`crush-compat`
: This mode uses the `compat weight-set` feature to calculate and manage an alternative set of weights for devices in the CRUSH hierarchy. The balancer optimizes these weight-set values, adjusting them up or down in small increments to achieve a distribution that matches the target distribution as closely as possible.

  This mode is fully backwards compatible with older clients.

`upmap`
: The PG `upmap` mode enables storing explicit PG mappings for individual OSDs in the OSD map as exceptions to the normal CRUSH placement calculation. The `upmap` mode analyzes PG placement, and then runs the required `pg-upmap-items` commands to optimize PG placement and achieve a balanced distribution.

  Because these `upmap` entries provide fine-grained control over the PG mapping, the `upmap` mode is usually able to distribute PGs evenly among OSDs, or +/-1 PG if there is an odd number of PGs.

  Setting the mode to `upmap` requires that all clients be `Luminous` or newer. Use the `ceph osd set-require-min-compat-client luminous` command to set the required minimum client version.

Use the `ceph balancer mode upmap` command to set the balancer mode to `upmap`.

```
[ceph: root@node /]# ceph balancer mode upmap
```

Use the `ceph balancer mode crush-compat` command to set the balancer mode to `crush-compat`.

```
[ceph: root@node /]# ceph balancer mode crush-compat
```

Manual Balancing

You can run the `balancer` manually to control when balancing occurs and to evaluate the balancer plan before executing it. To run the balancer manually, use the following commands to disable automatic balancing, and then generate and execute a plan.

- Evaluate and score the current distribution for the cluster.

```
[ceph: root@node /]# ceph balancer eval
```

  Evaluate and score the current distribution for a specific pool.

```
[ceph: root@node /]# ceph balancer eval POOL_NAME
```

- Generate a PG optimization plan and give it a name.

```
[ceph: root@node /]# ceph balancer optimize PLAN_NAME
```

- Display the contents of the plan.

```
[ceph: root@node /]# ceph balancer show PLAN_NAME
```