Managing RADOS Block Devices

Objectives

After completing this section, you should be able to provide block storage to Ceph clients using RADOS block devices (RBDs), and manage RBDs from the command line.

Block Storage Using a RADOS Block Device (RBD)

Block devices are the most common long-term storage devices for servers, laptops, and other computing systems. They store data in fixed-size blocks. Block devices include both hard drives, based on spinning magnetic platters, and solid-state drives, based on nonvolatile memory. To use the storage, format a block device with a file system and mount it on the Linux file system hierarchy.

The *RADOS Block Device (RBD)* feature provides block storage from the Red Hat Ceph Storage cluster. RADOS provides virtual block devices stored as *RBD images* in pools in the Red Hat Ceph Storage cluster.

Managing and Configuring RBD Images

As a storage administrator, use the `rbd` command to create, list, retrieve information from, resize, and remove block device images. The following example procedure creates an RBD image:

- Ensure that the `rbd` pool (or custom pool) for your RBD images exists. Use the `ceph osd pool create` command to create a custom pool to store RBD images. After creating the custom pool, initialize it with the `rbd pool init` command.
- Although Ceph administrators can access the pool, Red Hat recommends that you create a more restricted Cephx user for clients by using the `ceph auth` command. Grant the restricted user read/write access to only the needed RBD pool instead of access to the entire cluster.
- Create the RBD image with the `rbd create --size` *`size pool-name/image-name`* command. This command uses the default pool name if you do not specify a pool name.

The `rbd_default_pool` parameter specifies the name of the default pool used to store RBD images. Use `ceph config set osd rbd_default_pool` *`value`* to set this parameter.

Accessing RADOS Block Device Storage

The kernel RBD client (`krbd`) maps an RBD image to a Linux block device. The `librbd` library provides RBD storage to KVM virtual machines and OpenStack cloud instances. These clients enable bare-metal servers or virtual machines to use the RBD images as normal block-based storage. In an OpenStack environment, OpenStack attaches and maps these RBD images to Linux servers where they can serve as boot devices. Red Hat Ceph Storage disperses the actual storage used by the virtual block devices across the cluster, which provides high performance access using the IP network.

Accessing Ceph Storage with the RBD Kernel Client

Ceph clients can mount an RBD image using the native Linux kernel module, `krbd`. This module maps RBD images to Linux block devices with names such as `/dev/rbd0`.