Kubernetes StatefulSet for Databases

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How to deploy pods into Kubernetes ?

1. **Creating simple Pod object**
   Is not backed by scaleset, not recommended, only for troubleshooting.

2. **Creating DaemonSet**
   Deploys one or multiple pods in each node of the cluster.

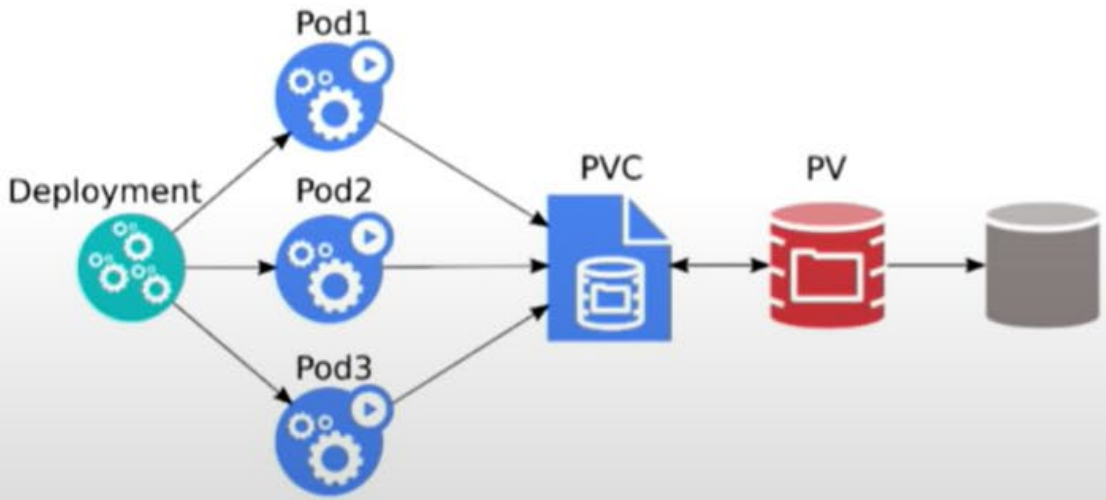
3. **Creating Deployment object**
   Creates N number of replicas, scales using HPA.

4. **Creating StatefulSet**
   Creates N number of replicas for pods and persistent volumes.

Higher Level Workloads

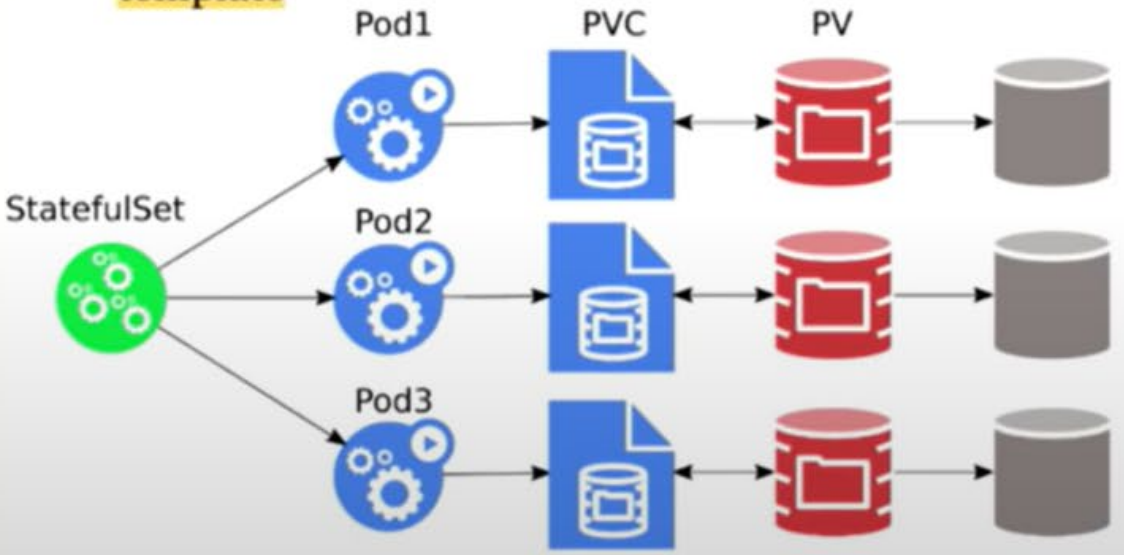
Deployments

- Runs X replicas of a single Pod template
- When a pod is deleted, Deployment automatically creates a new one
- Scalable up and down
- All pods share the same PVC



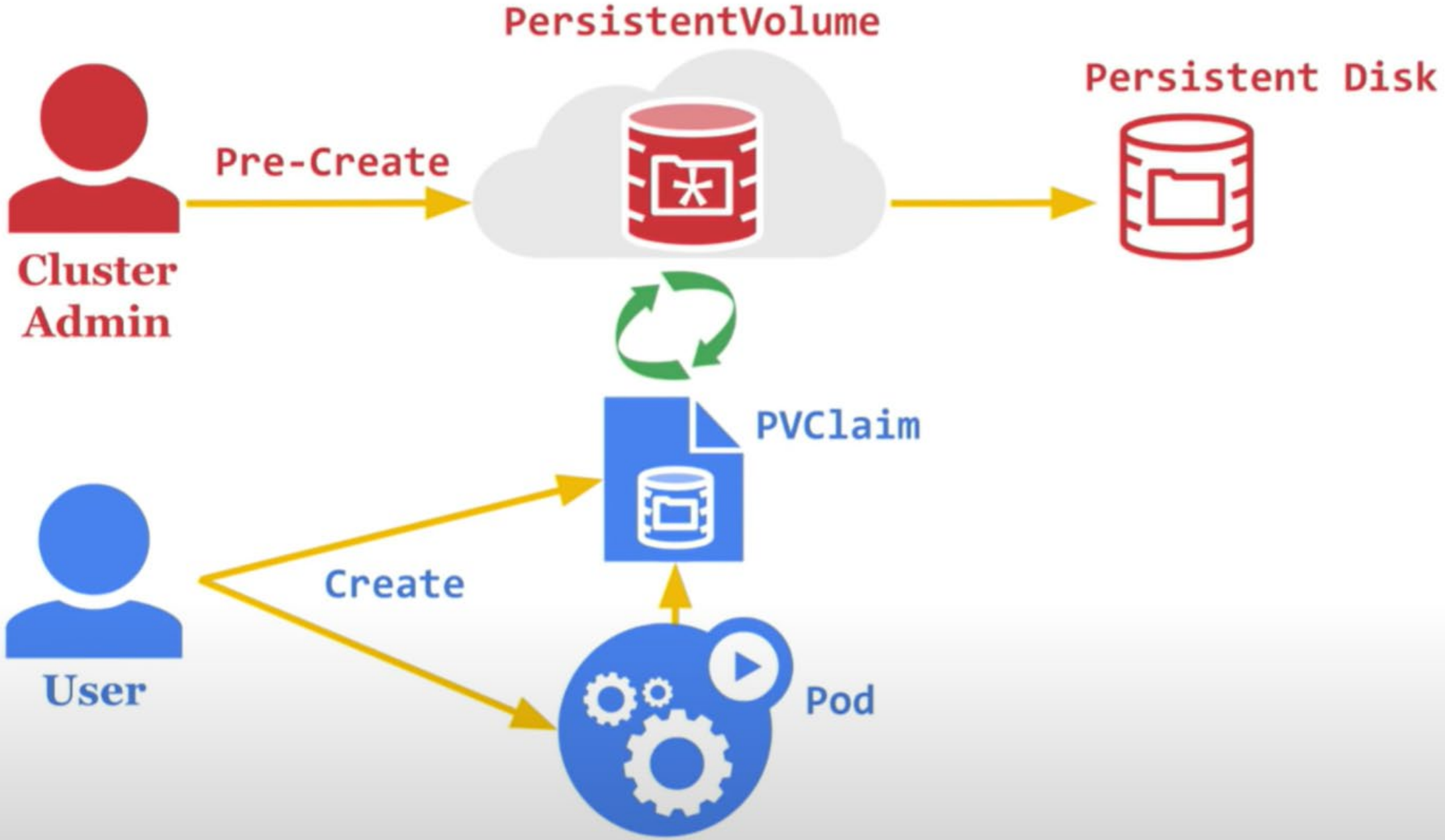
Statefulset

- Runs X replicas of a single Pod template
- When a pod is deleted, StatefulSet automatically creates a new one
- Each pod has a stable identity
- Scalable up and down
- Each pod gets its own PVC(s) from a PVC template



StatefulSet definition

```yaml
apiVersion: apps/v1
kind: StatefulSet
metadata:
  name: db-statefulset
spec:
  serviceName: mssql-service
  replicas: 1
  selector:
    matchLabels:
      app: mssql
  persistentVolumeClaimRetentionPolicy:
    whenDeleted: Delete # Retain
    whenScaled: Delete
  template:
    metadata:
      labels:
        app: mssql
    spec:
      terminationGracePeriodSeconds: 30
      hostname: mssqlinst
      securityContext:
        fsGroup: 10001
      containers:
      - name: mssql
        image: mcr.microsoft.com/mssql/server:latest
        ports:
        - containerPort: 1433
        volumeMounts:
        - name: data
          mountPath: /var/opt/mssql
  volumeClaimTemplates:
  - metadata:
      name: data
    spec:
      accessModes: [ "ReadWriteOnce" ]
      resources:
        requests:
          storage: 1Gi
      storageClassName: managed-csi # default
```


PersistentVolume
Persistent Disk
Pre-Create
Cluster Admin
PVClaim
User
Create
Pod