PG recovery to begin. If the situation remains unresolved, the PG is inaccessible and I/O requests to the PG hang.

By default, Ceph performs an automatic recovery. If recovery fails for any PGs, the cluster status continues to display HEALTH_ERR.

Ceph can declare that an OSDs or a PG is lost, which might result in data loss. To determine the affected OSDs, first retrieve an overview of cluster status with the `ceph health detail` command. Then, use the `ceph pg dump_stuck` *option* command to inspect the state of PGs.

> **Note**
>
> If many PGs remain in the `peering` state, the `ceph osd blocked-by` command displays the OSD that is preventing the OSD peering.

Inspect the PG using either the `ceph pg dump | grep` *pgid* or the `ceph pg query` *pgid* command. The OSDs hosting the PG are displayed in square brackets ([]).

To mark a PG as lost, use the `ceph pg` *pgid* `mark_unfound_lost revert|delete` command. To mark an OSD as lost, use the `ceph osd lost` *osdid* `--yes-i-really-mean-it` command. The state of the OSD must be `down` and `out`.

Upgrading the Cluster

Use the `ceph orch upgrade` command to upgrade your Red Hat Ceph Storage 5 cluster.

First, update `cephadm` by running the `cephadm-ansible` preflight playbook with the `upgrade_ceph_packages` option set to `true`.

```
[root@node ~]# ansible-playbook -i /etc/ansible/hosts/ cephadm-preflight.yml \
--extra-vars "ce ph_origin=rhcs upgrade_ceph_packages=true"
```

Then run the `ceph orch upgrade start --ceph-version` VERSION command using the name of the new version.

```
[ceph: root@node /]# ceph orch upgrade start --ceph-version 16.2.0-117.el8cp
```

Run the `ceph status` command to view the progress of the upgrade.

```
[ceph: root@node /]# ceph status
...output omitted...
progress:
    Upgrade to 16.2.0-115.el8cp (1s)
      [............................]
```

Do not mix clients and cluster nodes that use different versions of Red Hat Ceph Storage in the same cluster. Clients include RADOS gateways, iSCSI gateways, and other applications that use `librados`, `librbd`, or `libceph`.

Use the `ceph versions` command after a cluster upgrade to verify that matching versions are installed.