Installing Ceph

Contents

Installing Ceph..... 3

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This page describes configuration, installation, and the integration of Ceph Block Storage with HP Helion OpenStack 2.0. It also provides the procedure to perform Ceph operation after Ceph deployment.

Prerequisite

The deployer node must be setup before deploying Ceph. For more details on the installation of deployer node, refer to *installation guide*.

Installation Procedure

Perform the following procedures to configuration, installation, and the integration of Ceph Block Storage with HP Helion OpenStack 2.0

1. Login to the Deployer node.
2. Copy `helion/examples/` in the Deployed node.

```
cp -r ~/helion/examples/ ~/helion-input/my_cloud/definition
```

3. List the folder in `~/helion-input/my_cloud/definition`.

   The configuration files for editing are available at `~/helion/my_cloud/definition/data`.
4. Edit the configuration files, based on your environment, to implement Ceph servers.
5. Execute the following command to ensure that the additional disks are available on the servers marked for OSD as specified in the `disks_osd.yml`.

```
vi disks_osd.yml
```

   The sample file of `disks_osd.yml` is as follows:

```
  disk-models:
  - name: DISK_SET_OSD
    # two disk node; remainder of disk 1 and all of disk 2 combined in
 single VG
    # VG is used to create three logical vols for /var, /var/log, and /
var/crash
    device-groups:
      - name: ceph-osd-data-and-journal
        devices:
          - name: /dev/sdb
        consumer:
           name: ceph
           attrs:
             usage: data
             journal_disk: /dev/sdc
      - name: ceph-osd-data-and-shared-journal-set-1
        devices:
          - name: /dev/sdd
        consumer:
           name: ceph
           attrs:
             usage: data
             journal_disk: /dev/sdf
      - name: ceph-osd-data-and-shared-journal-set-2
        devices:
          - name: /dev/sde
        consumer:
           name: ceph
```

```
            attrs:
              usage: data
              journal_disk: /dev/sdf
```

The above sample file contains three OSD nodes and two journal disk.

The disk model has the following fields:

device-groups	There can be several device groups. This allows different sets of disks to be used for different purposes.
name	This is an arbitrary name for the device group. The name must be unique.
devices	This is a list of devices allocated to the device group. A `name` field containing `/dev/sdb`, `/dev/sdd`, and `/dev/sde` indicates that the device group is used by Ceph.
consumer	This specifies the service that uses the device group. A `name` field containing **ceph** indicates that the device group is used by Ceph.
attrs	This is the list of attributes.
usage	There can be several use of devices for a particular service. In the above sample, `usage` field contains **data** which indicates that the device is used for data storage.
journal_disk	It is to used to capture journal data. You can share the journal disk between two nodes.

Important: Minimum 3 OSD nodes are required to configure Ceph.

6. Commit your configuration to a *local repository*:

```
cd ~/helion/hos/ansible
git add -A
git commit -m "<commit message>"
```

Note: Enter your commit message <commit message>

7. Run the configuration processor

```
cd ~/helion/hos/ansible
ansible-playbook -i hosts/localhost config-processor-run.yml
```

8. Use `ansible-playbook -i hosts/localhost ready-deployment.yml` file to create a deployment directory.
9. Run `verb_host` commands from the following directory:

```
 ~/scratch/ansible/next/hos/ansible
```

10. Modify `./helion/hlm/ansible/hlm-deploy.yml` to uncomment the line containing `ceph-deploy.yml`.
11. Run the following ansible playbook:

```
ansible-playbook -i hosts/verb_hosts site.yml
```

Ceph Monitor service is deployed on the Controller Nodes and OSD's are deployed as separate nodes (Resource Nodes).

Run Ceph Client Packages

Execute the following command to install the ceph client packages on controller nodes and create users and ceph pools on the resource nodes:

```
cd ~/scratch/ansible/next/hos/ansible
ansible-playbook -i hosts/verb_hosts ceph-client-prepare.yml
```

Configure Ceph as a Cinder backend

Perform the following procedure on the Deployer node to configure Ceph as a Cinder backend:

1. Edit `~/helion/hos/ansible/roles/_CND-CMN/templates/cinder.conf.j2` to add ceph configuration data as shown below:

   ```
   enabled_backends=ceph1
   ```

2. Copy the following configurations:

   ```
   [ceph1]
   rbd_max_clone_depth = 5
   rbd_flatten_volume_from_snapshot = False
   rbd_uuid = 457eb676-33da-42ec-9a8c-9293d545c337
   rbd_user = cinder
   rbd_pool = volumes
   rbd_ceph_conf = /etc/ceph/ceph.conf
   volume_driver = cinder.volume.drivers.rbd.RBDDriver
   volume_backend_name = ceph
   ```

   Note: The **rbd_uuid** is available in `/home/stack/helion/hos/ansible/roles/ceph-client-prepare/vars/ceph_user_model.yml`

3. Modify `cinder.conf.j2` at `~/helion/hos/ansible/roles/_CND-CMN/templates/cinder.conf.j2` with the following values:

   ```
   backup_driver = cinder.backup.drivers.ceph
   backup_ceph_conf = /etc/ceph/ceph.conf
   backup_ceph_user = cinder-backup
   backup_ceph_chunk_size = 134217728
   backup_ceph_pool = backups
   backup_ceph_stripe_unit = 0
   backup_ceph_stripe_count = 0
   restore_discard_excess_bytes = true
   ```

4. On all the Controller nodes copy the following packages:

   ```
   cp /usr/lib/python2.7/dist-packages/rbd.py /opt/stack/venv/
   cinder-20150827T030317Z/lib/python2.7/site-packages/
   cp /usr/lib/python2.7/dist-packages/rados.py /opt/stack/venv/
   cinder-20150827T030317Z/lib/python2.7/site-packages/
   ```

   Important: Beta1 does not support the RBD volume attachment to a Nova instance.

5. Copy `ceph.client.cinder.keyring` to the controller nodes:

   a. Login to controller node as a root user and execute the following command.

      ```
      ceph auth get-or-create client.cinder | tee /etc/ceph/
      ceph.client.cinder.keyring
      ```

      OR

You can execute the following command from the deployer node.

```
cp /etc/ceph/ceph.client.cinder.keyring to the /etc/ceph folder on the
 controller nodes.
```

6. Commit your configuration to the local repository to configure cinder on the deployer node

```
cd /home/stack/helion/hos/ansible
git add -A
git commit -m "<your commit message>"
```

Note: Enter your commit message <commit message>

7. Use `ansible-playbook -i hosts/localhost ready-deployment.yml` file to create a deployment directory.
8. Run `verb_host` commands from the following directory:

```
 ~/scratch/ansible/next/hos/ansible
```

9. Run the following ansible playbook:

```
ansible-playbook -i hosts/verb_hosts cinder-reconfigure.yml
```

Once cinder is configured, launch the Horizon dashboard to create a cinder volume type.

Creating Cinder Volume Type

To create a volume type using the Horizon dashboard, do the following:

1. Log into the Horizon dashboard. The Horizon dashboard displays with the options in the left panel.
2. From the left panel, click the **Admin** tab and then click the **Volumes** tab to display the Volumes page.
3. Click **Create Volume Type** to display a dialog box.
4. Enter the name of the volume type.
5. Click **Create Volume Type**. The newly created volume displays in the Volumes page.

Associate the volume type to a backend

To map a volume type to a backend, do the following:

1. Login to the Overcloud Horizon dashboard. The Overcloud dashboard displays with the options in the left panel.
2. From the left panel, click the **Admin** tab and then click the **Volumes** tab to display the Volumes page.
3. Click **View Extra Specs** displayed against the volume type which you want to associate to the backend.

   The **Create Volume Type Extra Specs** dialog box displays.
4. In the **Key** box, enter *volume_backend_name*. This is the name of the key used to specify the storage backend when provisioning volumes of this volume type.
5. In the **Value** box, enter the name of the backend to which you want to associate the volume type. For example:*helion-ceph-cinder*.
6. Click **Create** to create the extra volume type specs.

Note: Once the volume type is mapped to the backend, you can create volumes.

Ceph Operations

After the successful deployment of Ceph, you can perform the following ceph operations:

- Check the status of Ceph OSD and Monitor Services
- Start OSD Nodes and Monitor Services
- Stop OSD Nodes and Monitor Services

Check the status of Ceph OSD and Monitor Services

Perform the following steps to check the stays of Ceph OSD Nodes and Monitor Services:

1. Login to Deployer Node.
2. Execute the following command:

```
cd ~/scratch/ansible/next/hos/ansible
```

3. Run the ansible playbook:

```
ansible-playbook -i hosts/verb_hosts ceph-status.yml
```

Start OSD and Monitor Services

Perform the following steps to start OSD Nodes and Monitor Services:

1. Login to Deployer Node.
2. Execute the following command:

```
cd ~/scratch/ansible/next/hos/ansible
```

3. Run the ansible playbook:

```
ansible-playbook -i hosts/verb_hosts ceph-start.yml
```

Stop OSD Nodes and Monitor Services

Perform the following steps to stop OSD Nodes and Monitor Services:

1. Login to Deployer Node.
2. Execute the following command:

```
cd ~/scratch/ansible/next/hos/ansible
```

3. Run the ansible playbook:

```
ansible-playbook -i hosts/verb_hosts ceph-stop.yml
```