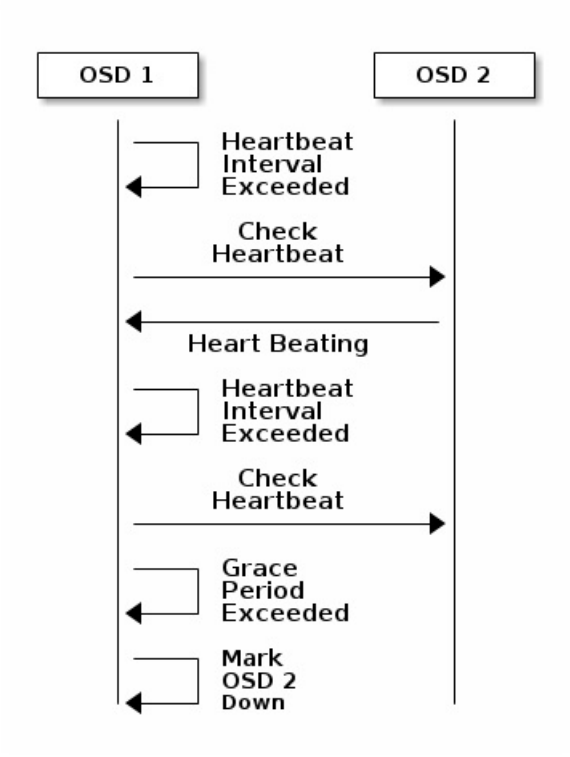
CONFIGURING MONITOR/OSD INTERACTION

After you have completed your initial Ceph configuration, you may deploy and run Ceph. When you execute a command such as `ceph health` or `ceph -s`, the Ceph Monitor reports on the current state of the Ceph Storage Cluster. The Ceph Monitor knows about the Ceph Storage Cluster by requiring reports from each Ceph OSD Daemon, and by receiving reports from Ceph OSD Daemons about the status of their neighboring Ceph OSD Daemons. If the Ceph Monitor doesn't receive reports, or if it receives reports of changes in the Ceph Storage Cluster, the Ceph Monitor updates the status of the Ceph Cluster Map.

Ceph provides reasonable default settings for Ceph Monitor/Ceph OSD Daemon interaction. However, you may override the defaults. The following sections describe how Ceph Monitors and Ceph OSD Daemons interact for the purposes of monitoring the Ceph Storage Cluster.

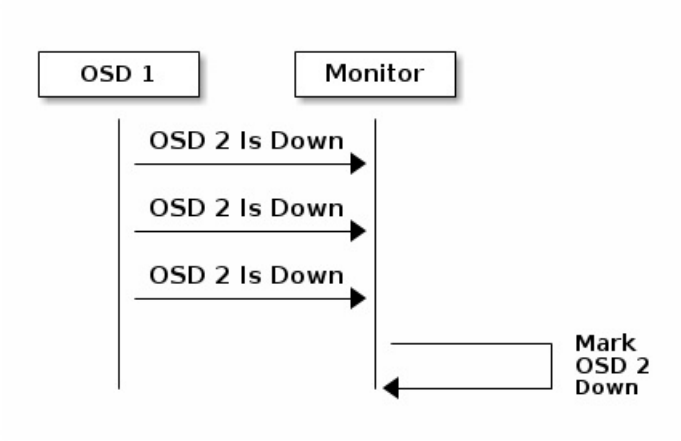
OSDS CHECK HEARTBEATS

Each Ceph OSD Daemon checks the heartbeat of other Ceph OSD Daemons every 6 seconds. You can change the heartbeat interval by adding an `osd heartbeat interval` setting under the `[osd]` section of your Ceph configuration file, or by setting the value at runtime. If a neighboring Ceph OSD Daemon doesn't show a heartbeat within a 20 second grace period, the Ceph OSD Daemon may consider the neighboring Ceph OSD Daemon down and report it back to a Ceph Monitor, which will update the Ceph Cluster Map. You may change this grace period by adding an `osd heartbeat grace` setting under the `[osd]` section of your Ceph configuration file, or by setting the value at runtime.



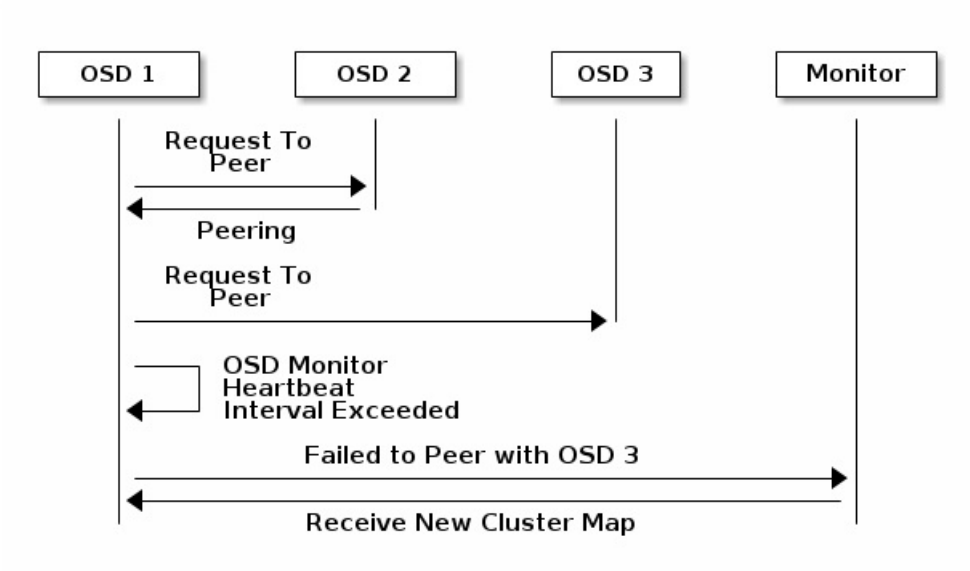
OSDS REPORT DOWN OSDS

By default, a Ceph OSD Daemon must report to the Ceph Monitors that another Ceph OSD Daemon is down three times before the Ceph Monitors acknowledge that the reported Ceph OSD Daemon is down. You can change the minimum number of osd down reports by adding an `mon osd min down reports` setting (`osd min down reports` prior to v0.62) under the `[mon]` section of your Ceph configuration file, or by setting the value at runtime. By default, only one Ceph OSD Daemon is required to report another Ceph OSD Daemon down. You can change the number of Ceph OSD Daemones required to report a Ceph OSD Daemon down to a Ceph Monitor by adding an `mon osd min down reporters` setting (`osd min down reporters'' prior to v0.62) under the ``[mon]` section of your Ceph configuration file, or by setting the value at runtime.



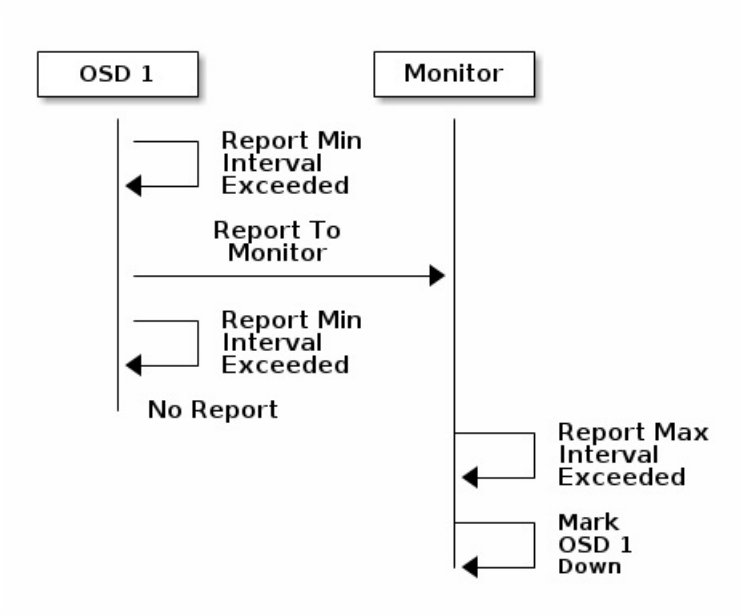
OSDS REPORT PEERING FAILURE

If a Ceph OSD Daemon cannot peer with any of the Ceph OSD Daemons defined in its Ceph configuration file (or the cluster map), it will ping a Ceph Monitor for the most recent copy of the cluster map every 30 seconds. You can change the Ceph Monitor heartbeat interval by adding an `osd mon heartbeat interval` setting under the `[osd]` section of your Ceph configuration file, or by setting the value at runtime.



OSDS REPORT THEIR STATUS

If an Ceph OSD Daemon doesn't report to a Ceph Monitor once at least every 120 seconds, the Ceph Monitor will consider the Ceph OSD Daemon down. You can change the Ceph Monitor report interval by adding an `osd mon report interval max` setting under the `[osd]` section of your Ceph configuration file, or by setting the value at runtime. The Ceph OSD Daemon attempts to report on its status every 30 seconds. You can change the Ceph OSD Daemon report interval by adding an `osd mon report interval min` setting under the `[osd]` section of your Ceph configuration file, or by setting the value at runtime.



CONFIGURATION SETTINGS

When modifying heartbeat settings, you should include them in the `[global]` section of your configuration file.

MONITOR SETTINGS

`mon osd min up ratio`

Description: The minimum ratio of `up` Ceph OSD Daemons before Ceph will mark Ceph OSD Daemons `down`.
Type: Double
Default: `.3`

`mon osd min in ratio`

Description: The minimum ratio of `in` Ceph OSD Daemons before Ceph will mark Ceph OSD Daemons `out`.
Type: Double
Default: `.3`

`mon osd laggy halflife`

Description: The number of seconds laggy estimates will decay.
Type: Integer
Default: `60*60`

`mon osd laggy weight`

Description: The weight for new samples in laggy estimation decay.
Type: Double
Default: `0.3`

`mon osd adjust heartbeat grace`

Description: If set to `true`, Ceph will scale based on laggy estimations.
Type: Boolean
Default: `true`

`mon osd adjust down out interval`

Description: If set to `true`, Ceph will scaled based on laggy estimations.
Type: Boolean
Default: `true`

`mon osd auto mark in`

Description: Ceph will mark any booting Ceph OSD Daemons as `in` the Ceph Storage Cluster.
Type: Boolean
Default: `false`

`mon osd auto mark auto out in`

Description: Ceph will mark booting Ceph OSD Daemons auto marked `out` of the Ceph Storage Cluster as `in` the cluster.
Type: Boolean
Default: `true`

`mon osd auto mark new in`

Description: Ceph will mark booting new Ceph OSD Daemons as `in` the Ceph Storage Cluster.
Type: Boolean
Default: `true`

`mon osd down out interval`

Description: The number of seconds Ceph waits before marking a Ceph OSD Daemon `down` and `out` if it doesn't respond.
Type: 32-bit Integer
Default: `300`

`mon osd downout subtree limit`

Description: The largest CRUSH unit type that Ceph will automatically mark `out`.
Type: String
Default: `rack`

`mon osd report timeout`

Description: The grace period in seconds before declaring unresponsive Ceph OSD Daemons `down`.
Type: 32-bit Integer
Default: `900`

`mon osd min down reporters`

Description: The minimum number of Ceph OSD Daemons required to report a `down` Ceph OSD Daemon.
Type: 32-bit Integer
Default: 1

`mon osd min down reports`

Description: The minimum number of times a Ceph OSD Daemon must report that another Ceph OSD Daemon is `down`.
Type: 32-bit Integer
Default: 3

OSD SETTINGS

`osd heartbeat address`

Description: An Ceph OSD Daemon's network address for heartbeats.
Type: Address
Default: The host address.

`osd heartbeat interval`

Description: How often an Ceph OSD Daemon pings its peers (in seconds).
Type: 32-bit Integer
Default: 6

`osd heartbeat grace`

Description: The elapsed time when a Ceph OSD Daemon hasn’t shown a heartbeat that the Ceph Storage Cluster considers it down.
Type: 32-bit Integer
Default: 20

`osd mon heartbeat interval`

Description: How often the Ceph OSD Daemon pings a Ceph Monitor if it has no Ceph OSD Daemon peers.
Type: 32-bit Integer
Default: 30

`osd mon report interval max`

Description: The maximum time in seconds for an Ceph OSD Daemon to report to a Ceph Monitor before the Ceph Monitor considers the Ceph OSD Daemon down.
Type: 32-bit Integer
Default: 120

`osd mon report interval min`

Description: The minimum number of seconds for a Ceph OSD Daemon to report to a Ceph Monitor to prevent the Ceph Monitor from considering the Ceph OSD Daemon down.
Type: 32-bit Integer
Default: 5
Valid Range: Should be less than `osd mon report interval max`

`osd mon ack timeout`

Description: The number of seconds to wait for a Ceph Monitor to acknowledge a request for statistics.
Type: 32-bit Integer
Default: 30