You can update the configuration of Rook-Ceph components via CRD updates. Rook-Ceph looks for configuration changes that the service API requested and applies them to the cluster. The cluster state reflects whether the cluster is in the desired state or is approaching it. Important CRDs for the cluster configuration are *CephCluster*, *CephObjectStore*, *CephFilesystem*, and *CephBlockPool*.

Describing the NooBaa operator

NooBaa is a multicloud object storage service that delivers an S3-compatible API in the OpenShift container storage operator bundle. NooBaa provides data placement policies that enable hybrid and multicloud interconnectivity, allowing active/active reads and writes across different clouds.

The NooBaa operator creates and reconciles changes for the NooBaa service and creates the following resources:

- Backing store
- Namespace store
- Bucket class
- Object bucket claims (OBCs)
- Prometheus rules and service monitoring
- Horizontal pod autoscaler (HPA)

NooBaa requires a backing store resource to save objects. A default backing store is created in an OpenShift Data Foundation deployment, but depends on the platform that OpenShift Container Platform is running on. For example, when OpenShift Container Platform or OpenShift Data Foundation is deployed on Amazon Web Services (AWS), it creates the backing store as an AWS::S3 bucket. For Microsoft Azure, the default backing store is a blob container. NooBaa can define multiple, concurrent backing stores.

Red Hat OpenShift Data Foundation installation

Red Hat OpenShift Data Foundation can be deployed in a cloud (AWS, Azure, IBM), or as a virtualized (RHV, VMware vSphere) or bare-metal environment. OpenShift Data Foundation uses the underlying provider's infrastructure to obtain the required resources for the storage cluster. When installing OpenShift Data Foundation, either install the storage cluster in *Internal mode* or use an existing Ceph Storage cluster for *External mode*. Both modes require the installation of the OpenShift Container Storage operator. Differences exist between installing the operator in `Internal` mode and `External` mode.

Internal Installation Mode

The OpenShift Container Storage operator `Internal` mode installation provisions the base services and makes available additional storage classes to applications.

OpenShift Data Foundation pods can be scheduled on the same nodes as application pods or on separate nodes. When using the same nodes, compute and storage resources must be scaled together. When using separate nodes, compute and storage resources scale independently. One `Internal` installation mode benefit is that the OpenShift Container Platform dashboard integrates cluster lifecycle management and monitoring.

The `Internal` installation mode uses the back-end infrastructure to provide storage resources by default. An alternative configuration is to choose the `Internal - Attached Devices` option, which uses the available local storage.

Use of the `Internal - Attached Devices` option has the following requirements:

- The *Local Storage* operator must be installed in the OpenShift cluster.