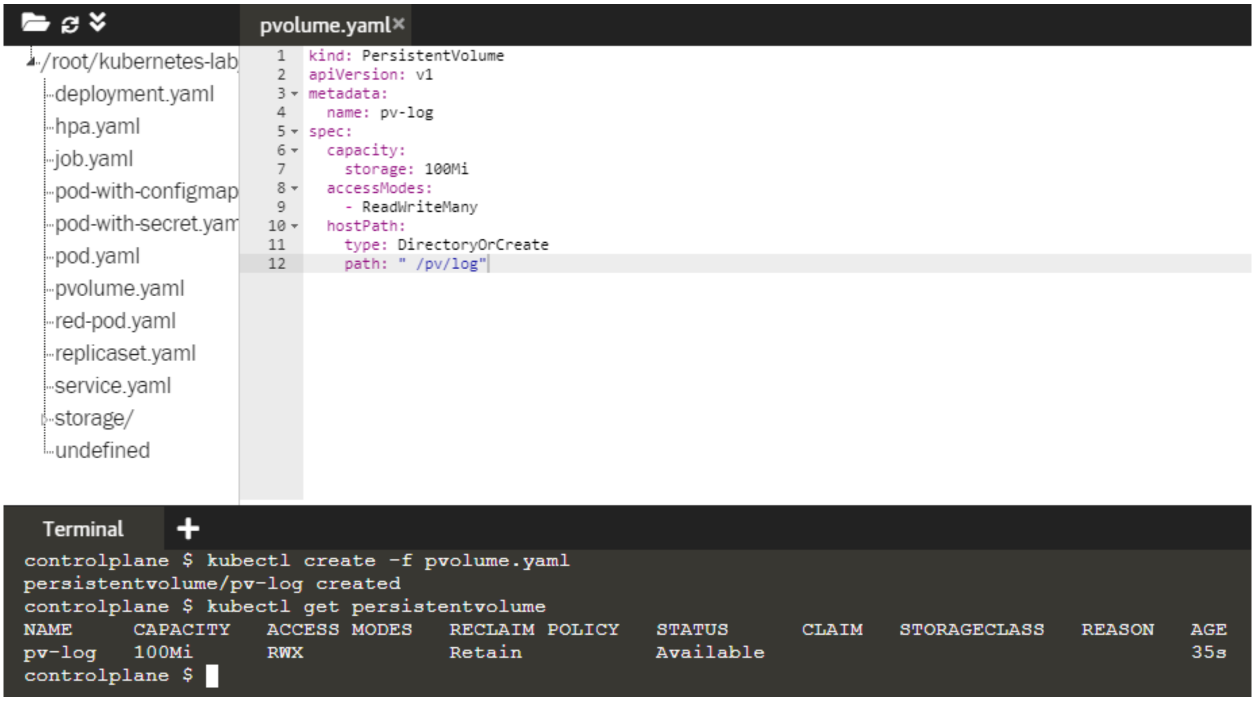
16- Create a pod red with redis image and use an initContainer that uses the busybox image and sleeps for 20 seconds



```yaml
apiVersion: v1
kind: Pod
metadata:
  name: init-container-pod
spec:
  containers:
  - image: redis
    name: red
  initContainers:
  - image: busybox
    name: busybox
    command: ["sleep2.0"]
    args: ["10"]
```

```
controlplane $ kubectl create -f red-pod.yaml
pod/init-container-pod created
controlplane $ kubectl get po
NAME                     READY   STATUS                    RESTARTS   AGE
init-container-pod       0/1     Init:RunContainerError    0          14s
multi-container-pod      1/2     CrashLoopBackOff          6          6m52s
```

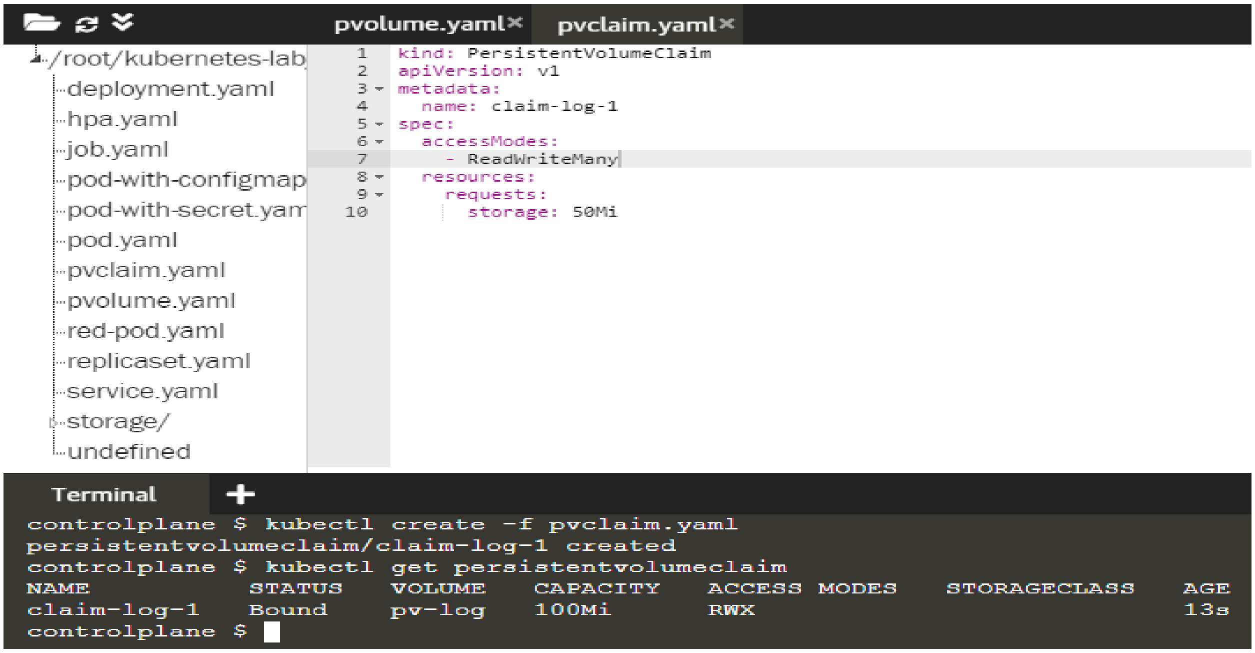
17- Create a Persistent Volume with the given specification. Volume Name: pv-log Storage: 100Mi Access Modes: ReadWriteMany Host Path: /pv/log



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

```
controlplane $ kubectl create -f pvolume.yaml
persistentvolume/pv-log created
controlplane $ kubectl get persistentvolume
NAME     CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS      CLAIM   STORAGECLASS   REASON   AGE
pv-log   100Mi      RWX            Retain           Available                                   35s
controlplane $ █
```

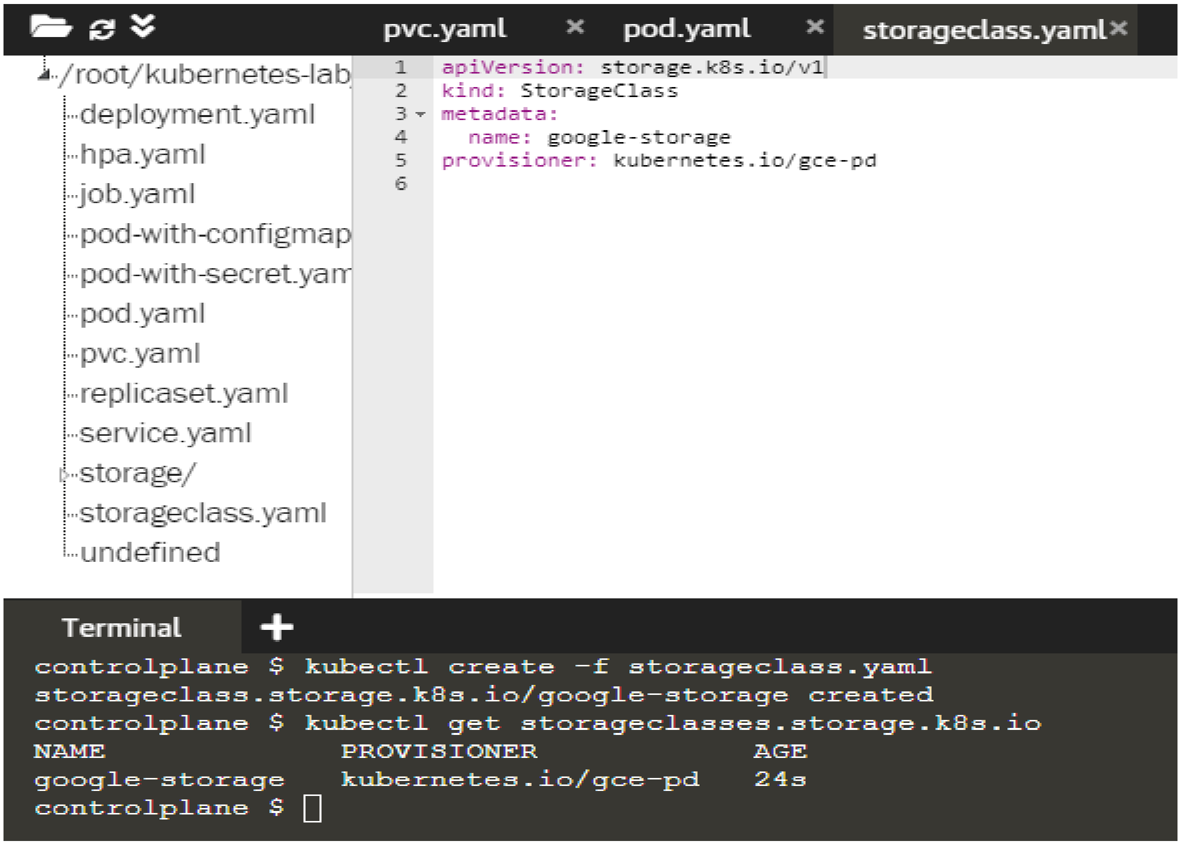
18- Create a Persistent Volume Claim with the given specification. Volume Name: claim-log-1 Storage Request: 50Mi Access Modes: ReadWriteMany



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

```
controlplane $ kubectl create -f pvclaim.yaml
persistentvolumeclaim/claim-log-1 created
controlplane $ kubectl get persistentvolumeclaim
NAME          STATUS   VOLUME   CAPACITY   ACCESS MODES   STORAGECLASS   AGE
claim-log-1   Bound    pv-log   100Mi      RWX                           13s
controlplane $ 
```

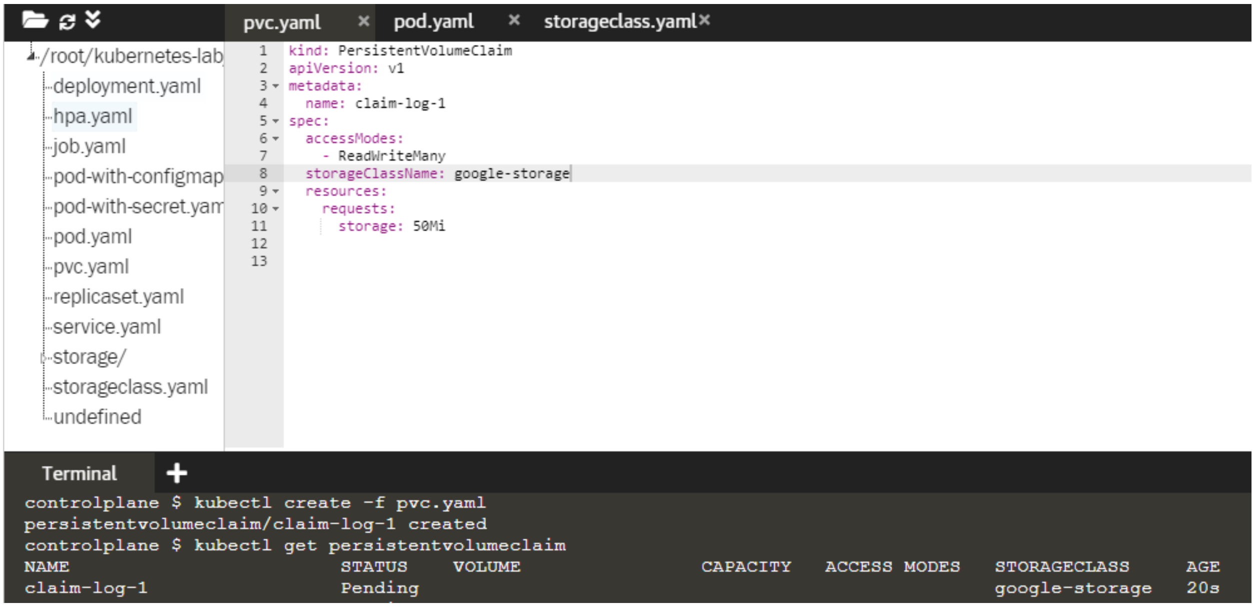
19- Create a webapp pod to use the persistent volume claim as its storage. Name: webapp Image Name: nginx Volume: PersistentVolumeClaim=claim-log-1 Volume Mount: /var/log/nginx



```yaml
apiVersion: storage.k8s.io/v1
kind: StorageClass
metadata:
  name: google-storage
provisioner: kubernetes.io/gce-pd

```

```
controlplane $ kubectl create -f storageclass.yaml
storageclass.storage.k8s.io/google-storage created
controlplane $ kubectl get storageclasses.storage.k8s.io
NAME             PROVISIONER            AGE
google-storage   kubernetes.io/gce-pd   24s
controlplane $ 
```



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


```

```
controlplane $ kubectl create -f pvc.yaml
persistentvolumeclaim/claim-log-1 created
controlplane $ kubectl get persistentvolumeclaim
NAME                         STATUS   VOLUME                CAPACITY   ACCESS MODES   STORAGECLASS     AGE
claim-log-1                  Pending                                                 google-storage   20s
```