Monitoring Ceph Cluster with Ceph Dashboard
Abstract

This guide explains how to use the Red Hat Ceph Storage Dashboard for monitoring and management purposes.
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CHAPTER 1. CEPH DASHBOARD OVERVIEW

As a storage administrator, the Red Hat Ceph Storage Dashboard provides management and monitoring capabilities, allowing you to administer and configure the cluster, as well as visualize information and performance statistics related to it. The dashboard uses a web server hosted by the ceph-mgr daemon.

The dashboard is accessible from a web browser and includes many useful management and monitoring features, for example, to configure manager modules and monitor the state of OSDs.

1.1. PREREQUISITES

- System administrator level experience.

1.2. DASHBOARD COMPONENTS

The functionality of the dashboard is provided by multiple components.

- The Ansible automation application for deployment.
- The embedded dashboard ceph-mgr module.
- The embedded Prometheus ceph-mgr module.
- The Prometheus time-series database.
- The Prometheus node-exporter daemon, running on each node of the storage cluster.
- The Grafana platform to provide monitoring user interface and alerting.

Additional Resources

- For more information, see the Ansible website.
- For more information, see the Prometheus website.
- For more information, see the Grafana website.

1.3. DASHBOARD FEATURES

The Ceph dashboard provides multiple features.

Management features

- **View cluster hierarchy.** You can view the CRUSH map, for example, to determine which node a specific OSD ID is running on. This is helpful if there is an issue with an OSD.
- **Configure manager modules.** You can view and change parameters for ceph manager modules.
- **View and filter logs.** You can view event and audit cluster logs and filter them based on priority, keyword, date, or time range.
- **Toggle dashboard components**: You can enable and disable dashboard components so only the features you need are available.

- **Manage OSD settings**: You can set cluster-wide OSD flags using the dashboard.

- **Viewing Alerts**: The alerts page allows you to see details of current alerts.

- **Quality of Service for images**: You can set performance limits on images, for example limiting IOPS or read BPS burst rates.

### Monitoring features

- **Username and password protection**: You can access the dashboard only by providing a configurable user name and password.

- **SSL and TLS support**: All HTTP communication between the web browser and the dashboard is secured via SSL. A self-signed certificate can be created with a built-in command, but it is also possible to import custom certificates signed and issued by a Certificate Authority (CA).

- **Overall cluster health**: Displays the overall cluster status, storage utilization (for example, number of objects, raw capacity, usage per pool), a list of pools and their status and usage statistics.

- **Hosts**: Provides a list of all hosts associated with the cluster along with the running services and the installed Ceph version.

- **Performance counters**: Displays detailed statistics for each running service.

- **Monitors**: Lists all Monitors, their quorum status and open sessions.

- **Configuration Reference**: Lists all available configuration options, their description and default values.

- **Cluster logs**: Display and filter the cluster’s event and audit logs.

- **View storage cluster capacity**: You can view raw storage capacity of the Red Hat Ceph Storage cluster in the Capacity panels of the Ceph dashboard.

- **Pools**: Lists and manages all Ceph pools and their details. For example: applications, placement groups, replication size, EC profile, CRUSH ruleset, etc.

- **OSDs**: Lists and manages all OSDs, their status and usage statistics as well as detailed information like attributes (OSD map), metadata, performance counters and usage histograms for read/write operations.

- **iSCSI**: Lists all hosts that run the tcmu-runner service, displays all images and their performance characteristics, such as read and write operations or traffic.

- **Images**: Lists all RBD images and their properties such as size, objects, and features. Create, copy, modify and delete RBD images. Create, delete, and rollback snapshots of selected images, protect or unprotect these snapshots against modification. Copy or clone snapshots, flatten cloned images.
The performance graph for I/O changes in the Overall Performance tab for a specific image shows values only after specifying the pool that includes that image by setting the `rbd_stats_pool` parameter in Cluster > Manager modules > Prometheus.

- **Mirroring**: Lists all active sync daemons and their status, pools and RBD images including their synchronization state.

- **Filesystems**: Lists all active Ceph file system (CephFS) clients and associated pools, including their usage statistics.

- **Object Gateway (RGW)**: Lists all active object gateways and their performance counters. Displays and manages (adds, edits, deletes) object gateway users and their details, for example quotas, as well as the users’ buckets and their details, for example, owner or quotas.

**Additional Resources**

- See [Toggling dashboard components on or off](https://redhatcephstorage.github.io/redhat-ceph-storage-dashboard-guide/) in the Red Hat Ceph Storage Dashboard Guide for more information.

### 1.3.1. Toggling dashboard features on or off

You can customize the Red Hat Ceph Storage dashboard components by enabling or disabling features on demand. All features are enabled by default. When disabling a feature, the web-interface elements become hidden and the associated REST API end-points reject any further requests for that feature. Enabling and disabling dashboard features can be done from the command-line interface or the web interface.

**Available features:**

- **Ceph Block Devices:**
  - Image management, `rbd`
  - Mirroring, `mirroring`
  - iSCSI gateway, `iscsi`

- **Ceph Filesystem**, `cephfs`

- **Ceph Object Gateway**, `rgw`

**NOTE**

By default, the Ceph Manager is collocated with the Ceph Monitor.

**NOTE**

You can disable multiple features at once.
IMPORTANT

Once a feature is disabled, it can take up to 20 seconds to reflect the change in the web interface.

Prerequisites

- Installation and configuration of the Red Hat Ceph Storage dashboard software.
- User access to the Ceph Manager node or the dashboard web interface.

Procedure

1. To toggle the dashboard features from the dashboard web interface:
   
   a. From the navigation bar on the dashboard page, navigate to Cluster, then Manager Modules, then click on Dashboard. This opens the Edit Manager module page.
   
   b. From the Edit Manager module page, you can enable or disable the dashboard features by checking or unchecking the selection box next to the feature name.

   ![Edit Manager module](image)

   c. Once the selections have been made, click on the Update button at the bottom of the page.

2. To toggle the dashboard features from the command-line interface:
   
   a. Log in to the Ceph Manager node.
   
   b. List the feature status:
[user@mon ~]$ ceph dashboard feature status

c. Disable a feature:

[user@mon ~]$ ceph dashboard feature disable iscsi

This example disables the Ceph iSCSI gateway feature.

d. Enable a feature:

[user@mon ~]$ ceph dashboard feature enable cephfs

This example enables the Ceph Filesystem feature.

1.4. DASHBOARD ARCHITECTURE

The Dashboard architecture depends on the Ceph manager dashboard plugin and other components. See the diagram below to understand how they work together.
As a system administrator, you can install dashboard and access it for the first time.

Red Hat Ceph Storage is installed graphically using the Cockpit web interface, or on the command line using the Ansible playbooks provided by the ceph-ansible RPM. Cockpit uses the same Ansible playbooks to install Ceph. Those playbooks install dashboard by default. Therefore, whether you directly use the Ansible playbooks, or use Cockpit to install Ceph, dashboard will be installed.

**IMPORTANT**

Change the default dashboard password. By default, the password for dashboard is `p@ssw0rd`, which is insecure. You can change the default password before installing Ceph by updating `dashboard_admin_password` in the `all.yml` Ansible playbook before using the playbooks to install Ceph, or after install using the same playbook, or dashboard itself. For more information, see the Install Guide, Changing the dashboard password using the dashboard, or Changing the dashboard password using Ansible.

### 2.1. INSTALLING DASHBOARD USING COCKPIT

Dashboard is installed by default when using the Cockpit web interface to install Red Hat Ceph Storage. You must set a host with the `Metrics` role for Grafana to be installed on.

**Prerequisites**

- Consult the Installation Guide for full prerequisites. This procedure only highlights the steps relevant to the dashboard install.

**Procedure**

1. On the Hosts page, add a host and set the `Metrics` role.
2. Click Add.

3. Complete the remaining Cockpit Ceph Installer prompts.

4. After the deploy process finishes, click the Complete button at the bottom right corner of the page. This opens a window which displays the output of the command `ceph status`, as well as dashboard access information.
5. At the bottom of the Ceph Cluster Status window, the dashboard access information is displayed, including the URL, user name, and password. Take note of this information.

- For more information, see Installing Red Hat Ceph Storage using the Cockpit Web User Interface in the Installation Guide.

### 2.2. INSTALLING DASHBOARD USING ANSIBLE

Dashboard is installed by default when installing Red Hat Ceph Storage using the Ansible playbooks provided by the ceph-ansible RPM.

**Prerequisites**

- Consult the Installation Guide for full prerequisites. This procedure only highlights the steps relevant to the dashboard install.

**Procedure**

1. Ensure a **[grafana-server]** group with a node defined under it exists in the Ansible inventory file. Grafana and Prometheus are installed on this node.

   ```bash
   [root@jb-ceph4-admin ~]# grep grafana-server /etc/ansible/hosts
   [grafana-server]
   jb-ceph4-mon
   ```

2. In the **all.yml** Ansible playbook, ensure **dashboard_enabled**: has not been set to **False**. There should be a comment indicating the default setting of **True**.

   ```bash
   [root@jb-ceph4-admin ~]# grep "dashboard_enabled" /usr/share/ceph-ansible/group_vars/all.yml
   #dashboard_enabled: True
   ```

3. Complete the rest of the steps necessary to install Ceph as outlined in the Installation Guide.

4. After running **ansible-playbook site.yml** for bare metal installs, or **ansible-playbook site-docker.yml** for container installs, Ansible will print the dashboard access information. Find the dashboard URL, username, and password towards the end of the playbook output:
Take note of the output **You can access your dashboard web UI at** [http://jb-ceph4-mon:8443/](http://jb-ceph4-mon:8443/) **as an 'admin' user with 'p@s0w0rd' password.**

### NOTE

The Ansible playbook does the following:

- Enables the Prometheus module in **ceph-mgr**.
- Enables the dashboard module in **ceph-mgr** and opens TCP port 8443.
- Deploys the Prometheus **node_exporter** daemon to each node in the storage cluster.
  - Opens TCP port 9100.
  - Starts the **node_exporter** daemon.
- Deploys Grafana and Prometheus containers under Docker/systemd on the node under **[grafana-server]** in the Ansible inventory file.
  - Configures Prometheus to gather data from the ceph-mgr nodes and the node-exporters running on each Ceph host
    - Opens TCP port 3000.
    - Creates the dashboard, theme, and user accounts in Grafana.
    - Displays the Ceph Dashboard login page URL.

- For more information, see [Installing a Red Hat Ceph Storage cluster](http://example.com) in the **Installation Guide**.

### 2.3. NETWORK PORT REQUIREMENTS

The dashboard components use certain TCP network ports which must be accessible. By default, the network ports are automatically opened in **firewalld** during installation of Red Hat Ceph Storage. This can be changed by setting **True** to **False** on the **configure_firewall: True** line in the Ansible playbook /usr/share/ceph-ansible/group_vars/all.yml. If you use a firewall other than **firewalld**, ensure the following ports are open.

<p>| Table 2.1. TCP Port Requirements |</p>
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<thead>
<tr>
<th>Port</th>
<th>Use</th>
<th>Node</th>
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</thead>
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<tr>
<td>8443</td>
<td>The dashboard web interface</td>
<td>The Ceph Manager nodes.</td>
</tr>
<tr>
<td>3000</td>
<td>Grafana</td>
<td>The node under [grafana-server] in the Ansible inventory file.</td>
</tr>
<tr>
<td>9090</td>
<td>Basic Prometheus graphs</td>
<td>The node under [grafana-server] in the Ansible inventory file.</td>
</tr>
<tr>
<td>9100</td>
<td>The Prometheus node-exporter daemon</td>
<td>All storage cluster nodes.</td>
</tr>
<tr>
<td>9283</td>
<td>Gathering Ceph data</td>
<td>All Ceph Manager nodes.</td>
</tr>
<tr>
<td>9287</td>
<td>Ceph iSCSI gateway data</td>
<td>All Ceph iSCSI gateway nodes.</td>
</tr>
</tbody>
</table>

**Additional Resources**

- For more information, see the Installation Guide.
- For more information, see Using and configuring firewalls in Configuring and managing networking.

**2.4. ACCESSING DASHBOARD**

Accessing the dashboard allows you to administer and monitor your Red Hat Ceph Storage cluster.

**Prerequisites**

- Successful installation of Red Hat Ceph Storage Dashboard.
- NTP is synchronizing clocks properly.

**NOTE**

A time lag can occur between the dashboard node, cluster nodes, and a browser, when the nodes are not properly synced. Ensure all nodes and the system where the browser runs have time synced by NTP. By default, when Red Hat Ceph Storage is deployed, Ansible configures NTP on all nodes. To verify, for Red Hat Enterprise Linux 7, see Configuring NTP Using ntpd, for Red Hat Enterprise Linux 8, see Using the Chrony suite to configure NTP. If you run your browser on another operating system, consult the vendor of that operating system for NTP configuration information.
NOTE

When using OpenStack Platform (OSP) with Red Hat Ceph Storage, to enable OSP Safe Mode, use one of the following methods. With Ansible, edit the `group_vars/all.yml` Ansible playbook, set `dashboard_admin_user_ro: true` and re-run `ansible-playbook` against `site.yml`, or `site-container.yml`, for bare-metal, or container deployments, respectively. To enable OSP Safe Mode using the `ceph` command, run `ceph dashboard ac-user-set-roles admin read-only`. To ensure the changes persist if you run the `ceph-ansible` Ansible playbook, edit `group_vars/all.yml` and set `dashboard_admin_user_ro: true`.

Procedure

1. Enter the following URL in a web browser:

   ![URL]  
   
   Replace:
   
   - `HOST_NAME` with the host name of the dashboard node.
   - `PORT` with port `8443`  
   
   For example:

   ![URL]

2. On the login page, enter the username `admin` and the default password `p@ssw0rd` if you did not change the password during installation.

   ![Login Page]

3. After logging in, the dashboard default landing page is displayed, which provides a high-level overview of status, performance, and capacity metrics of the Red Hat Ceph Storage cluster.
2.5. CHANGING THE DASHBOARD PASSWORD USING ANSIBLE

By default, the password for accessing dashboard is set to p@ssw0rd.

IMPORTANT

For security reasons, change the password after installation.

You can change the dashboard password using Ansible.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Access to the Ansible administration node.

Procedure

1. Open the Ansible playbook file /usr/share/ceph-ansible/group_vars/all.yml for editing.

2. Uncomment and update the password on this line:

   ```yaml
   #dashboard_admin_password: p@ssw0rd
   ```

   to:

   ```yaml
   dashboard_admin_password: p@ssw0rd
   ```
dashboard_admin_password: NEW_PASSWORD

Replace NEW_PASSWORD with your preferred password.

3. Rerun the Ansible playbook file which deploys or updates the Ceph cluster.
   a. For bare metal installs, use the site.yml playbook:

```
[admin@admin ceph-ansible]$ ansible-playbook -v site.yml
```

b. For container installs, use the site-docker.yml playbook:

```
[admin@admin ceph-ansible]$ ansible-playbook -v site-docker.yml
```

4. Log in using the new password.

Additional Resources

- For more information, see Changing the dashboard password using the dashboard in the Dashboard guide.

### 2.6. CHANGING THE DASHBOARD PASSWORD USING THE DASHBOARD

By default, the password for accessing dashboard is set to p@ssw0rd.

**IMPORTANT**

For security reasons, change the password after installation.

To change the password using the dashboard, also change the dashboard password setting in Ansible to ensure the password does not revert to the default password if Ansible is used to reconfigure the Red Hat Ceph Storage cluster.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.

**Procedure**

1. Update the password in the group_vars/all.yml file to prevent the password from being reset to p@ssw0rd when Ansible is used to reconfigure the Ceph cluster.
   a. Open the Ansible playbook file /usr/share/ceph-ansible/group_vars/all.yml for editing.
   b. Uncomment and update the password on this line:

```
#dashboard_admin_password: p@ssw0rd
```

to:

```
dashboard_admin_password: NEW_PASSWORD
```
Replace NEW\_PASSWORD with your preferred password.

2. Change the password in the dashboard web user-interface.
   a. Log in to the dashboard:
      
      \[\text{http://HOST\_NAME:8443}\]
   
   b. At the top right hand side toolbar, click the dashboard settings icon and then click User management.

   ![User management](image)

   c. Locate the admin user in the Username table and click on admin.

   ![Username table](image)

   d. Above the table title Username, click on the Edit button.

   e. Enter the new password and confirm it by reentering it and click Edit User.
You will be logged out and taken to the log in screen. A notification will appear confirming the password change.

3. Log back in using the new password.

Additional Resources

- For more information, see Changing the dashboard password using Ansible in the Dashboard guide.

### 2.7. ENABLING SINGLE SIGN-ON FOR THE CEPH DASHBOARD

The Ceph Dashboard supports external authentication of users with the Security Assertion Markup Language (SAML) protocol. Before using single sign-On (SSO) with the Ceph dashboard, create the dashboard user accounts and assign the desired roles. The Ceph Dashboard performs authorization of the users and the authentication process is performed by an existing Identity Provider (IdP). Red Hat uses Keycloak to test the dashboard SSO feature.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Installation of the Ceph Dashboard software.
- Launch the Dashboard.
- Root-level access to the Ceph Manager nodes.
- Installation of the following library packages on the Ceph Manager nodes:
  - `python3-saml`
  - `python3-defusedxml`
  - `python3-isodate`
To configure SSO on Ceph Dashboard, run the following command:

1. **Bare-metal** deployments:

   **Syntax**
   ```
   ceph dashboard sso setup saml2 CEPH_DASHBOARD_BASE_URL IDP_METADATA IDP_USERNAME_ATTRIBUTE IDP_ENTITY_ID SP_X_509_CERT SP_PRIVATE_KEY
   ```

   **Example**
   ```
   [root@mon ~]# ceph dashboard sso setup saml2
   http://dashboard_hostname.ceph.redhat.com:8443 idp-metadata.xml username
   http://10.70.59.125:8080/auth/realms/realm_name /home/certificate.txt /home/private-key.txt
   ```

2. **Container** deployments:

   **Syntax**
   ```
   podman exec CEPH_MGR_NODE ceph dashboard sso setup saml2
   CEPH_DASHBOARD_BASE_URL IDP_METADATA IDP_USERNAME_ATTRIBUTE IDP_ENTITY_ID SP_X_509_CERT SP_PRIVATE_KEY
   ```

   **Example**
   ```
   [root@mon ~]# podman exec ceph-mgr-hostname ceph dashboard sso setup saml2
   http://dashboard_hostname.ceph.redhat.com:8443 idp-metadata.xml username
   http://10.70.59.125:8080/auth/realms/realm_name /home/certificate.txt /home/private-key.txt
   ```

**Replace**

- `CEPH_MGR_NODE` with Ceph `mgr` node. For example, `ceph-mgr-hostname`
- `CEPH_DASHBOARD_BASE_URL` with the base URL where Ceph Dashboard is accessible.
- `IDP_METADATA` with the URL to remote or local path or content of the IdP metadata XML. The supported URL types are http, https, and file.
- **Optional**: `IDP_USERNAME_ATTRIBUTE` with the attribute used to get the username from the authentication response. Defaults to `uid`.
- **Optional**: `IDP_ENTITY_ID` with the IdP entity ID when more than one entity ID exists on the IdP metadata.
- **Optional**: `SP_X_509_CERT` with the file path of the certificate used by Ceph Dashboard for signing and encryption.
2. Verify the current SAML 2.0 configuration:
   a. **Bare-metal** deployments:

   Syntax
   
   ```
   ceph dashboard sso show saml2
   ```

   b. **Container** deployments:

   Syntax
   
   ```
   podman exec CEPH_MGR_NODE ceph dashboard sso show saml2
   ```

3. To enable SSO, run the following command:
   a. **Bare-metal** deployments:

   Syntax
   
   ```
   ceph dashboard sso enable saml2
   SSO is "enabled" with "SAML2" protocol.
   ```

   b. **Container** deployments:

   Syntax
   
   ```
   podman exec CEPH_MGR_NODE ceph dashboard sso enable saml2
   SSO is "enabled" with "SAML2" protocol.
   ```

4. Open your dashboard URL. For example:

   ```
   http://dashboard_hostname.ceph.redhat.com:8443
   ```

5. On the SSO page, enter the login credentials. SSO redirects to the dashboard web interface.

**Additional Resources**

- To disable single sign-on, see [Disabling Single Sign-on for the Ceph Dashboard](#) in the [Red Hat Ceph Storage Dashboard Guide](#).

### 2.8. Disabling Single Sign-on for the Ceph Dashboard

You can disable single sign on for Ceph Dashboard.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Installation of the Ceph Dashboard software.
• Launch the Dashboard.

• Root-level access to the Ceph Manager nodes.

• Single sign-on enabled for Ceph Dashboard

• Installation of the following library packages on the Ceph Manager nodes:
  - python3-saml
  - python3-defusedxml
  - python3-isodate
  - python3-xmlsec

Procedure

1. To view status of SSO, run the following command:
   a. **Bare-metal** deployments:
      
      Syntax
      
      ```
      ceph dashboard sso status
      ```
      SSO is “enabled” with “SAML2” protocol.

   b. **Container** deployments:
      
      Syntax
      
      ```
      podman exec CEPH_MGR_NODE ceph dashboard sso status
      ```
      SSO is “enabled” with “SAML2” protocol.

      Replace
      
      • **CEPH_MGR_NODE** with Ceph mgr node. For example, **ceph-mgr-hostname**

2. To disable SSO, run the following command:
   a. **Bare-metal** deployments:
      
      Syntax
      
      ```
      ceph dashboard sso disable
      ```
      SSO is “disabled”.

   b. **Container** deployments:
      
      Syntax
      
      ```
      podman exec CEPH_MGR_NODE ceph dashboard sso disable
      ```
      SSO is “disabled”.

      Replace
- CEPH_MGR_NODE with Ceph mgr node. For example, ceph-mgr-hostname

Additional Resources

- To enable single sign-on, see Enabling Single Sign-on for the Ceph Dashboard in the Red Hat Ceph StorageDashboard Guide.
CHAPTER 3. MONITORING THE CLUSTER

The monitoring functions of the dashboard provide different web pages which update regularly to indicate various aspects of the storage cluster. You can monitor the overall state of the cluster using the landing page, or you can monitor specific functions of the cluster, like the state of block device images.

Additional Resources

- For more information, see Accessing the landing page in the Dashboard guide.
- For more information, see Understanding the landing page in the Dashboard guide.
- For more information, see Monitoring specific functions in the Dashboard guide.

3.1. ACCESSING THE LANDING PAGE

After you log in to the dashboard, the landing page loads.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.

Procedure

1. Log in to the Dashboard:

2. After you log in to the dashboard, the landing page loads:
3. To return to the landing page after viewing other dashboard pages, click Dashboard towards the top left corner of the page:

Additional Resources

- For more information, see Understanding the landing page in the Dashboard guide.
- For more information, see Monitoring specific functions in the Dashboard guide.

3.2. UNDERSTANDING THE LANDING PAGE

The landing page displays an overview of the entire Ceph cluster using individual panels. Each panel displays specific information about the state of the cluster.

Categories

The landing page organizes panels into the following three categories:

1. Status
2. Capacity

3. Performance

Status panels

The status panels display the health of the cluster and host and daemon states.

Cluster Status: Displays the current health status of the Ceph cluster.

Hosts: Displays the total number of hosts in the Ceph storage cluster.

Monitors: Displays the number of Ceph Monitors and the quorum status.

OSDs: Displays the total number of OSDs in the Ceph Storage cluster and the number that are up, and in.

Managers: Displays the number and status of the Manager Daemons.

Object Gateways: Displays the number of Object Gateways in the Ceph storage cluster.

Metadata Servers: Displays the number and status of metadata servers for Ceph Filesystems.

iSCSI Gateways: Displays the number of iSCSI Gateways in the Ceph storage cluster.

Capacity panels

The capacity panels display storage usage metrics.
Raw Capacity: Displays the utilization and availability of the raw storage capacity of the cluster.

Objects: Displays the total number of Objects in the pools and a graph dividing objects into states of Healthy, Misplaced, Degraded, or Unfound.

PG Status: Displays the total number of Placement Groups and a graph dividing PGs into states of Clean, Working, Warning, or Unknown.

Pools: Displays the number of storage pools in the Ceph cluster.

PGs per OSD: Displays the number of Placement Groups per OSD.

Performance panels

The performance panels display information related to data transfer speeds.

Client Read/Write: Displays total input/output operations per second, reads per second, and writes per second.

Client Throughput: Displays total client throughput, read throughput, and write throughput.

Recovery Throughput: Displays the Client recovery rate.

Scrubbing: Displays whether Ceph is scrubbing data to verify its integrity.

Additional Resources

- For more information, see Accessing the landing page in the Dashboard guide.
- For more information, see Monitoring specific functions in the Dashboard guide.
CHAPTER 4. MONITORING SPECIFIC FUNCTIONS

As a storage administrator, you can use Red Hat Ceph Storage Dashboard to monitor specific aspects of the cluster based on type of host, services, data access method, and more.

4.1. MONITORING MONITORS

The Red Hat Ceph Storage Dashboard allows you to view various details about Monitor nodes.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.

Procedure

1. Log in to the Dashboard.

2. On the navigation bar, click Cluster and then click Monitors:

3. The Monitors overview page displays information about the overall monitor status as well as tables of in Quorum and Not in Quorum Monitor nodes:
4. To see the number of open sessions, hover the cursor over the blue dotted trail:

![Open Sessions Table]

5. To see performance counters for any monitor, click its host name:

<table>
<thead>
<tr>
<th>Name</th>
<th>Rank</th>
<th>Public Address</th>
<th>Open Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>magna019</td>
<td>0</td>
<td>10.8.128.19:6789/0</td>
<td></td>
</tr>
<tr>
<td>magna023</td>
<td>1</td>
<td>10.8.128.23:6789/0</td>
<td></td>
</tr>
<tr>
<td>magna030</td>
<td>2</td>
<td>10.8.128.30:6789/0</td>
<td></td>
</tr>
</tbody>
</table>

3 total

6. View the performance counters:

![Performance Counters Table]

**mon.magna019**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>mon.election_call</td>
<td>Elections started</td>
<td>0</td>
</tr>
<tr>
<td>mon.election_lose</td>
<td>Elections lost</td>
<td>0</td>
</tr>
<tr>
<td>mon.election_win</td>
<td>Elections won</td>
<td>0</td>
</tr>
<tr>
<td>mon.num_elections</td>
<td>Elections participated in</td>
<td>0</td>
</tr>
<tr>
<td>mon.num_sessions</td>
<td>Open sessions</td>
<td>18</td>
</tr>
<tr>
<td>mon.session_add</td>
<td>Created sessions</td>
<td>0</td>
</tr>
<tr>
<td>mon.session_rm</td>
<td>Removed sessions</td>
<td>0</td>
</tr>
<tr>
<td>mon.session_trim</td>
<td>Trimmed sessions</td>
<td>0</td>
</tr>
<tr>
<td>paxos.accept_timeout</td>
<td>Accept timeouts</td>
<td>0</td>
</tr>
<tr>
<td>paxos.begin</td>
<td>Started and handled begins</td>
<td>0.6</td>
</tr>
</tbody>
</table>

100 total
4.2. MONITORING POOLS

The Red Hat Ceph Storage Dashboard allows you to view various details about pools in the cluster.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.

Procedure

1. Log in to the Dashboard.
2. On the navigation bar, click Pools:

   ![Dashboard](image)

   **Status**

   **Cluster Status**

   **Hosts**

   **HEALTH OK**

   **5 total**

3. View the pools list:

   ![Pool List](image)

4. Mouse over a usage bar graph to view the actual used and free space:
To view more information about a pool, select it by clicking on its row:

5. View the details of the pool. To view performance details and configuration data for the pool, click on the associated tabs.
7. To view performance data for all the pools, click the Overall Performance tab towards the top left of the page:

8. View the Overall Performance page:
4.3. MONITORING CEPH FILE SYSTEMS

As a storage administrator, you can use the Red Hat Ceph Storage Dashboard to monitor Ceph File Systems (CephFS) and related components.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed
- Ceph File System is installed.

Procedure

1. Log in to the dashboard.

2. On the navigation bar, click Filesystems.
3. In the example below, you can see the cephfs file system.

4. To view details for the file system, click the row for cephfs.

5. On the Details tab, you can see metadata servers and their rank plus any standby daemons, at 1, pools and their usage, at 2, and performance counters at 3.
6. To view the list of clients which have mounted the file system, click the **Clients** tab.
7. In the example below, you can see the `jb-ceph4-client` host has the `cephfs` file system opened.

8. To view the performance of the file system, click the `Performance Details` tab.
In the example below, you can see the read and write operations, at 1, client requests, at 2, and you can change the time range at 3.

Additional Resources
- For more information, see Installing Metadata servers in the Installation Guide.
- For more information, see the File System Guide.
CHAPTER 5. MANAGING THE CLUSTER

5.1. MANAGING THE CLUSTER

The management functions of the dashboard allow you to view and modify configuration settings, and manage cluster resources.

5.2. VIEWING THE CRUSH MAP

The CRUSH map contains a list of OSDs and related information. Together, the CRUSH map and CRUSH algorithm determine how and where data is stored. The Red Hat Ceph Storage dashboard allows you to view different aspects of the CRUSH map, including OSD hosts, OSD daemons, ID numbers, device class, and more.

The CRUSH map allows you to determine which node a specific OSD ID is running on. This is helpful if there is an issue with an OSD.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.

Procedure

1. Log in to the Dashboard.
2. On the navigation bar, click Cluster.
3. Click CRUSH map.

In the above example, you can see the default CRUSH map, three nodes, and OSDs running on two of the three nodes.

4. Click on the CRUSH map name, nodes, or OSDs, to view details about each object.
In the above example, you can see the values of variables related to an OSD running on the `jb-rhel-osd3` node. In particular, note the `id` is 2.

**Additional Resources**

- For more information about the CRUSH map, see [CRUSH administration](#) in the [Storage strategies guide](#).

### 5.3. CONFIGURING MANAGER MODULES

The Red Hat Ceph Storage dashboard allows you to view and configure manager module parameters.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.

**Procedure**

1. Log in to the Dashboard.
2. On the navigation bar, click *Cluster*.
3. Click *Manager modules*:
4. Click on a row for a module you want to configure:

Not all modules have configurable parameters. If a module is not configurable, the Edit button is disabled.

5. Towards the upper left of the page, click the Edit button to load the page with the configurable parameters.
The above screenshot shows parameters that you can change for the balancer module. To display a description of a parameter, click the question mark button.

6. To change a parameter, modify the state of the parameter and click the Update button at the bottom of the page:

A notification confirming the change appears in the upper-right corner of the page:
Additional Resources

- See *Using the Ceph Manager balancer module* in the *Red Hat Ceph Storage Operations Guide*.

### 5.4. FILTERING LOGS

The Red Hat Ceph Storage Dashboard allows you to view and filter logs based on several criteria. The criteria include *priority*, *keyword*, *date*, and *time range*.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- The Dashboard is installed.
- Log entries have been generated since the Monitor was last started.

**NOTE**

The Dashboard logging feature only displays the thirty latest high level events. The events are stored in memory by the Monitor. The entries disappear after restarting the Monitor. If you need to review detailed or older logs, refer to the file based logs. See *Additional Resources* below for more information about file based logs.

**Procedure**

1. Log in to the Dashboard.
2. Click the **Cluster** drop-down menu in the top navigation bar.
3. Click **Logs** in the drop-down menu.

4. View the last thirty unfiltered log entries.
a. To filter by priority, click the **Priority** drop-down menu and select either **Info**, **Warning**, or **Error**. The example below only shows log entries with the priority of **Error**.

b. To filter by keyword, enter text into the **Keyword** form. The example below only shows log entries that include the text **osd.2**.
c. To filter by date, click the Date form and either use the date picker to select a date from the menu, or enter a date in the form of YYYY-MM-DD. The example below only shows log entries with the date of 2019-10-15.

d. To filter by time, enter a range in the Time range fields using the HH:MM - HH:MM format. Hours must be entered using numbers 0 to 23. The example below only shows log entries from 12:14 to 12:23.

e. To combine filters, set two or more filters. The example below only shows entries that have both a Priority of Warning and the keyword of osd.
5.5. CONFIGURING OSD RECOVERY SETTINGS

As a storage administrator, you can change the OSD recovery priority and customize how the cluster recovers. This allows you to influence your cluster’s rebuild performance or recovery speed.

Prerequisites

- A Red Hat Ceph Storage cluster.
- The dashboard is installed.

Procedure

1. Log in to the dashboard.

2. Click the Cluster drop-down menu in the top navigation bar.

3. Click OSDs in the drop-down menu.
4. Click the *Cluster-Wide Flags* drop-down menu.
5. Select **Cluster-wide Recovery Priority** in the drop-down.

![Cluster-wide Recovery Priority dropdown](image)

6. Optional: Select **Priority** in the drop-down menu, and then click the **Submit** button.

**NOTE**

There are 3 predefined options: **Low**, **Default**, **High**
7. Optional: Click *Customize priority values*, make the required changes, and then click the *Submit* button.

8. A notification towards the top right corner of the page pops up indicating the flags were updated successfully.
5.6. MANAGING THE PROMETHEUS ENVIRONMENT

To monitor a Ceph storage cluster with Prometheus you can configure and enable the Prometheus exporter so the metadata information about the Ceph storage cluster can be collected.

Prerequisites

- A running Red Hat Ceph Storage 3.1 or higher cluster.
- Installation of the Red Hat Ceph Storage Dashboard.
- Root-level access to the Red Hat Ceph Storage Dashboard node.

Procedure

1. Open and edit the `/etc/prometheus/prometheus.yml` file.
   a. Under the `global` section, set the `scrape_interval` and `evaluation_interval` options to 15 seconds.

   **Example**
   ```yaml
   global:
   scrape_interval:     15s
   evaluation_interval: 15s
   ```

   b. Under the `scrape_configs` section, add the `honor_labels: true` option, and edit the `targets`, and `instance` options for each of the `ceph-mgr` nodes.

   **Example**
   ```yaml
   scrape_configs:
   - job_name: 'node'
     honor_labels: true
     static_configs:
     - targets: ['node1.example.com:9100']
     labels:
   ```

Additional Resources

- For more information on OSD recovery, see OSD Recovery in the Configuration Guide.
NOTE
Using the **honor_labels** option enables Ceph to output properly-labelled data relating to any node in the Ceph storage cluster. This allows Ceph to export the proper **instance** label without Prometheus overwriting it.

To add a new node, simply add the **targets**, and **instance** options in the following format:

**Example**

```yaml
- targets: ['new-node.example.com:9100']
  labels:
    instance: "new-node"
```

NOTE
The **instance** label has to match what appears in Ceph’s OSD metadata **instance** field, which is the short host name of the node. This helps to correlate Ceph stats with the node’s stats.

2. Add Ceph targets to the `/etc/prometheus/ceph_targets.yml` file in the following format.

**Example**

```yaml
[
  {
    "targets": [ "cephnode1.example.com:9283" ],
    "labels": {}
  }
]
```

3. Enable the Prometheus module:

```bash
[root@mon ~]# ceph mgr module enable prometheus
```

### 5.7. VIEWING AND MANAGING ALERTS

The alerts page allows you to see the details of alerts and create silences for them. Red Hat Ceph Storage includes the following pre-defined alerts:

- OSD(s) Down
- Ceph Health Error
- Ceph Health Warning
- Cluster Capacity Low
- Disk(s) Near Full
- MON(s) Down
- Network Errors
- OSD Host Loss Check
- OSD Host(s) Down
- OSD(s) with High PG Count
- PG(s) Stuck
- Pool Capacity Low
- Slow OSD Responses

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- An alert fired.

**5.7.1. Viewing alerts**

After an alert has fired, you can view it.

**Procedure**

1. Log in to the Dashboard.
2. On the navigation bar, click *Cluster*. 
3. Select Alerts from the drop-down menu.
4. In the example below, you can see an **OSD(s) Down** alert.
5. To view details about the alert, click on its row:

![Alert Details]

To view the source of an alert, click on its row, and then click **Source**.

6. To view the source of an alert, click on its row, and then click **Source**.

### 5.7.2. Creating a silence

You can create a silence to silence an alert for a specified amount of time.

1. Log in to the Dashboard.

2. On the navigation bar, click **Cluster**.
3. Select Alerts from the drop-down menu.
4. In the example below, you can see an **OSD(s) Down** alert.

<table>
<thead>
<tr>
<th>Name</th>
<th>Job</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSD(s) Down</td>
<td>ceph</td>
<td>page</td>
</tr>
</tbody>
</table>

0 selected / 1 total
5. Click on the row for the alert and then click the Create silence button.

6. Add the details and click the Create Silence button.
7. A notification towards the top right corner of the page pops up indicating that the silence was created successfully.

5.7.3. Re-creating a silence

You can re-create an alert silence from an expired silence.

1. Log in to the Dashboard.
2. On the navigation bar, click Cluster.

3. Select Alerts from the drop-down menu.
4. Click the Silences tab.
5. Click on the row for the alert, and then click the **Recreate** button.

6. Add the details and click the **Recreate Silence** button.

7. A notification towards the top right corner of the page pops up indicating that the silence was re-created successfully.
5.7.4. Editing a silence

You can edit an existing alert silence, for example, to extend the time it is active.

1. Log in to the Dashboard.

2. On the navigation bar, click Cluster.

3. Select Alerts from the drop-down menu.

![Dashboard Screenshot](image-url)
4. Click the Silences tab.
5. Click on the row for the alert, and then click the *Edit* button.

6. Edit the details and click the *Edit Silence* button.

7. A notification towards the top right corner of the page pops up indicating that the silence was edited successfully.
5.7.5. Expiring a silence

You can expire a silence so any matched alerts will not be suppressed.

1. Log in to the Dashboard.

2. On the navigation bar, click Cluster.

3. Select Alerts from the drop-down menu.
4. Click the Silences tab.
5. Click on the row for the alert, click the *Edit* drop-down menu, and then click *Expire*.

6. In the *Expire Silence* dialog, select *Yes, I am sure*, and then click the *Expire Silence* button.

   ![Expire Silence dialog](image)

   **Are you sure that you want to expire the selected Silence?**

   - Yes, I am sure.

7. A notification towards the top right corner of the page pops up indicating that the silence was expired successfully.

   ![Expired Silence notification](image)

5.7.6. Additional Resources

- For more information, see the *Troubleshooting Guide*.

5.8. MANAGING POOLS

As a storage administrator, you can create pools.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed

5.8.1. Creating pools
You can create pools to logically partition your storage objects.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.

**Procedure**

1. Log in to the dashboard.

2. On the navigation bar, click *Pools*.

3. Click the *Create* button towards the top left corner of the page.

4. In the dialog window, set the name.
5. Select either replicated or Erasure Coded (EC) pool type.

6. Set the Placement Group (PG) number.
For assistance in choosing the PG number, use the PG calculator. Contact Red Hat Technical Support if unsure.

7. Optional: If using a replicated pool type, set the replicated size.
8. Optional: If using an EC pool type configure the following additional settings.
   a. Optional: To see the settings for the currently selected EC profile, click the question mark.

   i. A table of the settings for the selected EC profile is shown.

<table>
<thead>
<tr>
<th>Erasure code profile</th>
<th>default</th>
</tr>
</thead>
<tbody>
<tr>
<td>k</td>
<td>2</td>
</tr>
<tr>
<td>m</td>
<td>1</td>
</tr>
<tr>
<td>name</td>
<td>default</td>
</tr>
<tr>
<td>plugin</td>
<td>jeraser</td>
</tr>
<tr>
<td>technique</td>
<td>reed_sol_van</td>
</tr>
</tbody>
</table>
b. Optional: Add a new EC profile by clicking the plus symbol.

i. Set the name of the new EC profile, at 1, click any question mark symbol for info about that setting, at 2, and after modifying all required settings, click Create EC Profile, at 3.

ii. Select the new EC profile.
c. Optional: If EC overwrites are required, click its button.

9. Optional: Click the pencil symbol to select an application for the pool.

10. Optional: If compression is required, select passive, aggressive, or force.

11. Click the Create Pool button.

12. Notifications towards the top right corner of the page indicate the pool was created successfully.
Additional Resources

- For more information, see Ceph pools in the Architecture Guide.
CHAPTER 6. OBJECT GATEWAY

As a storage administrator, the object gateway functions of the dashboard allow you to manage and monitor the Ceph Object Gateway.

For example, monitoring functions allow you to view details about a gateway daemon such as its zone name, or performance graphs of GET and PUT rates. Management functions allow you to view, create, and edit both users and buckets.

Object gateway functions are divided between daemon functions, user functions, and bucket functions.

6.1. PREREQUISITES

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- Ceph Object Gateway is installed.

6.2. OBJECT GATEWAY DAEMON FUNCTIONS

As a storage administrator, the Red Hat Ceph Storage Dashboard allows you to view and monitor information about Ceph Object Gateway daemons.

6.2.1. Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph Object Gateway is installed.
- Object gateway login credentials are added to the dashboard.

6.2.2. Viewing object gateway daemons

The dashboard allows you to view a list of all Ceph Object Gateway daemons.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph Object Gateway is installed.
- Object gateway login credentials are added to the dashboard.

Procedure

1. Log in to the Dashboard.
2. On the navigation bar, click Object Gateway.
3. Click Daemons.

4. In the example below, you can see a daemon with the ID **jb-ceph4-rgw.rgw0** in the Daemons List.

5. To view details, select the daemon by clicking the row for **jb-ceph4-rgw.rgw0**.
You can see the zone name the daemon is serving is **default**.

**Additional Resources**

- For information on how to install the Ceph Object Gateway, see [Installing the Ceph Object Gateway](#) in the Installation Guide.
6.3. OBJECT GATEWAY USER FUNCTIONS

As a storage administrator, the Red Hat Ceph Storage Dashboard allows you to view and manage Ceph Object Gateway users.

6.3.1. Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph Object Gateway is installed.
- Object gateway login credentials are added to the dashboard.

6.3.2. Viewing object gateway users

The dashboard allows you to view a list of all Ceph Object Gateway users.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph Object Gateway is installed.
- Object gateway login credentials are added to the dashboard.

**Procedure**

1. Log in to the Dashboard.
2. On the navigation bar, click Object Gateway.
3. Click Users.
4. In the example below, you can see a user named `rgw-user` in the table.

5. To view details, select the user by clicking the row for `rgw-user`.
Additional Resources

- For information on how to install the Ceph Object Gateway, see Installing the Ceph Object Gateway in the Installation Guide.

- For information on how to add object gateway login credentials to the dashboard, see Adding object gateway login credentials to the dashboard in the Dashboard guide.

- For more information on the Ceph Object Gateway, see the Object Gateway Configuration and Administration Guide.

6.3.3. Creating object gateway users

The dashboard allows you to create Ceph Object Gateway users.

Prerequisites

- A running Red Hat Ceph Storage cluster.
• Dashboard is installed.
• The Ceph Object Gateway is installed.
• Object gateway login credentials are added to the dashboard.

Procedure

1. Log in to the Dashboard.

2. On the navigation bar, click Object Gateway.

3. Click Users.

4. Click Create.

5. Set the user name, full name, and edit the maximum number of buckets if required.
6. Optional: Set an email address or suspended status.
7. Optional: Set a custom access key and secret key by unchecking *Auto-generate key*.

   a. Uncheck *Auto-generate key*:

   ![Uncheck Auto-generate key](image)

   b. Set the access key and secret key:
8. Optional: Set a user quota.

a. Check Enabled under User quota:

b. Uncheck Unlimited size or Unlimited objects:

c. Enter the required values for Max. size or Max. objects:

a. Check *Enabled* under *Bucket quota:*

b. Uncheck *Unlimited size* or *Unlimited objects:*

c. Enter the required values for *Max. size* or *Max. objects:*
10. Finalize the user creation by clicking Create User.

11. Verify the user creation was successful. A notification confirms the user was created and the user can be seen in the table of users.

Additional Resources

- For information on how to install the Ceph Object Gateway, see Installing the Ceph Object Gateway in the Installation Guide.

- For information on how to add object gateway login credentials to the dashboard, see Adding object gateway login credentials to the dashboard in the Dashboard guide.

- For more information on the Ceph Object Gateway, see the Object Gateway Configuration and Administration Guide.

6.4. OBJECT GATEWAY BUCKET FUNCTIONS

As a storage administrator, the Red Hat Ceph Storage Dashboard allows you to view and manage Ceph Object Gateway buckets.
6.4.1. Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph Object Gateway is installed.
- Object gateway login credentials are added to the dashboard.

6.4.2. Viewing object gateway buckets

The dashboard allows you to view and manage Ceph Object Gateway buckets.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph Object Gateway is installed.
- Object gateway login credentials are added to the dashboard.
- An object gateway bucket is created.

Procedure

1. Log in to the Dashboard.
2. On the navigation bar, click Object Gateway.
3. Click Buckets.
4. In the example below, you can see a bucket named `my-bucket` in the table.

5. To view details, select the bucket by clicking the row for `my-bucket`. 
6.4.3. Creating object gateway buckets

The dashboard allows you to create Ceph Object Gateway buckets.

Additional Resources

- For information on how to install the Ceph Object Gateway, see Installing the Ceph Object Gateway in the Installation Guide.
- For information on how to add object gateway login credentials to the dashboard, see Adding object gateway login credentials to the dashboard in the Dashboard guide.
- For more information on the Ceph Object Gateway, see the Object Gateway Configuration and Administration Guide.
Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph Object Gateway is installed.
- Object gateway login credentials are added to the dashboard.
- An object gateway user that is not suspended is created.

Procedure

1. Log in to the Dashboard.

2. On the navigation bar, click Object Gateway.

3. Click Buckets.

4. Click Create.
5. Enter a value for Name and select a user that is not suspended.

6. Click Create bucket.
7. Verify the bucket creation was successful. A notification confirms the bucket was created and the bucket can be seen in the table of buckets.

Additional Resources

- For information on how to install the Ceph Object Gateway, see Installing the Ceph Object Gateway in the Installation Guide.
- For information on how to add object gateway login credentials to the dashboard, see Adding object gateway login credentials to the dashboard in the Dashboard guide.
- For more information on the Ceph Object Gateway, see the Object Gateway Configuration and Administration Guide.

6.5. MANUALLY ADDING OBJECT GATEWAY LOGIN CREDENTIALS TO THE DASHBOARD

The Red Hat Ceph Storage Dashboard can manage the Ceph Object Gateway, also known as the RADOS Gateway, or RGW. To manage the Ceph Object Gateway, the dashboard must connect to it using login credentials of an RGW user with the system flag. When the Object Gateway is installed using ceph-ansible, it automatically adds the login credentials to the dashboard. It is also possible to set the login credentials manually.

Prerequisites
- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- Ceph Object Gateway is installed.

**Procedure**

1. Obtain the **access_key** and **secret_key** of an RGW user with the **system** flag enabled:
   - If you do not have an RGW user with the **system** flag enabled, create one.

   ```bash
   radosgw-admin user create --uid=USER_ID --display-name=DISPLAY_NAME --system
   ```

   Example:

   ```bash
   [root@mon ~]# radosgw-admin user create --uid=rgw-user --display-name=RGW-user --system
   {  
      "user_id": "rgw-user",
      "display_name": "RGW-user",
      "email": "",
      "suspended": 0,
      "max_buckets": 1000,
      "subusers": [],
      "keys": [  
        {  
          "user": "rgw-user",
          "access_key": "BYC5SWQQH24A2BFHS2RC",
          "secret_key": "159d94uHK9ADiWZrGsNYWYjRXCDrhL2xVi8PO6kT"
        }
      ],
      "swift_keys": [],
      "caps": [],
      "op_mask": "read, write, delete",
      "system": "true",
      "default_placement": "",
      "default_storage_class": "",
      "placement_tags": [],
      "bucket_quota": {  
        "enabled": false,
        "check_on_raw": false,
        "max_size": -1,
        "max_size_kb": 0,
        "max_objects": -1
      },
      "user_quota": {  
        "enabled": false,
        "check_on_raw": false,
        "max_size": -1,
        "max_size_kb": 0,
        "max_objects": -1
      },
      "temp_url_keys": []
   }
   ```
Take note of the values for `access_key` and `secret_key`. In the example above, `access_key` is `BYC5SWQQH24A2BFHS2RC` and `secret_key` is `159d94uHK9ADiWZrGsNYWYjRXCDrhL2xVi8PO6kT`.

- If an RGW user with the `system` flag enabled is already created, obtain the credentials using the `user info` command of the `radosgw-admin` utility.

```bash
radosgw-admin user info --uid=USER_ID
```

Example:

```
[root@mon ~]# radosgw-admin user info --uid=rgw-user
{
   "user_id": "rgw-user",
   "display_name": "RGW-user",
   "email": "",
   "suspended": 0,
   "max_buckets": 1000,
   "subusers": [],
   "keys": [
      {
         "user": "rgw-user",
         "access_key": "BYC5SWQQH24A2BFHS2RC",
         "secret_key": "159d94uHK9ADiWZrGsNYWYjRXCDrhL2xVi8PO6kT"
      }
   ],
   "swift_keys": [],
   "caps": [],
   "op_mask": "read, write, delete",
   "system": "true",
   "default_placement": "",
   "default_storage_class": "",
   "placement_tags": [],
   "bucket_quota": {
      "enabled": false,
      "check_on_raw": false,
      "max_size": -1,
      "max_size_kb": 0,
      "max_objects": -1
   },
   "user_quota": {
      "enabled": false,
      "check_on_raw": false,
      "max_size": -1,
      "max_size_kb": 0,
      "max_objects": -1
   },
   "temp_url_keys": [],
   "type": "rgw",
   "mfa_ids": []
}
```
Take note of the values for **access_key** and **secret_key**. In the example above, **access_key** is `BYC5SWQQH24A2BFHS2RC` and **secret_key** is `159d94uHK9ADiWZrGsNYWYjRXCDrhL2xVi8PO6kT`.

2. Provide the **access_key** and **secret_key** credentials to the dashboard:

   a. Provide the **access_key** to the dashboard.

      ```
      ceph dashboard set-rgw-api-access-key ACCESS_KEY
      ```

      Example:

      ```
      [root@mon ~]# ceph dashboard set-rgw-api-access-key BYC5SWQQH24A2BFHS2RC
      Option RGW_API_ACCESS_KEY updated
      ```

   b. Provide the **secret_key** to the dashboard.

      ```
      ceph dashboard set-rgw-api-secret-key SECRET_KEY
      ```

      Example:

      ```
      [root@mon ~]# ceph dashboard set-rgw-api-secret-key 159d94uHK9ADiWZrGsNYWYjRXCDrhL2xVi8PO6kT
      Option RGW_API_SECRET_KEY updated
      ```

3. Provide the host name and port of the object gateway to the dashboard:

   a. Provide the host name to the dashboard.

      ```
      ceph dashboard set-rgw-api-host HOST_NAME
      ```

      Example:

      ```
      [root@mon ~]# ceph dashboard set-rgw-api-host 192.168.122.193
      Option RGW_API_HOST updated
      ```

   b. Provide the port to the dashboard.

      ```
      ceph dashboard set-rgw-api-port PORT
      ```

      Example:

      ```
      [root@mon ~]# ceph dashboard set-rgw-api-port 8080
      Option RGW_API_PORT updated
      ```

4. Optional: If you are using HTTPS with a self-signed certificate, disable certificate verification in the dashboard to avoid refused connections. Refused connections can happen when the certificate is signed by an unknown Certificate Authority, or if the host name used does not match the host name in the certificate.

   ```
   ceph dashboard set-rgw-api-ssl-verify false
   ```

   Example:
[root@mon ~]# ceph dashboard set-rgw-api-ssl-verify false
Option RGW_API_SSL_VERIFY updated

Additional Resources

- For information on how to install the Ceph Object Gateway, see Installing the Ceph Object Gateway in the Installation Guide.

- For more information on the Ceph Object Gateway, see the Object Gateway Configuration and Administration Guide.
CHAPTER 7. BLOCK DEVICES

7.1. BLOCK DEVICES INTRODUCTION

The block device functions of the dashboard allow you to manage and monitor block device images. The functionality is divided between generic image functions, mirroring functions, iSCSI functions, and Quality of Service configuration. For example, you can create new images, view the state of images mirrored across clusters, manage or monitor iSCSI targets, and set IOPS limits on an image.

7.2. IMAGES FUNCTIONS

The dashboard provides several functions related to managing and monitoring images.

7.2.1. Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.

7.2.2. Viewing images

The dashboard allows you to view images.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- An image is in the cluster.

Procedure

1. Log in to the Dashboard.
2. On the navigation bar, click Block.
3. Click Images:
In the above example, you can see a 10 GiB image named *disk_1*.

4. To view details, select the image by clicking the row for *disk_1*.
7.3. MIRRORING FUNCTIONS
The dashboard allows you to manage and monitor mirroring functions.

7.3.1. Prerequisites
- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.

7.3.2. Mirroring view
The dashboard allows you to view the overall state of mirroring functions.

Prerequisites
- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- Mirroring is configured.

Procedure
1. Log in to the Dashboard.
2. On the navigation bar, click Block.
3. Click Mirroring:

In the above example, you can see mirroring information categorized into tables labeled Daemons, Pools, and Images.

Additional Resources
7.4. ISCSI FUNCTIONS

The dashboard allows you to manage and monitor iSCSI images and targets. Before you can use the dashboard to manage and monitor iSCSI images and targets, you must add gateways to it and enable the dashboard iSCSI feature.

7.4.1. Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- iSCSI gateways are added to the dashboard.

7.4.2. Manually adding iSCSI gateways to the dashboard

The Red Hat Ceph Storage Dashboard can manage iSCSI targets using the REST API provided by the rbd-target-api service of the Ceph iSCSI Gateway. You must add the API address to the dashboard before the dashboard can access it.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph iSCSI Gateway is installed.

**IMPORTANT**

The Ceph iSCSI gateway requires at least two gateways to provide high availability.

Procedure

1. Log in to a Monitor node.

2. Optional: If the REST API for the iSCSI gateway is configured in HTTPS mode using a self-signed certificate, you must configure the dashboard to avoid SSL certificate verification when accessing the API. Run the following command to disable SSL verification.

   ```bash
   # ceph dashboard set-iscsi-api-ssl-verification false
   
   Example:
   
   [root@mon ~]# ceph dashboard set-iscsi-api-ssl-verification false
   Option ISCSI_API_SSL_VERIFICATION updated
   ``

3. Add the first of at least two gateways to the dashboard:

   ```bash
   # ceph dashboard iscsi-gateway-add SCHEME://USERNAME:PASSWORD@HOST[:PORT]
   ```
Example:

[root@mon ~]# ceph dashboard iscsi-gateway-add
http://admin:admin@192.168.122.157:5000
Success

NOTE

The **USERNAME** and **PASSWORD** were set when you configured the iSCSI target.
The credentials can be retrieved from the `iscsi-gateway.cfg` file on the iSCSI Gateway node.

4. Add the second of at least two gateways to the dashboard:

```
# ceph dashboard iscsi-gateway-add SCHEME://USERNAME:PASSWORD@HOST[:PORT]
```

Example:

[root@mon ~]# ceph dashboard iscsi-gateway-add
http://admin:admin@192.168.122.193:5000
Success

NOTE

The **USERNAME** and **PASSWORD** were set when you configured the iSCSI target.
The credentials can be retrieved from the `iscsi-gateway.cfg` file on the iSCSI Gateway node.

5. Verify the gateways were added correctly:

```
# ceph dashboard iscsi-gateway-list
```

Example:

[root@mon ~]# ceph dashboard iscsi-gateway-list
{"gateways": {"jb-ceph4-rgw": {"service_url": "http://admin:admin@192.168.122.193:5000"},
  "jb-ceph4-osd1": {"service_url": "http://admin:admin@192.168.122.157:5000"}}}

6. Optional: If you make a mistake adding a gateway you can remove it by specifying its hostname as mentioned in the command `iscsi-gateway-list`:

```
# ceph dashboard iscsi-gateway-rm GATEWAY_NAME
```

Example:

[root@mon ~]# ceph dashboard iscsi-gateway-rm jb-ceph4-rgw
Success

Additional Resources
7.4.3. iSCSI overview

The dashboard provides an overview that displays iSCSI gateway hosts and images exported over iSCSI.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph iSCSI gateway is installed.
- iSCSI gateways are added to the dashboard.
- The dashboard iSCSI feature is enabled.

Procedure

1. Log in to the Dashboard.
2. On the navigation bar, click Block.
3. Click iSCSI:

![Dashboard Screenshot]

**Gateways**

<table>
<thead>
<tr>
<th>Name</th>
<th>State</th>
<th># Targets</th>
<th># Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>b-ceph4-osd1</td>
<td>up</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>b-ceph6-rgw</td>
<td>up</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

2 total

**Images**

<table>
<thead>
<tr>
<th>Pool</th>
<th>Image</th>
<th>Backstore</th>
<th>Read Bytes</th>
<th>Write Bytes</th>
<th>Read Ops</th>
<th>Write Ops</th>
<th>A/O Since</th>
</tr>
</thead>
</table>

0 total

Additional Resources

For information on how to install the Ceph iSCSI Gateway, see Installing the iSCSI gateway in the Block Device Guide.
7.4.4. Creating iSCSI targets

The dashboard allows you to create iSCSI targets.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph iSCSI gateway is installed with at least two gateways.
- iSCSI gateways are added to the dashboard.
- The dashboard iSCSI feature is enabled.
- A replicated pool with the RBD application enabled.
- An erasure coded pool with the RBD application enabled.

Procedure

1. Log in to the Dashboard.
2. On the navigation bar, click Block.
3. Click iSCSI:
4. Towards the upper left corner of the page, click the Targets tab:

5. Towards the upper left corner of the page, click the Add button:
6. Optional: Modify the Target IQN.

7. Optional: Set advanced settings for the target.
   a. Click the gear to set advanced settings for the target.
b. Set advanced settings in the *Advanced Settings* dialog window.

c. Click *Confirm* to save the settings.

8. Click the *Add portal* button and select the first of at least two gateways:
9. Click the *Add portal* button and select the second of at least two gateways:

Repeat this step for any additional gateways.

10. Click the *Add image* button and select an image to be exported by the target:

Repeat this step for any additional images.

11. Optional: Modify the Images.

   a. Click the gear to the right of the image
b. Modify image settings in the Configure dialog window:

```
<table>
<thead>
<tr>
<th>Target IQN</th>
<th>iqn.2001-07.com.ceph:5731d6877693</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portals</td>
<td>jb-ceph4-osd:192.168.122.157</td>
</tr>
<tr>
<td></td>
<td>jb-ceph4-rgw:192.168.122.193</td>
</tr>
<tr>
<td>Images</td>
<td>rbd/disk_1</td>
</tr>
<tr>
<td>ACL authentication</td>
<td>No items added.</td>
</tr>
<tr>
<td>Initiators</td>
<td>No items added.</td>
</tr>
<tr>
<td>Groups</td>
<td>No items added.</td>
</tr>
</tbody>
</table>
```

![Configure dialog window](image)

![Edit Target dialog window](image)

12. Click the **ACL authentication** box and then click the **Add initiator** button:

c. Click **Confirm** to save the settings.
13. Enter the IQN from your client in the first text box:
Retrieve the client IQN from the system where the initiator software runs. See Configuring the iSCSI initiator in the Block Device Guide for more information.

14. Enter a user name and password details for the target:
15. Click Add image and select an image:
Repeat this step for any additional images.

16. Finish the procedure by clicking the Create Target button:
17. Verify the target was added by looking for it on the Targets page.
   To locate the Targets page, follow the procedure Viewing iSCSI targets in the Dashboard guide.

Additional Resources

- For information on how to install the Ceph iSCSI Gateway, see Installing the iSCSI gateway in the Block Device Guide.
- For information on how to add iSCSI gateways to the dashboard, see Manually adding iSCSI gateways to the dashboard in the Dashboard Guide.
- For information on how to enable the dashboard iSCSI feature see Enabling the dashboard iSCSI feature in the dashboard in the Dashboard Guide.
- For information on how to create a pool with the RBD application enabled, see Creating Block Device Pools in the Block Device Guide.
- For information on how to create images see Creating block device images in the Block Device Guide.

7.4.5. Viewing iSCSI targets

The dashboard allows you to view iSCSI targets.

Prerequisites

- A running Red Hat Ceph Storage cluster.
1. Dashboard is installed.

2. The Ceph iSCSI gateway is installed.

3. An iSCSI target is created.

**Procedure**

1. Log in to the Dashboard.

2. On the navigation bar, click **Block** and then click **iSCSI**:

3. Towards the upper left corner of the page, click the **Targets** tab:

4. To view details about a target, click on its row:
5. You can see the iSCSI topology, including whether an initiator is logged in:

6. Click an object to view detailed information about it:
Note: Only some objects display detailed information when clicked.

Additional Resources

- For information on how to install the Ceph iSCSI gateway, see Installing the iSCSI gateway in the Block Device Guide.

- For information on how to create iSCSI targets in dashboard, see Creating iSCSI targets in the Dashboard guide.

7.4.6. Editing iSCSI targets

The dashboard allows you to edit iSCSI targets.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph iSCSI gateway is installed with at least two gateways.
- iSCSI gateways are added to the dashboard.
- The dashboard iSCSI feature is enabled.
- A replicated pool with the RBD application enabled.
- An erasure coded pool with the RBD application enabled.
- An iSCSI target is created.
Procedure

1. Log in to the Dashboard.

2. On the navigation bar, click Block.

3. Click iSCSI:

4. Towards the upper left corner of the page, click the Targets tab:
5. To edit a target, click on its row:

6. Towards the upper left corner of the page, click the *Edit* button.
Edit the parameters and click the *Edit Target* button.
8. Verify the target was edited by looking for it on the Targets page.
To locate the Targets page, follow the procedure Viewing iSCSI targets in the Dashboard guide.

Additional Resources

- For information on how to install the Ceph iSCSI Gateway, see Installing the iSCSI gateway in the Block Device Guide.

- For information on how to add iSCSI gateways to the dashboard, see Manually adding iSCSI gateways to the dashboard in the Dashboard Guide.

- For information on how to enable the dashboard iSCSI feature see Enabling the dashboard iSCSI feature in the dashboard in the Dashboard Guide.

- For information on how to create a pool with the RBD application enabled, see Creating Block Device Pools in the Block Device Guide

- For information on how to create images see Creating block device images in the Block Device Guide.

7.4.7. Deleting iSCSI targets

The dashboard allows you to delete iSCSI targets.

Prerequisites

- A running Red Hat Ceph Storage cluster.

- Dashboard is installed.
- The Ceph iSCSI gateway is installed with at least two gateways.
- iSCSI gateways are added to the dashboard.
- The dashboard iSCSI feature is enabled.
- An iSCSI target is created.
- Disconnect all iSCSI Initiators. See Disconnecting iSCSI initiators.

**Procedure**

1. Log in to the Dashboard.
2. On the navigation bar, click *Block*.
3. Click *iSCSI*:

![Dashboard with iSCSI tab selected]

   - **Gateways**:
     - Name: j-b-ceph4-osd1, State: up, # Targets: 0, # Sessions: 0
     - Name: j-b-ceph4-rgw, State: up, # Targets: 0, # Sessions: 0 (2 total)

   - **Images**:
     - No data to display (0 total)

4. Towards the upper left corner of the page, click the *Targets* tab:
5. To delete a target, click on its row:

6. Towards the upper left corner of the page, click the Edit drop down.

7. From the drop-down, select Delete:
8. Click the Yes, I am sure box and then Click Delete iSCSI to save the settings.

Additional Resources

- For information on how to install the Ceph iSCSI Gateway, see Installing the iSCSI gateway in the Block Device Guide.
- For information on how to add iSCSI gateways to the dashboard, see Manually adding iSCSI gateways to the dashboard in the Dashboard Guide.
- For information on how to disconnect iSCSI initiators see Disconnecting iSCSI initiators in the Block Device Guide.

7.4.8. Setting Discovery Authentication

The dashboard allows Discovery Authentication by using CHAP/CHAP_MUTUAL.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- The Ceph iSCSI gateway is installed with at least two gateways.
• iSCSI gateways are added to the dashboard.
• The dashboard iSCSI feature is enabled.
• A replicated pool with the RBD application enabled.
• An erasure coded pool with the RBD application enabled.

Procedure

1. Log in to the Dashboard.
2. On the navigation bar, click Block.
3. Click iSCSI:

   ![iSCSI Gateway Dashboard]

   **Gateways**

<table>
<thead>
<tr>
<th>Name</th>
<th>State</th>
<th># Targets</th>
<th># Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>b-ceph4-osd1</td>
<td>up</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>b-ceph4-raw</td>
<td>up</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
   
   **Images**

   ![Images]

   0 total

4. Towards the upper left corner of the page, click the Targets tab.
5. Towards the upper left corner of the page, click the *Discovery authentication* button.

6. In *Discovery Authentication* window, provide the details and then Click the *Submit* button.

7.5. QUALITY OF SERVICE CONFIGURATION

As a storage administrator, you can use Quality of Service (QoS) limits to prioritize or deprioritize the performance of pools or images so all images get the resources they need to meet specific business needs.
7.5.1. Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.

7.5.2. Configuring Quality of Service on an existing image

As a storage administrator, you can use Quality of Service (QoS) limits to prioritize or deprioritize the performance of an existing image.

Prerequisites

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- A replicated pool with the RBD application enabled.
- An erasure coded pool with the RBD application enabled.
- An existing image.

Procedure

1. Log in to the dashboard.

2. On the navigation bar, click Block and then click Images:

3. Click the row of an image to select it for editing:
4. Click the **Edit** button:

5. Click **Advanced** towards the bottom right corner of the dialog:
6. Click the plus symbol next to Quality of Service to open the QoS settings:

```
Advanced

Striping

Object size  | 4 MiB
Strip unit   | 4 MiB
Strip count  | 1
```

7. Optional: Click the question mark symbol next to an individual setting to find out more about it.
8. Enter or edit values for the QoS settings you want to change:
9. Optional: Click the eraser symbol for any setting to remove the local value and inherit the value from the parent pool or global configuration.
The field for the setting is disabled to indicate it is inheriting the value from the parent.
7.5.3. Configuring Quality of Service on an existing pool

As a storage administrator, you can configure Quality of Service (QoS) on an existing pool.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- A replicated pool with the RBD application enabled.
- An erasure coded pool with the RBD application enabled.

**Procedure**

1. Log in to the dashboard.
2. On the navigation bar, click Pools.

3. Click the row of a replicated pool with the RBD application to select it for editing:

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Application</th>
<th>PG Status</th>
<th>Replicas</th>
<th>Last Chance</th>
<th>Erasure-Coded</th>
<th>Crush Ruleset</th>
</tr>
</thead>
<tbody>
<tr>
<td>.rgw.root</td>
<td>replicated</td>
<td>rgw</td>
<td>8 active+clean</td>
<td>3</td>
<td>14</td>
<td></td>
<td>replicated_rule</td>
</tr>
<tr>
<td>default.rgw.control</td>
<td>replicated</td>
<td>rgw</td>
<td>8 active+clean</td>
<td>3</td>
<td>16</td>
<td></td>
<td>replicated_rule</td>
</tr>
<tr>
<td>default.rgw.log</td>
<td>replicated</td>
<td>rgw</td>
<td>8 active+clean</td>
<td>3</td>
<td>20</td>
<td></td>
<td>replicated_rule</td>
</tr>
<tr>
<td>default.rgw.meta</td>
<td>replicated</td>
<td>rgw</td>
<td>8 active+clean</td>
<td>3</td>
<td>18</td>
<td></td>
<td>replicated_rule</td>
</tr>
<tr>
<td>pool1</td>
<td>erasure</td>
<td>rbd</td>
<td>8 active+clean</td>
<td>3</td>
<td>67</td>
<td>default</td>
<td>erasure-code</td>
</tr>
<tr>
<td>pool2</td>
<td>replicated</td>
<td>rbd</td>
<td>8 active+clean</td>
<td>3</td>
<td>85</td>
<td></td>
<td>replicated_rule</td>
</tr>
</tbody>
</table>

0 selected / 6 total

4. Click the Edit button:
5. Click the plus symbol next to Quality of Service to open the QoS settings:

6. Optional: Click the question mark symbol next to an individual setting to find out more about it.
7. Enter or edit values for the QoS settings you want to change:
8. Optional: Click the eraser symbol for any setting to remove the local value and inherit the value from the parent global configuration.
The field for the setting is disabled to indicate it is inheriting the value from the parent.
7.5.4. Configuring Quality of Service when creating an image

As a storage administrator, you can configure Quality of Service (QoS) limits when creating an image.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- A replicated pool with the RBD application enabled.
- An erasure coded pool with the RBD application enabled.

**Procedure**

1. Log in to the dashboard.
2. On the navigation bar, click Block and then click Images:

![Image showing the navigation bar and the 'Images' option highlighted.]

3. Click the Create button:

![Image showing the 'Create' button highlighted.]

4. At 1, set the name, at 2, set the pool, at 3, set the size, and at 4, click Advanced.
5. Click the plus symbol next to *Quality of Service* to open the QoS settings:

### Advanced

#### Stripping

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object size</td>
<td>4 MiB</td>
</tr>
<tr>
<td>Stripe unit</td>
<td>-- Select stripe unit --</td>
</tr>
<tr>
<td>Stripe count</td>
<td>3</td>
</tr>
</tbody>
</table>

### RBD Configuration

- **Quality of Service**

6. Optional: Click the question mark symbol next to an individual setting to find out more about it.
7. Enter or edit values for the QoS settings you want to change:
Quality of Service

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPS Limit</td>
<td>2 GB/s</td>
</tr>
<tr>
<td>IOPS Limit</td>
<td>500 IOPS</td>
</tr>
<tr>
<td>Read BPS Limit</td>
<td>1 GB/s</td>
</tr>
<tr>
<td>Read IOPS Limit</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>Write BPS Limit</td>
<td>500 MB/s</td>
</tr>
<tr>
<td>Write IOPS Limit</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>BPS Burst</td>
<td>0 B/s</td>
</tr>
<tr>
<td>IOPS Burst</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>Read BPS Burst</td>
<td>0 B/s</td>
</tr>
<tr>
<td>Read IOPS Burst</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>Write BPS Burst</td>
<td>0 B/s</td>
</tr>
<tr>
<td>Write IOPS Burst</td>
<td>0 IOPS</td>
</tr>
</tbody>
</table>

8. Optional: Click the eraser symbol for any setting to remove the local value and inherit the value from the parent pool configuration.
The field for the setting is disabled to indicate it is inheriting the value from the parent.

<table>
<thead>
<tr>
<th>Quality of Service</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BPS Limit</td>
<td>2 GB/s</td>
</tr>
<tr>
<td>IOPS Limit</td>
<td>500 IOPS</td>
</tr>
<tr>
<td>Read BPS Limit</td>
<td>1 GB/s</td>
</tr>
<tr>
<td>Read IOPS Limit</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>Write BPS Limit</td>
<td>500 MB/s</td>
</tr>
<tr>
<td>Write IOPS Limit</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>BPS Burst</td>
<td>0 B/s</td>
</tr>
<tr>
<td>IOPS Burst</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>Read BPS Burst</td>
<td>0 B/s</td>
</tr>
<tr>
<td>Read IOPS Burst</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>Write BPS Burst</td>
<td>0 B/s</td>
</tr>
<tr>
<td>Write IOPS Burst</td>
<td>0 IOPS</td>
</tr>
</tbody>
</table>
7.5.5. Configuring Quality of Service when creating a pool

As a storage administrator, you can configure Quality of Service (QoS) when creating a pool.

**Prerequisites**

- A running Red Hat Ceph Storage cluster.
- Dashboard is installed.
- A replicated pool with the RBD application enabled.
- An erasure coded pool with the RBD application enabled.

**Procedure**

1. Log in to the dashboard.
2. On the navigation bar, click Pools.

3. Click the Create button towards the top left corner of the page:

4. In the dialog box, at 1, set the pool name, at 2, set the pool type to erasure, at 3, set the number of placement groups, at 4, enable EC Overwrites, at 5, set the rbd application, finally, at 6, click Create Pool.
5. Create another pool but this time set its type to \textit{replicated}:

6. Click the plus symbol next to \textit{Quality of Service} to open the QoS settings:
7. Optional: Click the question mark symbol next to an individual setting to find out more about it.
8. Enter or edit values for the QoS settings you want to change:
9. Optional: Click the eraser symbol for any setting to remove the local value and inherit the value from the parent global configuration.
### Quality of Service

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPS Limit</td>
<td>2 GB/s</td>
</tr>
<tr>
<td>IOPS Limit</td>
<td>500 IOPS</td>
</tr>
<tr>
<td>Read BPS Limit</td>
<td>1 GB/s</td>
</tr>
<tr>
<td>Read IOPS Limit</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>Write BPS Limit</td>
<td>500 MB/s</td>
</tr>
<tr>
<td>Write IOPS Limit</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>BPS Burst</td>
<td>0 B/s</td>
</tr>
<tr>
<td>IOPS Burst</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>Read BPS Burst</td>
<td>0 B/s</td>
</tr>
<tr>
<td>Read IOPS Burst</td>
<td>0 IOPS</td>
</tr>
<tr>
<td>Write BPS Burst</td>
<td>0 B/s</td>
</tr>
<tr>
<td>Write IOPS Burst</td>
<td>0 IOPS</td>
</tr>
</tbody>
</table>

The field for the setting is disabled to indicate it is inheriting the value from the parent.
10. Click the Create Pool button:

**Quality of Service**

- **BPS Limit**: 2 GB/s
- **IOPS Limit**: 500 IOPS
- **Read BPS Limit**: 1 GB/s
- **Read IOPS Limit**: 0 IOPS
- **Write BPS Limit**: 0 B/s
- **Write IOPS Limit**: 0 IOPS
- **BPS Burst**: 0 B/s
- **IOPS Burst**: 0 IOPS
- **Read BPS Burst**: 0 B/s
- **Read IOPS Burst**: 0 IOPS
- **Write BPS Burst**: 0 B/s
- **Write IOPS Burst**: 0 IOPS

**7.5.6. Additional Resources**

- For more information on block devices, see the [Block Device guide](#).
APPENDIX A. TROUBLESHOOTING

This section provides the multiple troubleshooting scenarios while using the dashboard.

A.1. DASHBOARD RESPONSE IS SLOW
If the dashboard response is slow, clear the browser cache and reload the dashboard.

A.2. DASHBOARD SHOWS A SERVICE IS DOWN
Dashboard is only a replica of the cluster. If the service is down, check the service status on the node as dashboard displays information collected via node-exporter running on the node. The issue may be in the cluster, configuration, or network.

A.3. TASK FAILURE ON DASHBOARD
While performing any task on the dashboard, if there is any failure, check the respective Ceph daemons. For more information refer to the Troubleshooting Guide

A.4. IMAGES CANNOT BE VIEWED
An image can only be viewed under Block > Images if the pool it is in has the RBD application enabled on it.
### Pools

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Applications</th>
<th>PG Status</th>
<th>Repl Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>.rgw.root</td>
<td>replicated</td>
<td>rgw</td>
<td></td>
<td>8 active+clean</td>
</tr>
<tr>
<td>default.rgw.control</td>
<td>replicated</td>
<td>rgw</td>
<td></td>
<td>8 active+clean</td>
</tr>
<tr>
<td>default.rgw.log</td>
<td>replicated</td>
<td>rgw</td>
<td></td>
<td>8 active+clean</td>
</tr>
<tr>
<td>default.rgw.meta</td>
<td>replicated</td>
<td>rgw</td>
<td></td>
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</tr>
<tr>
<td>pool1</td>
<td>erasure</td>
<td>rbd</td>
<td></td>
<td>8 active+clean</td>
</tr>
<tr>
<td>pool2</td>
<td>replicated</td>
<td>rbd</td>
<td></td>
<td>8 active+clean</td>
</tr>
</tbody>
</table>

*0 selected / 6 total*
APPENDIX A. TROUBLESHOOTING

Block > Images

<table>
<thead>
<tr>
<th>Images</th>
<th>Trash</th>
<th>Overall Performance</th>
</tr>
</thead>
</table>

**Create**

<table>
<thead>
<tr>
<th>Name</th>
<th>Pool</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>image1</td>
<td>pool2</td>
<td></td>
</tr>
</tbody>
</table>

0 selected / 1 total

Additional resources

For more information, refer to the Troubleshooting Guide