Nodes with higher throughput characteristics, such as 10 Gbps network interfaces and SSDs, recover more quickly than nodes with lower throughput characteristics, such as 1 Gbps network interfaces and SATA drives.

Replacing a Failed OSD

Red Hat Ceph Storage is designed to be self-healing. When a storage device fails, extra data copies on other OSDs backfill automatically to recover the cluster to a healthy state.

When a storage device fails, the OSD status changes to `down`. Other cluster issues, such as a network error, can also mark an OSD as `down`. When an OSD is `down`, first verify if the physical device has failed.

Replacing a failed OSD requires replacing both the physical storage device and the software-defined OSD. When an OSD fails, you can replace the physical storage device and either reuse the same OSD ID or create a new one. Reusing the same OSD ID avoids having to reconfigure the CRUSH map.

If an OSD has failed, use the Dashboard GUI or the following CLI commands to replace the OSD.

To verify that the OSD has failed, perform the following steps.

- View the cluster status and verify that an OSD has failed.

```
[ceph: root@node /]# ceph health detail
```

- Identify the failed OSD.

```
[ceph: root@node /]# ceph osd tree | grep -i down
```

- Locate the OSD node where the OSD is running.

```
[ceph: root@node /]# ceph osd find osd.OSD_ID
```

- Attempt to start the failed OSD.

```
[ceph: root@node /]# ceph orch daemon start OSD_ID
```

If the OSD does not start, then the physical storage device might have failed. Use the `journalctl` command to view the OSD logs or use the utilities available in your production environment to verify that the physical device has failed.

If you have verified that the physical device needs replacement, perform the following steps.

- Temporarily disable scrubbing.

```
[ceph: root@node /]# ceph osd set noscrub ; ceph osd set nodeep-scrub
```

- Remove the OSD from the cluster.

```
[ceph: root@node /]# ceph osd out OSD_ID
```

- Watch cluster events and verify that a backfill operation has started.