Implementing Storage in OpenShift Components

Objectives

After completing this section, you should be able to describe how OpenShift implements Ceph storage for each storage-related OpenShift feature.

Implementing Storage in Red Hat OpenShift Container Platform

Red Hat Data Foundation provides the storage infrastructure for Red Hat OpenShift Container Platform. To provide persistent storage resources to developers, OpenShift Container Platform uses Kubernetes object models.

Administrators can use a *StorageClass* resource to describe the storage types and characteristics of the cluster. Administrators can use classes to define storage needs such as QoS levels or provisioner types.

A *PersistentVolume (PV)* or *volume* resource type is a storage element in an OpenShift Container Platform cluster. `PersistentVolume` resources specify the type of disk, level of performance, and storage implementation type. A cluster administrator can manually create these objects, or a `StorageClass` resource can provide them dynamically. Resources, such as pods, can use `PersistentVolume` resources while maintaining lifecycle independence.

A *PersistentVolumeClaim (PVC)* or *claim* is a cluster user storage request from inside a project. `PersistentVolumeClaim` resources contain the requested storage and the required access mode.

> **Note**
>
> The `StorageClass` and `PersistentVolume` resources are cluster resources that are independent of any projects.

The following operations are the most common interactions between a `PersistentVolume` and `PersistentVolumeClaim` resources.

- **Provisioning storage.** In advance, administrators can create `PersistentVolume` resources with different types and sizes for future storage requests. By using a `StorageClass` resource, you can create `PersistentVolumes` resources dynamically PVs have a *reclaim policy*, which is specified in the `reclaimPolicy` field of the class with a value of `Delete` or `Retain`. The default is `Delete`.

  When installing OpenShift Data Foundation, the following storage classes are created:
  - ocs-storagecluster-ceph-rbd
  - ocs-storagecluster-cephfs
  - ocs-storagecluster-ceph-rgw
  - openshift-storage.noobaa.io