K8s Explore Pod Parameters – Extended

🎯 Objective:

- Extend a Pod to use:
  - A PersistentVolumeClaim (PVC)
  - A ConfigMap for configuration
  - A Secret for sensitive values

🛠️ Steps

1. Create a PersistentVolumeClaim

```yaml
# pvc.yaml
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: demo-pvc
spec:
  accessModes:
    - ReadWriteOnce
  resources:
    requests:
      storage: 64Mi
```

Apply it:

2. **Create a ConfigMap**

```yaml
# configmap.yaml
apiVersion: v1
kind: ConfigMap
metadata:
  name: demo-config
data:
  app-mode: "production"
  welcome-msg: "Welcome to NGINX Pod"
```

Apply it:

```
kubectl apply -f configmap.yaml
```

3. **Create a Secret**

```yaml
# secret.yaml
apiVersion: v1
kind: Secret
metadata:
  name: demo-secret
type: Opaque
stringData:
  API_KEY: "abc123supersecret"
```

Apply it:

```
kubectl apply -f secret.yaml
```

4. **Create the updated Pod manifest**

```yaml
# pod-extended.yaml
apiVersion: v1
kind: Pod
metadata:
  name: full-demo-pod
spec:
  containers:
  - name: web
    image: nginx
    ports:
    - containerPort: 80
    env:
    - name: DEMO_MODE
      valueFrom:
        configMapKeyRef:
          name: demo-config
          key: app-mode
    - name: API_KEY
      valueFrom:
        secretKeyRef:
          name: demo-secret
          key: API_KEY
    volumeMounts:
    - name: html
      mountPath: /usr/share/nginx/html
    - name: persistent-data
      mountPath: /mnt/data
  volumes:
  - name: html
    emptyDir: {}
  - name: persistent-data
    persistentVolumeClaim:
      claimName: demo-pvc
  restartPolicy: Always
```

5. Verify resource usage

```
kubectl get pvc demo-pvc
kubectl get configmap demo-config -o yaml
kubectl get secret demo-secret -o yaml
```

6. Inspect environment values inside the container

```
kubectl exec full-demo-pod -- printenv | grep DEMO_MODE
kubectl exec full-demo-pod -- printenv | grep API_KEY
```

7. **Inspect mounted volume from PVC**

```
kubectl exec full-demo-pod -- touch /mnt/data/test.txt
kubectl exec full-demo-pod -- ls /mnt/data
```

8. **Cleanup**

```
kubectl delete pod full-demo-pod
kubectl delete pvc demo-pvc
kubectl delete configmap demo-config
kubectl delete secret demo-secret
```