```
[admin@node ~]# ceph auth get-or-create client.glance mon 'profile rbd' \
osd 'profile rbd pool= images' mgr 'profile rbd pool=images'
```

Image Storage

In OpenStack, the default back end for the `Image` service is a file store that is located with the Glance API node on the controller node. The location is configurable, with a default of `/var/lib/glance`. To improve scalability, the `Image` service implemented an image cache at the default `/var/lib/glance/image-cache/` location on the controller node. When the `Compute` service loads images that are stored in the default QCOW2 format to convert to RAW for use on the compute nodes, then the converted image is cached.

When Red Hat OpenStack Platform is installed with the Swift Object Store, `TripleO` places the image service back end on `Swift` by default. The `Swift` service creates a container called `glance` for storing `Glance` images.

When Ceph storage is integrated into RHOSP, `TripleO` places the image service back end on Ceph RADOS Block Devices (RBD) by default. `Glance` images are stored in a Ceph pool called `images`. RHOSP works with images as immutable blobs and handles them accordingly. The pool name is configurable with the `glance_pool_name` property. The `images` pool is configured as a replicated pool by default, which means that all images are replicated across storage devices for transparent resilience.

An image pool can be configured as erasure-coded to conserve disk space with a slight increase in CPU utilization.

When using Ceph as the storage back end, it is important to disable the image cache, as it is not needed because Ceph expects `Glance` images to be stored in the RAW format. When using RAW images, all image interactions occur within Ceph, including image clone and snapshot creation. Disabling the image cache eliminates significant CPU and network activity on controller nodes.

When using a distributed architecture with Distributed Compute Nodes (DCN), `TripleO` can configure the Image service with an image pool at each remote site. You can copy images between the central (hub) site and the remote sites. The DCN Ceph cluster uses RBD technologies, such as copy-on-write and snapshot layering, for fast instance launching. The `Image`, `Block Storage`, and `Compute` services must all be configured to use Ceph RBD as their back-end storage.

Object Storage

Object storage is implemented in OpenStack by the `Object Store` service (Swift). The `Object Store` service implements both the Swift API and the Amazon S3 API. The default storage back end is file-based, and uses an XFS-formatted partition mount in subdirectories of `/srv/node` on the designated storage node. You can also configure the `Object Store` service to use an existing, external `Swift` cluster as a back end.

When Ceph storage is integrated into RHOSP, `TripleO` configures the `Object Store` service to use the `RADOS Gateway` (RGW) as the back end. Similarly, the `Image` service is configured for RGW because Swift would not be available as a back end.

The `Ceph Object Gateway` can be integrated with the `Keystone` identity service. This integration configures RGW to use the `Identity` service as the user authority. If `Keystone` authorizes a user to access the gateway, then the user is also initially created on the Ceph Object Gateway. Identity tokens that `Keystone` validates are considered valid by the `Ceph Object Gateway`. The `Ceph Object Gateway` is also configured as an object-storage endpoint in `Keystone`.