Performance Counters and Gauges

Each Ceph daemon maintains a set of internal counters and gauges. Several tools are available to access these counters:

The Dashboard plug-in
The Dashboard plug-in exposes a web interface accessible on port 8443. The **Cluster** → **OSDs** menu provides basic real-time OSD statistics, for example, the number of read bytes, write bytes, read operations, and write operations. Enable the Dashboard plug-in by using the `ceph mgr module enable dashboard` command. If you bootstrap your cluster with the `cephadm bootstrap` command, then the dashboard is enabled by default.

The Manager (MGR) Prometheus plug-in
This plug-in exposes the performance metrics on port 9283, for an external Prometheus server to collect. Prometheus is an open source system monitoring and alerting utility.

The ceph command-line tool
The `ceph` command has options to view metrics and change daemon parameters.

Performance Stress Tools

Red Hat Ceph Storage provides tools to stress test and benchmark a Ceph cluster.

The RADOS bench command
RADOS bench is a simple tool for testing the RADOS Object Store. It executes write and read tests on your cluster and provides statistics. The general syntax of the command is:

```
[admin@node ~]$ rados -p pool-name bench seconds write|seq|rand \
-b objsize -t concurrency
```

These are the common parameters for the tool:

- The `seq` and `rand` tests are sequential and random read benchmarks. These tests require that a `write` benchmark is run first with the `--no-cleanup` option. By default, RADOS bench removes the objects created for the writing test. The `--no-cleanup` option keeps the objects, which can be useful for performing multiple tests on the same objects.
- The default object size, `objsize`, is 4 MB.
- The default number of concurrent operations, `concurrency`, is 16.

  With the `--no-cleanup` option, you must manually remove data that remains in the pool after running the `rados bench` command.

  For example, the following information is provided by the `rados bench` command, including throughput, IOPS, and latency:

```
[ceph: root@server /]# rados bench -p testbench 10 write --no-cleanup
hints = 1
Maintaining 16 concurrent writes of 4194304 bytes to objects of size 4194304 for
 up to 10 seconds or 0 objects
Object prefix: benchmark_data_server.example.com_265
  sec Cur ops   started  finished  avg MB/s  cur MB/s last lat(s)  avg lat(s)
    0       0         0         0         0         0           -           0
    1      16        72        56   223.964       224    0.157623    0.241175
...output omitted...
   10      16       715       699   279.551       328    0.120089    0.226616
```