

CLOUDBLOCKS

Storage

Version 1.2

Revision History

Version Number	Date	Description
1.0.0	07-Mar-2017	First release of the document
1.1.0	03-Apr-2017	Removed Data Service and Logs section. Updated screenshots.
1.2.0	25-Apr-2017	Minor changes to some sections.

About This Document

This document provides information regarding the functions and features of the CloudBlocks Storage Dashboard. CloudBlocks Storage is powered by Acaleph. The underlying technology of the Acaleph is Ceph, so throughout this document Ceph terminology and concepts will be discussed, such as storage, nodes, clusters, placement groups, and many more.

Target Audience

This document is intended for System Administrators who are in charge of managing and monitoring storage resources.

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Document Conventions

The following conventions appear throughout this manual:

Convention	Description	Example
Bold	Represent information that you need to select or enter in a field.	Click the Settings link.
	Represent words that are given definition.	Username – a unique identifier for your account
	Gives emphasis on notes.	Note: You can add multiple services.
Bold Red	Represent warnings.	Warning: The volume you are taking a snapshot of cannot be attached to an instance during the snapshot process.
<i>Italic</i>	Represent information referring to a page, window, field, or tab name.	From the <i>Settings</i> page the user can create a new keypair.
Consolas	Sample codes are represented using this font.	Run source <code>openrc.sh</code> to set the environment variables.

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Overview

Acaleph is the storage solution used in CloudBlocks. Its primary focus is to deliver unified storage platform for the digital enterprise. Built on revolutionary Ceph¹ technology, Acaleph aims to deliver the key components of reliable storage:

- **Unified** – Effectively unifies all storage hardware by making use of Ceph's Reliable Autonomic Distributed Object Store (RADOS) which enables Acaleph servers to provide object, block, and file system storage in a single unified storage cluster.
- **Scalable** – Intelligently replicate data as needed.
- **Efficient** – Storing data efficiently by strategically using SSD drives and store sequential pieces of data across several storage devices.

The Dashboard allows administrators to monitor cluster health, manage their storage settings, and administrate users and permissions. The Dashboard has powerful tools allowing organizations to manage their data cluster according to their specific needs.

The key features of the Dashboard will be covered in the next few chapters of this document, allowing users to understand the capability of this solution.

¹ <http://www.ceph.com/>

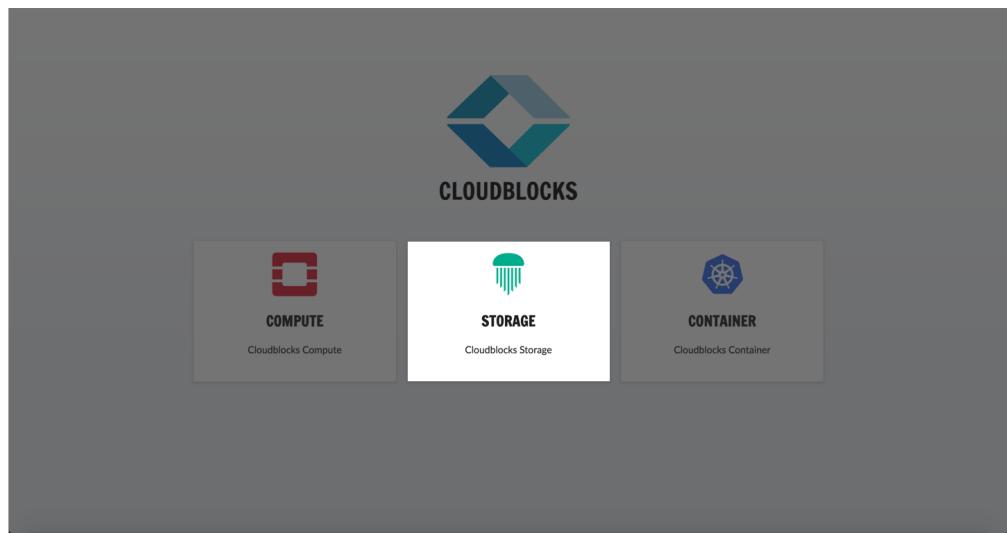
Accessing CloudBlocks Storage

Registered users can log in to the CloudBlocks Storage using the credentials provided by the admin. Once authentication is successful, users can start utilizing the different functions and features of the Dashboard.

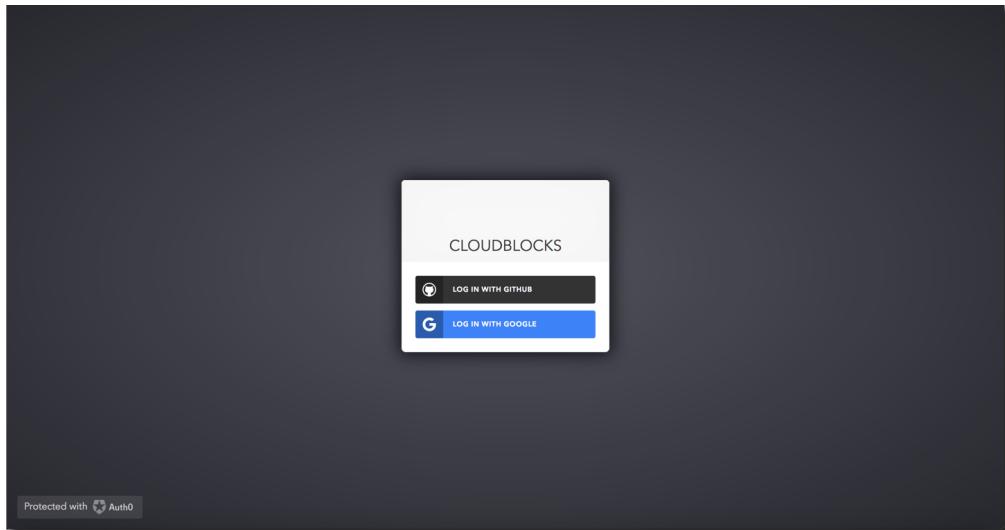
Logging In

To log in, perform the following steps.

1. From the *CloudBlocks* login page, select **Storage**.



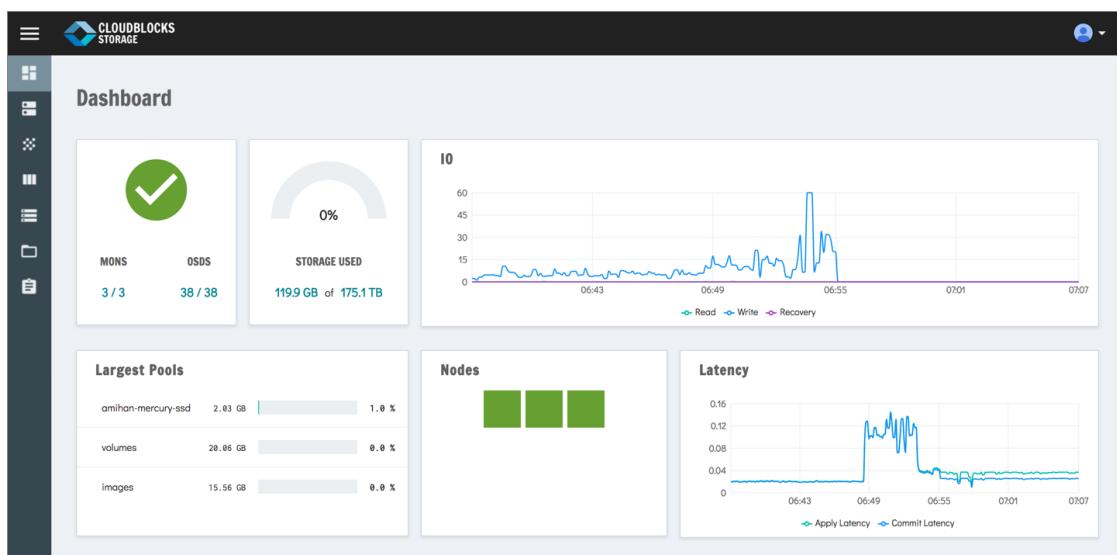
2. Select your login preference. You can either choose to log in using your **Github** account or **Google** account.



3. From the *Login* page, enter the **Email** in the field provided.
4. Enter your **Password** in the field provided.
5. Click **Sign in** to begin.

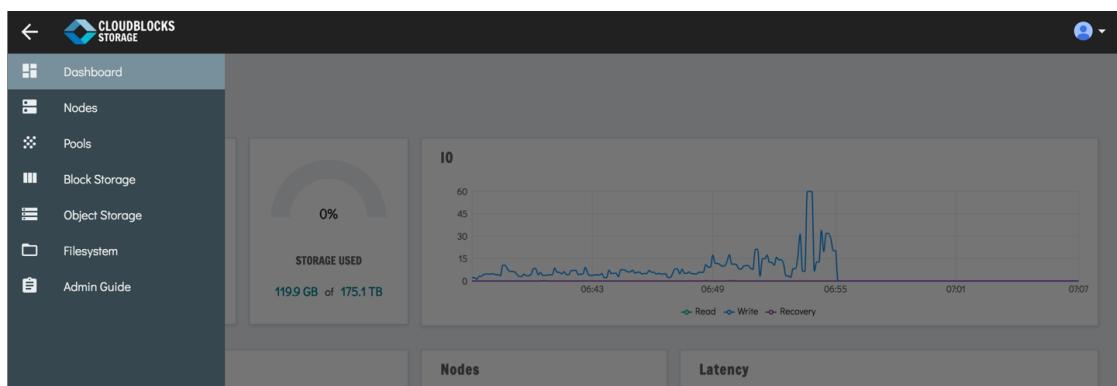
Dashboard

The first tab you will see in the CloudBlocks Storage is the **Dashboard**. It displays an overview of the Acaleph storage cluster by providing a visual representation of MONS, OSDs, and Node status, the amount of storage used, pools that uses the most data, and the input/output performance measurement. These features are explained in the next few sections below.



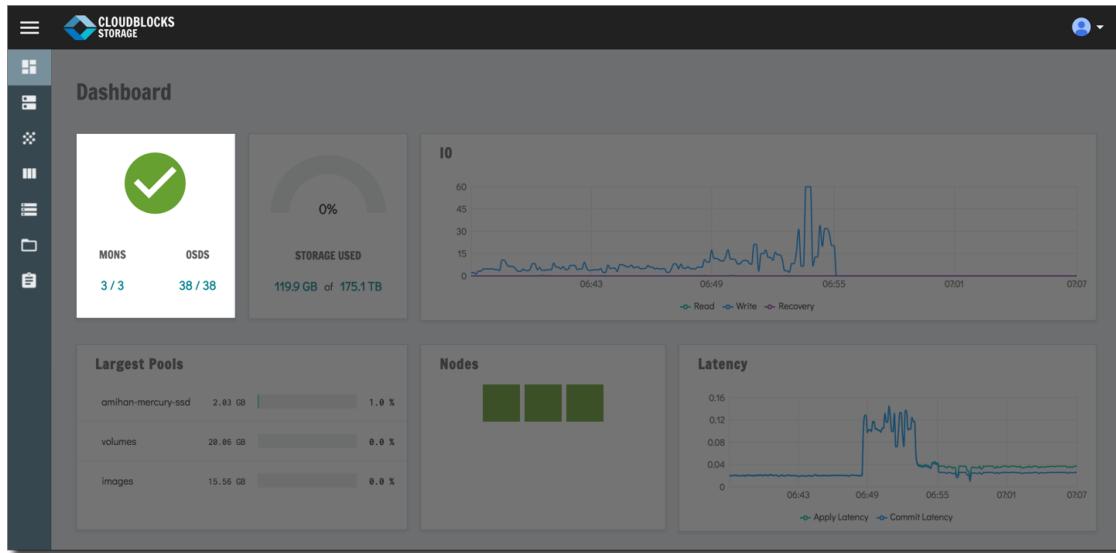
Extend Menu View

Clicking the **CloudBlocks logo** on the upper left corner of the page extends the menus for better navigation. Clicking it again hides the menus but displays its corresponding icons.



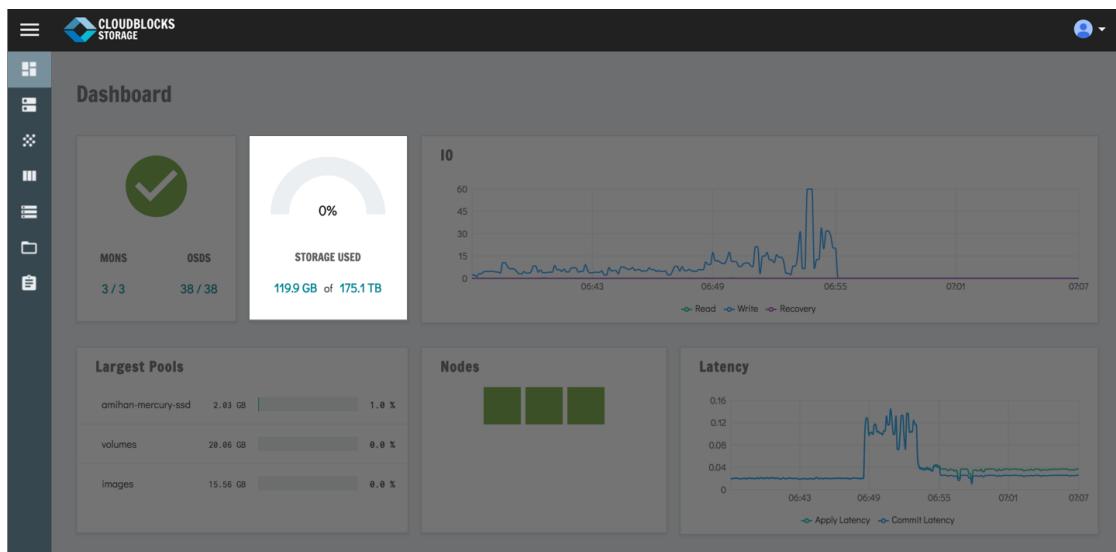
Ceph Health

This column monitors the health and status of the disks and alerts you for any warnings or errors, if any.



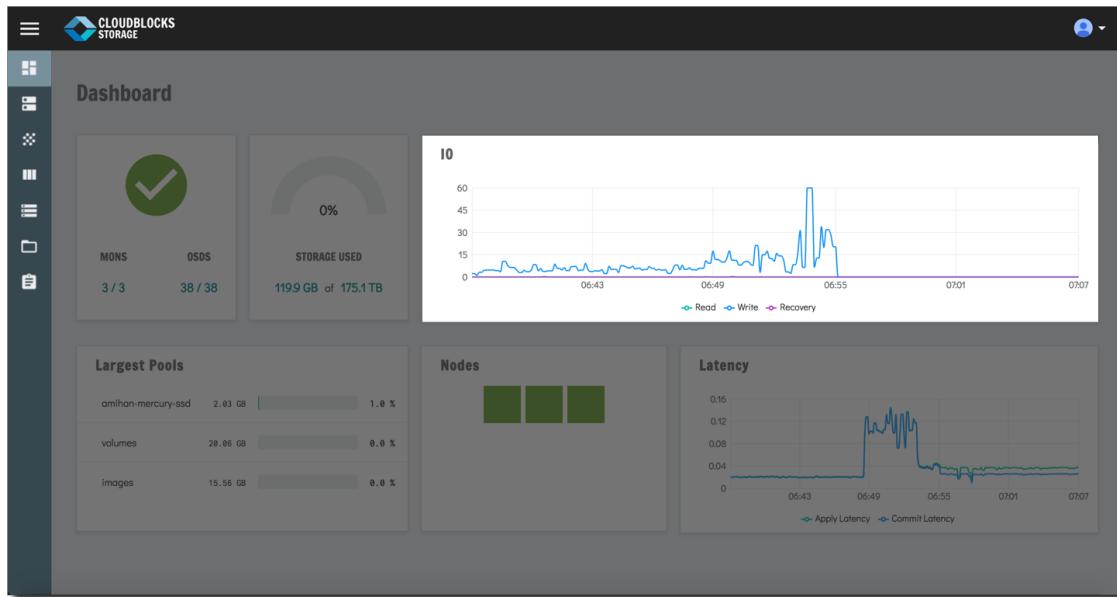
Storage Used

This column of the Dashboard tab displays the amount of storage used in the system. The storage data is displayed in percent. Total number of disks are displayed in Gigabyte (GB) or Terabyte (TB).



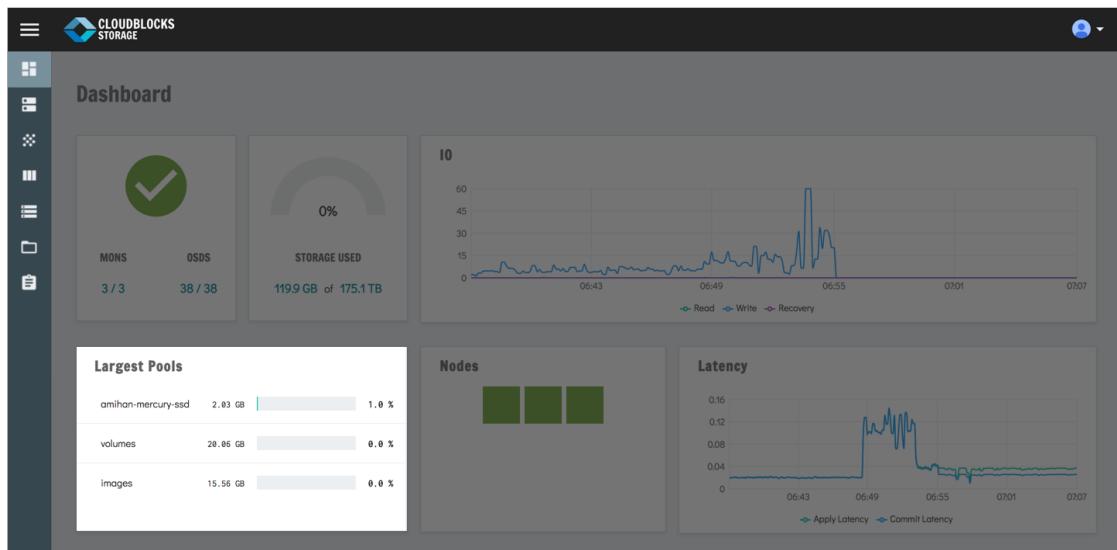
10

The *IO* (Input/Output) graph is a performance measurement showing the amount of data bandwidth (in MB/s) being used by clients for reading or writing and any ongoing data recovery.



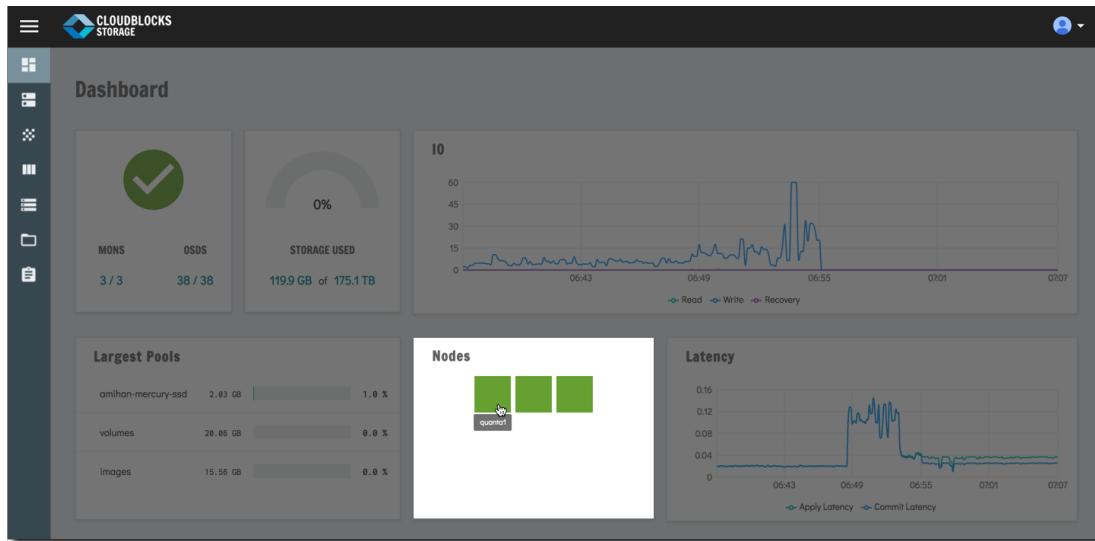
Largest Pools

The *Largest Pools* column displays the top three pools that have the most data.



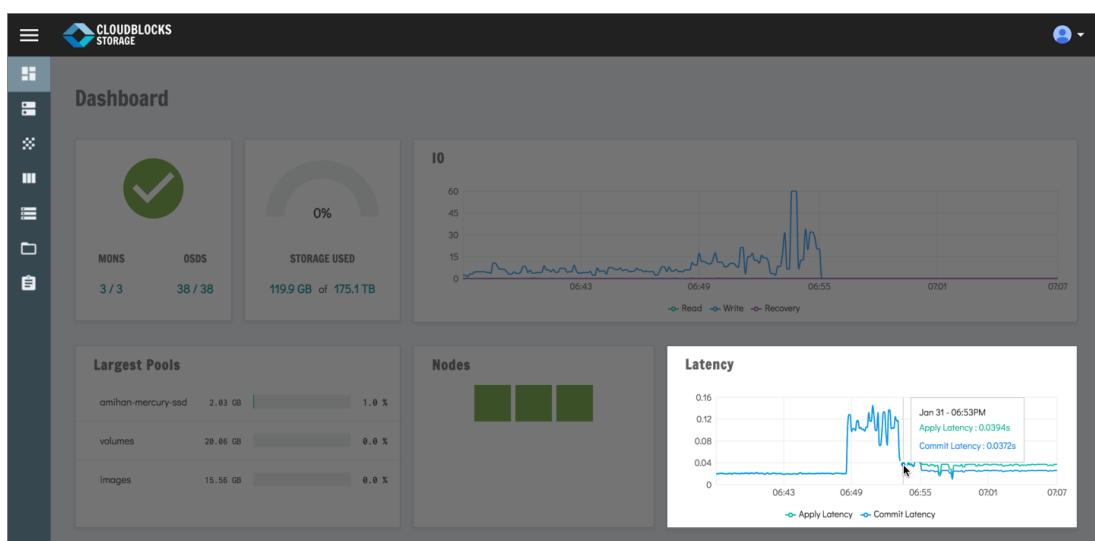
Nodes

This column provides an overview of the number of nodes available in the Acaleph cluster. This column also shows the health of each node, which changes when a node has errors or warnings. Clicking a node opens the Nodes page and display a more detailed overview of the selected node.



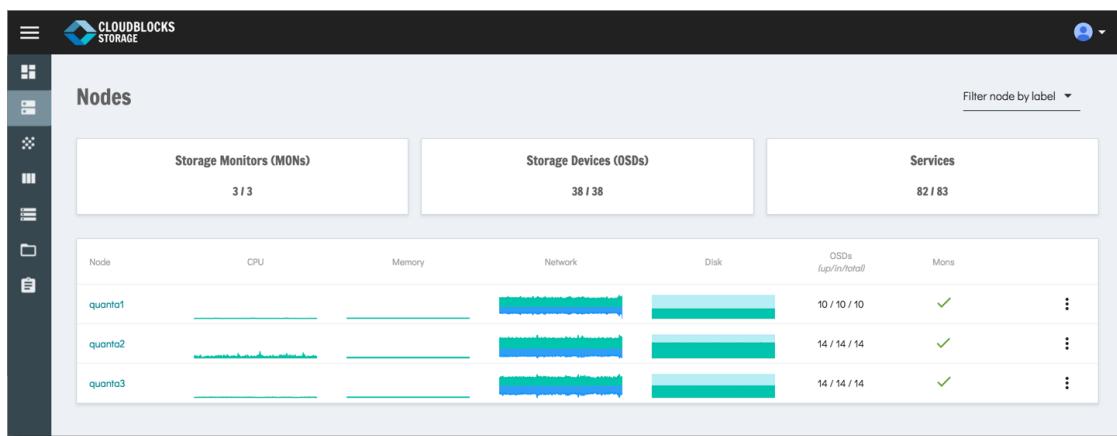
Latency

Latency is shows the amount of time it takes for data to be stored on a disk once it hits Ceph. This is an indicator for disks in a cluster becoming overloaded as it stores data. **Commit Latency** is the amount of time it takes for a write to hit the journal and then get written to disk. The **Apply Latency** is time it takes to get from after the journal to be written to disk.



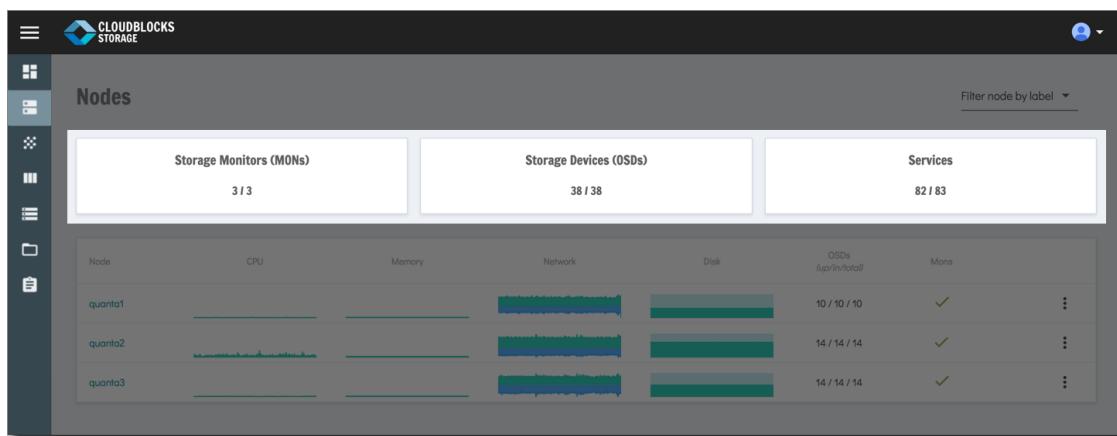
Nodes

Nodes are servers in the Acaleph Cluster. Nodes are also referred to as **Hosts**. The Nodes tab provides a quick overview of the storage monitors, number of storage devices, and services running in the system. All nodes are lined up and displayed in list format. At a glance, you are able to see the status of each node along with its current resource utilization presented in graphs. Clicking a node will provide a much better overview of the resources used.

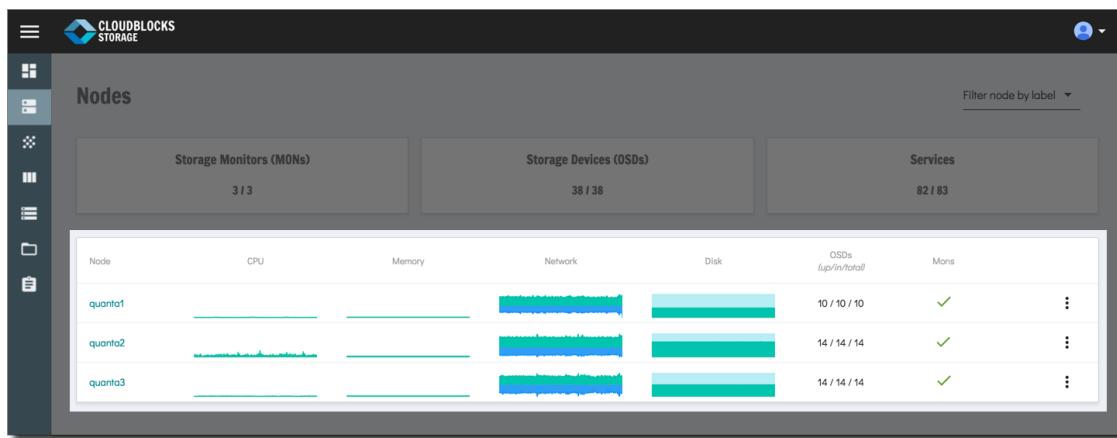


Nodes List

At first glance, you will notice that the *Nodes* tab has two sections. The upper section displays all the resources available in the Acaleph cluster.



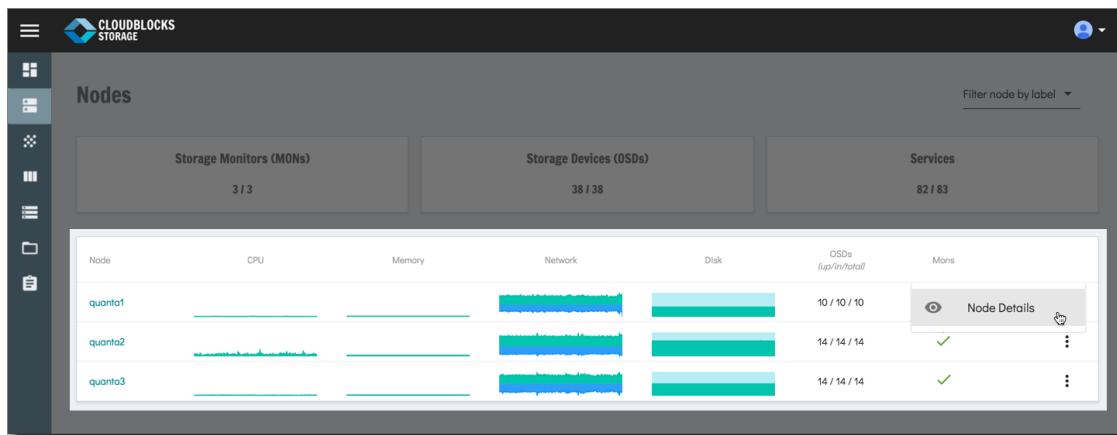
The lower section displays the nodes arranged in rows with each node having a capacity indicator to keep track of the load. Clicking a node opens a new page to display more details on resource usage.



Node	CPU	Memory	Network	Disk	OSDs (up/in/total)	Mons
quanta1	<div style="width: 50%;"></div>	<div style="width: 50%;"></div>	<div style="width: 100%; background-color: #007bff;"></div>	<div style="width: 100%; background-color: #007bff;"></div>	10 / 10 / 10	✓
quanta2	<div style="width: 50%;"></div>	<div style="width: 50%;"></div>	<div style="width: 100%; background-color: #007bff;"></div>	<div style="width: 100%; background-color: #007bff;"></div>	14 / 14 / 14	✓
quanta3	<div style="width: 50%;"></div>	<div style="width: 50%;"></div>	<div style="width: 100%; background-color: #007bff;"></div>	<div style="width: 100%; background-color: #007bff;"></div>	14 / 14 / 14	✓

Node Details

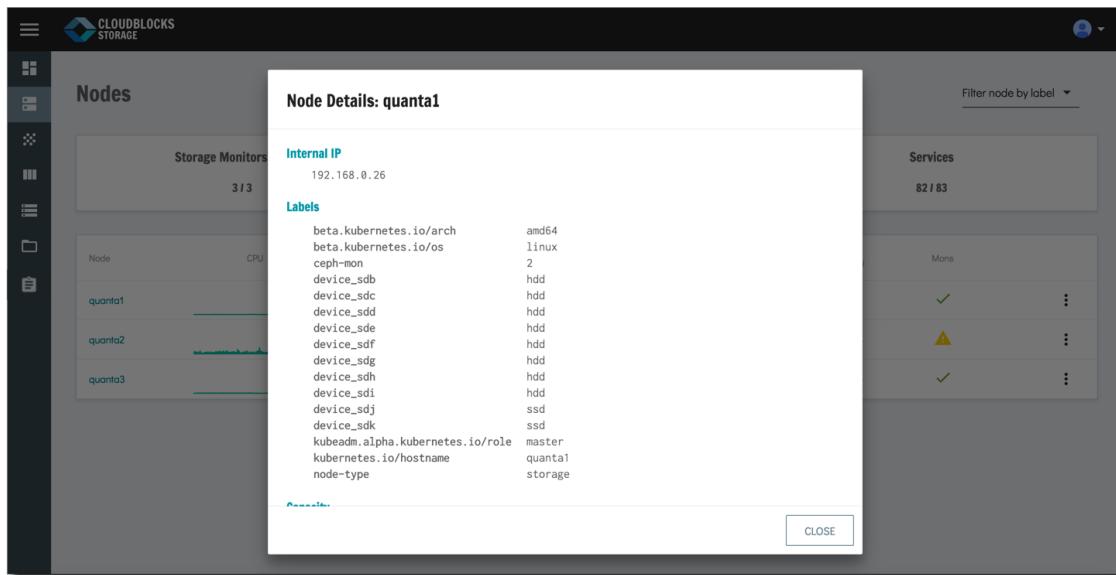
Clicking the **Node Details** option displays a list of resources available in that specific node.



These resources are as follows:

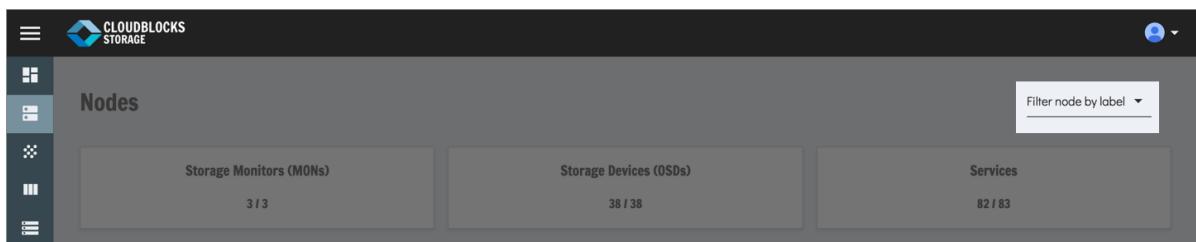
- **Internal IP** – displays the internal IP assigned to the node
- **Labels** – are key/value pairs attached to objects, such as pods and can be used to organize and to select subsets of objects. Each object can have a set of key/value labels defined.

- **Capacity** – displays the cpu, memory, and pods capacity
- **Node Info** – displays the operating system, OS image, architecture, and all other relevant info on the node



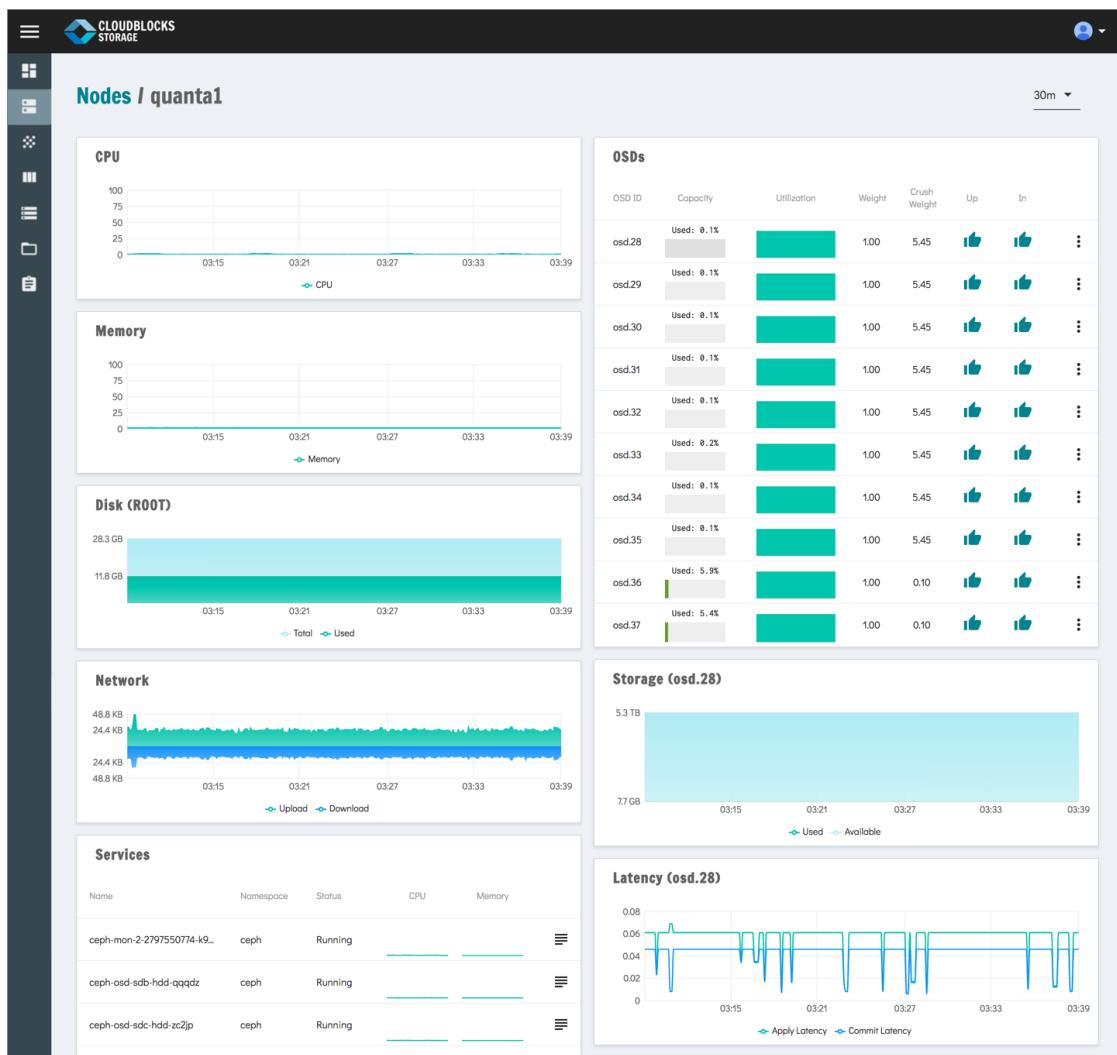
Node Filter

The **Filter** feature allows you to sort out and display specific node based on a selected label. To do this, simply click the drop-down menu on the upper right corner of the page. Once a label is selected, Dashboard displays all the nodes according to specified label.



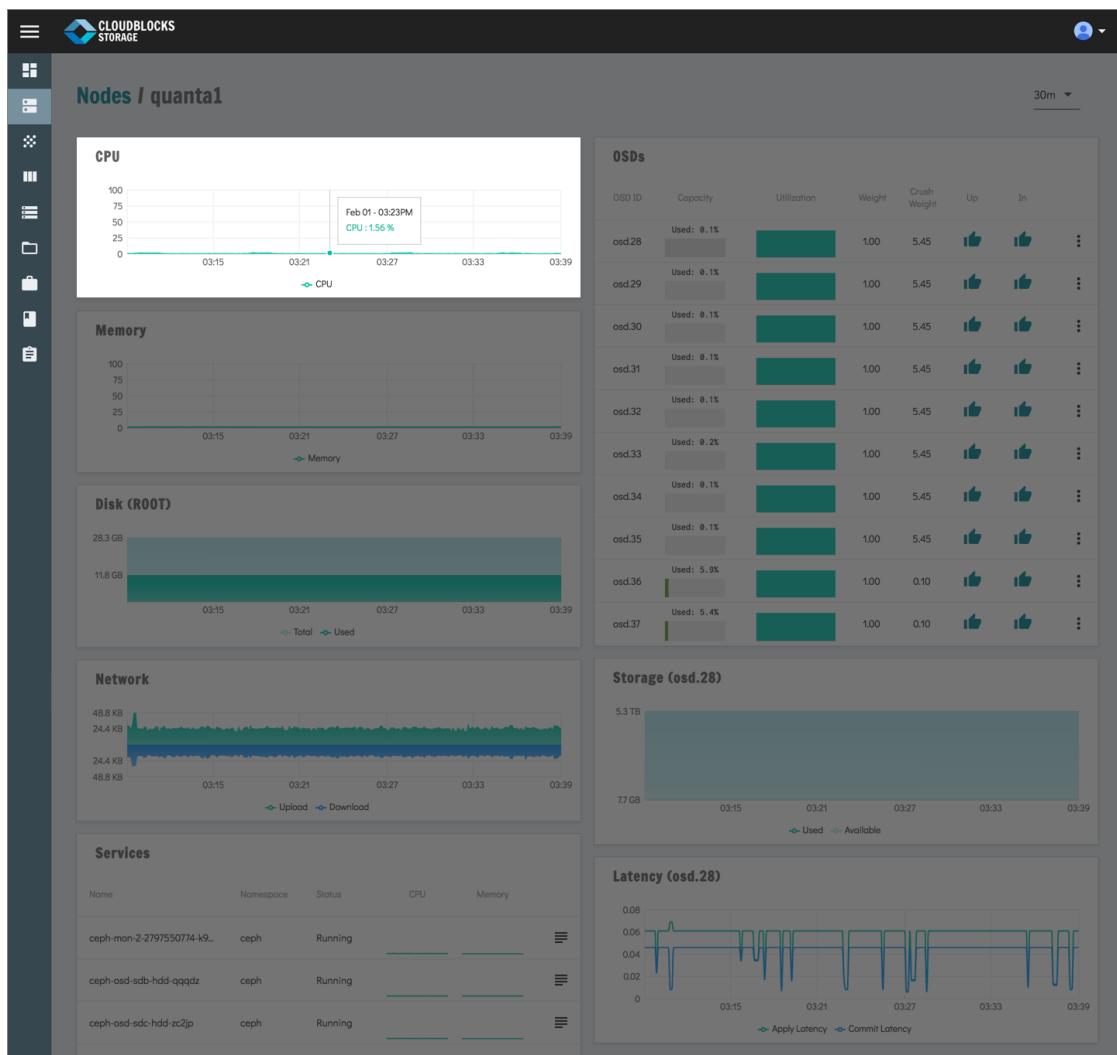
Node Full Details

Selecting a node in the *Nodes* page displays all its available resources in full detail. This page consists of graphs and other useful information to help simplify monitoring of OSDs in each node. Since data is collected over time and may be too large to visualize as a whole, the graphs provide a way to report data in a concise and meaningful way.



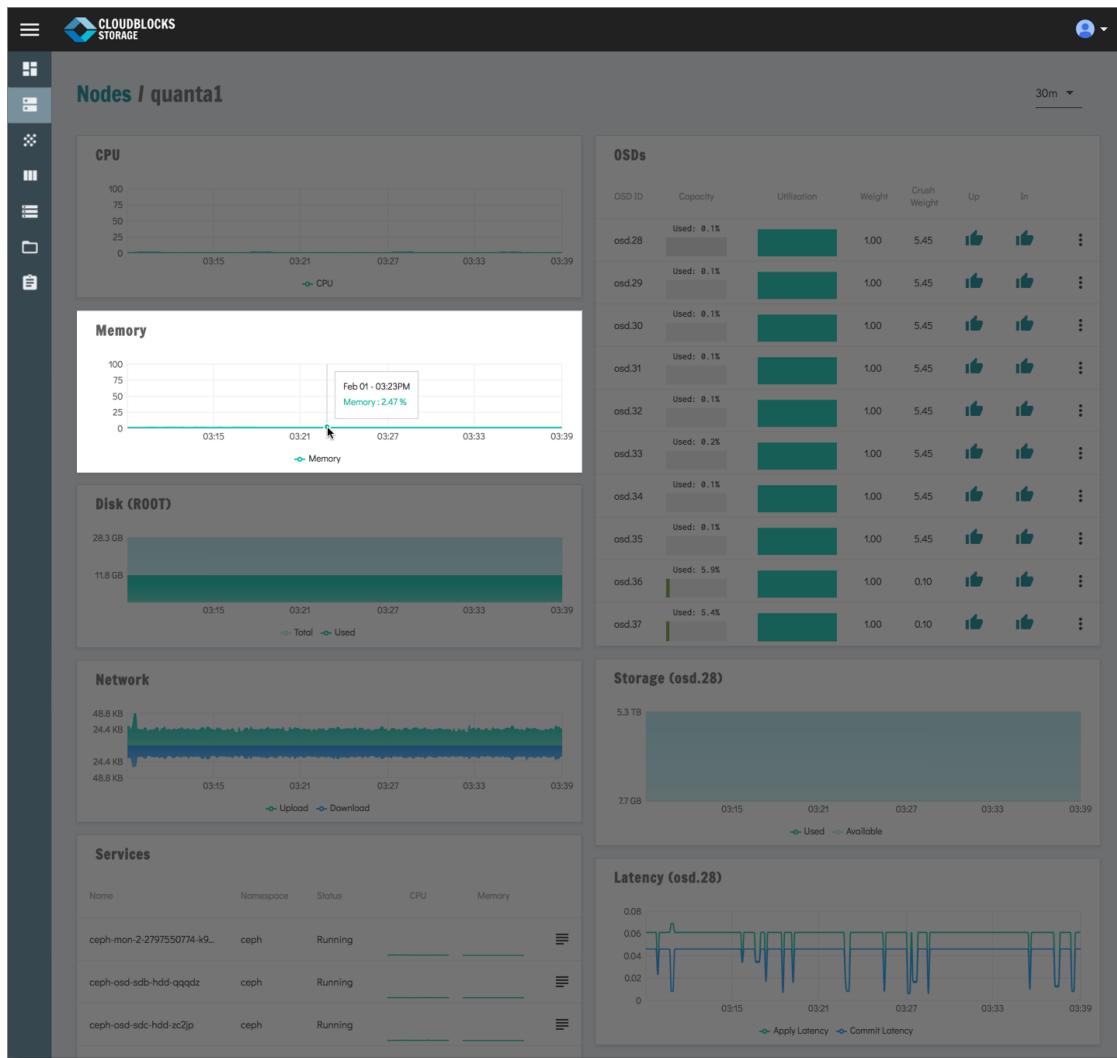
CPU Graph

The **CPU** graph is a utility that monitors the usage of the node's processing cores and displays the current CPU load the node consumes. The numbers at the left side of the graph show the number of CPU utilization in percent and the digits at the bottom show the time on the server. Hover your mouse in the graph to check the specific time and current CPU load percentage.



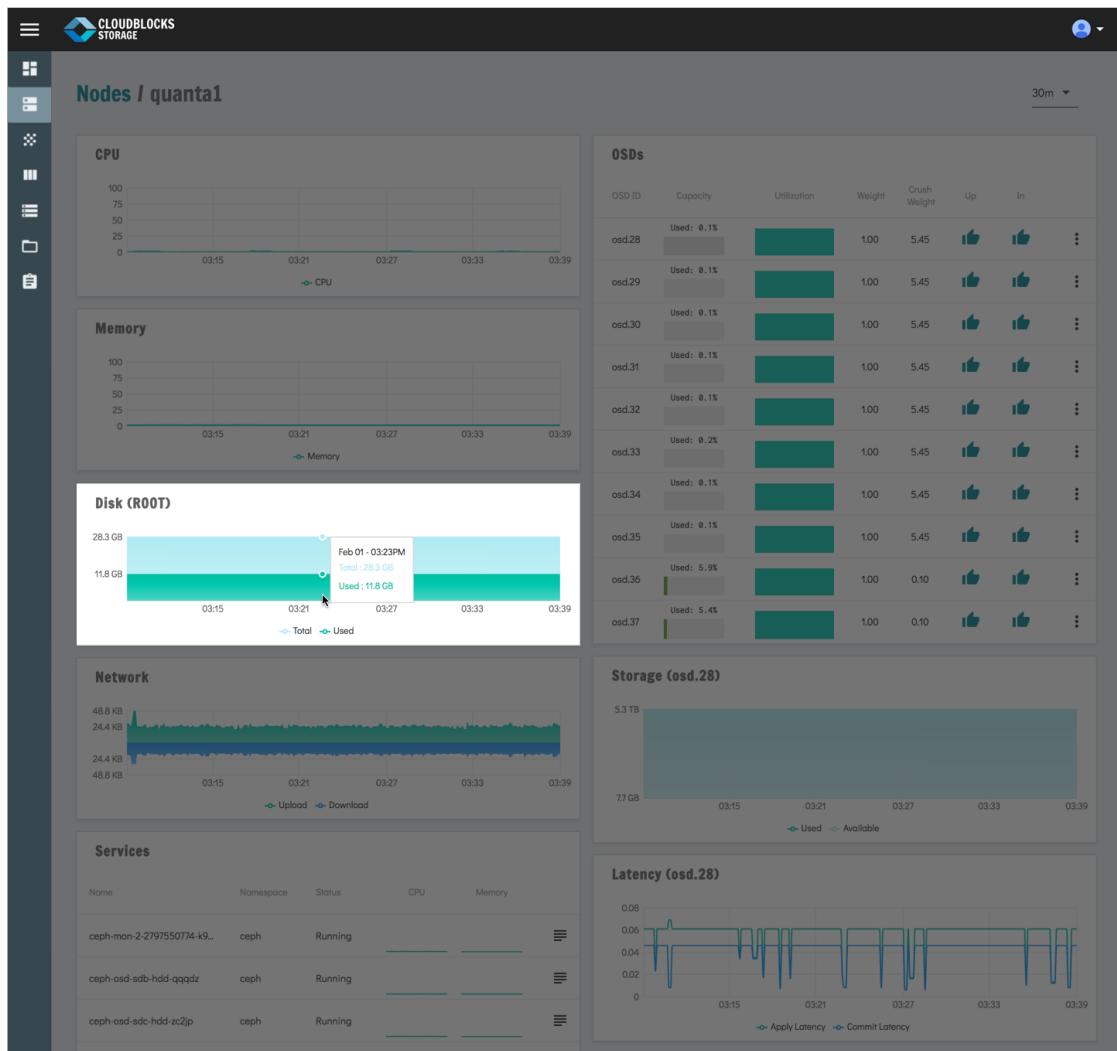
Memory Graph

The **Memory** graph helps illustrate the availability of memory resources and visualizes the amount of memory being utilized by the node. The numbers at the left side of the graph show the number of memory utilization in percent and the digits at the bottom show the time on the server. Hover your mouse in the graph to check the specific time and current memory load percentage.



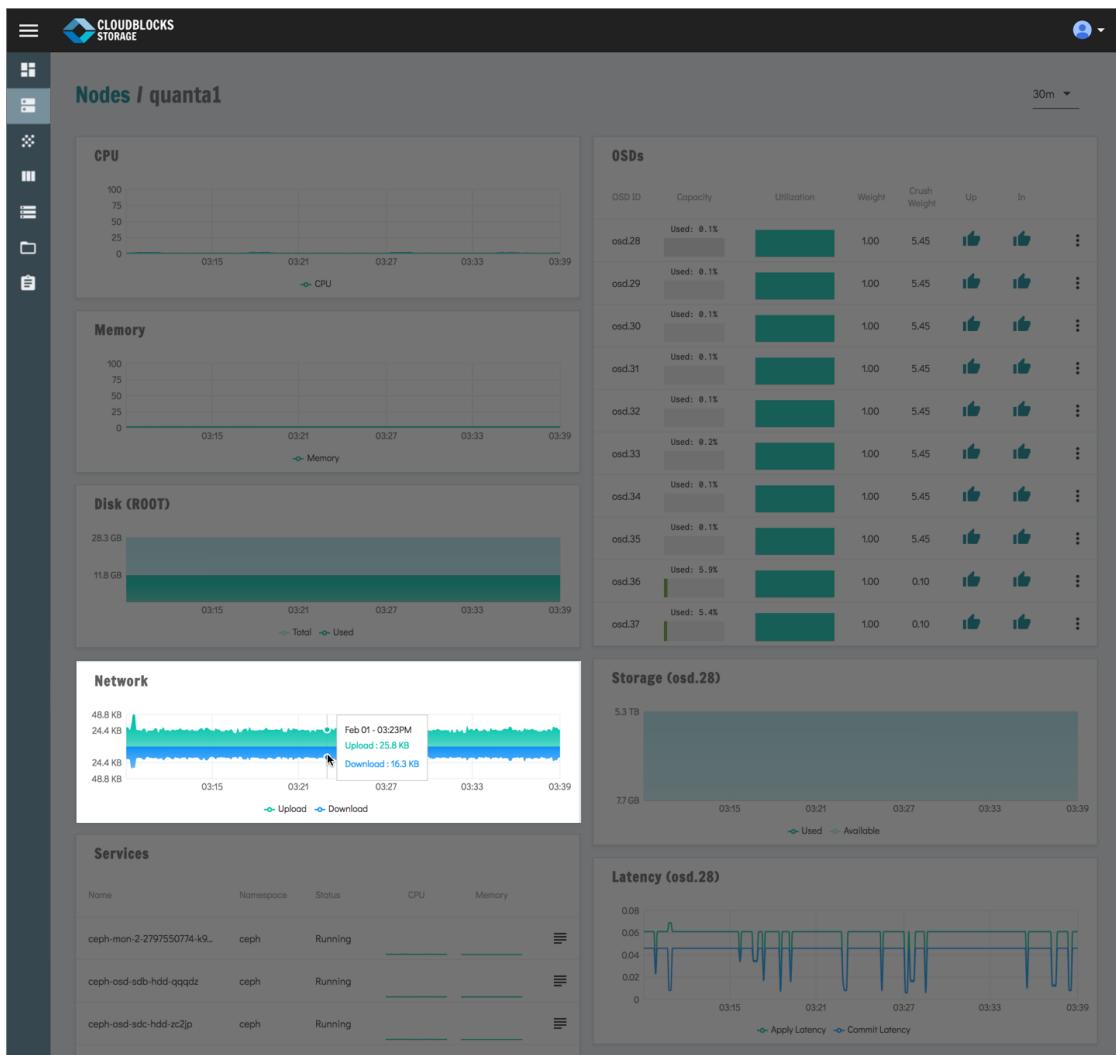
Disk (Root) Graph

The **Disk (Root)** graph provides a summary of the overall disk usage. This measures the total number of bytes available and the number of bytes used in the node's root disk. Hover your mouse in the graph to check disk information.



Network Graph

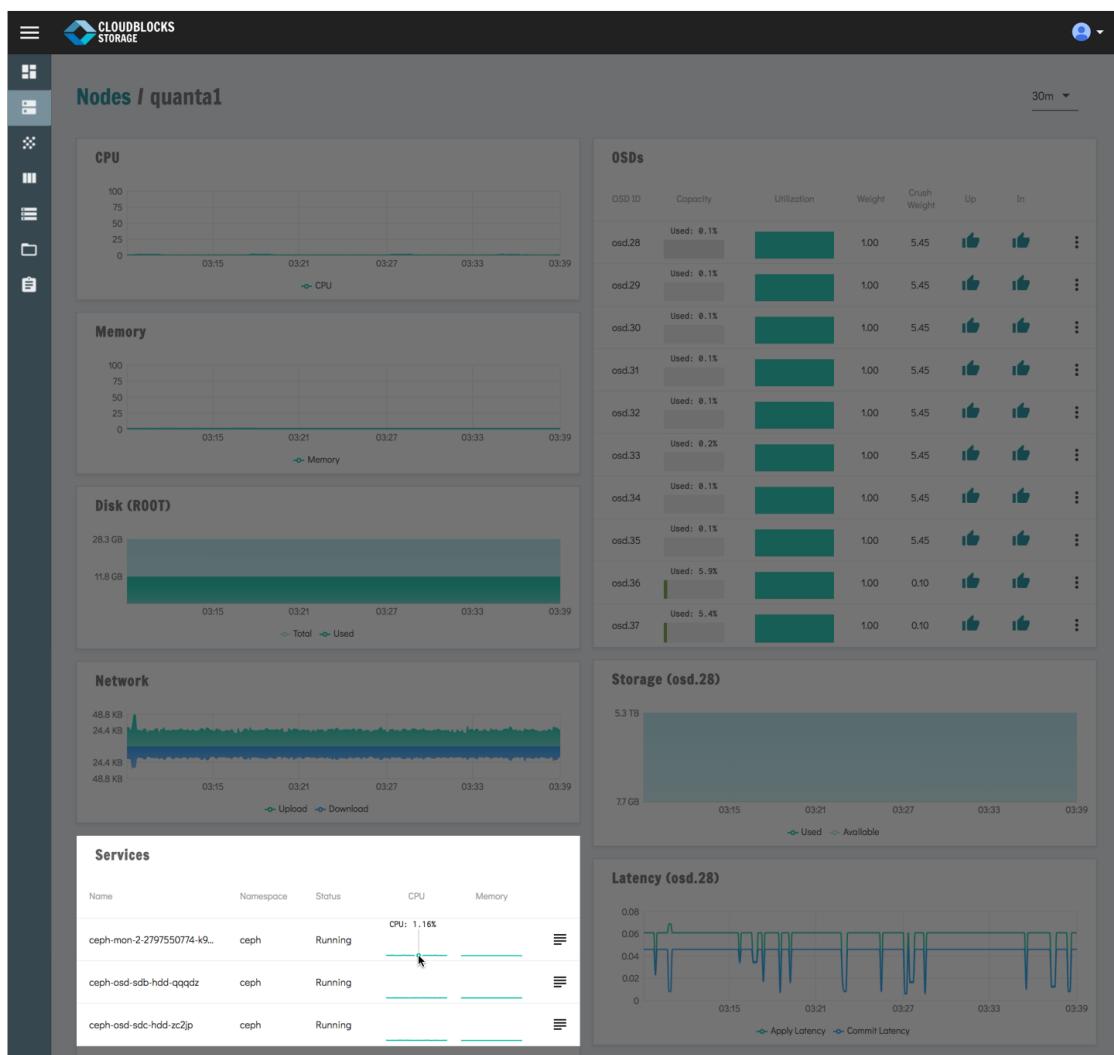
The **Network** graph monitors the usage of the node's network utilization. The numbers at the left side of the graph show the network speed in megabytes and the digits at the bottom show the time on the server. Hovering your mouse in the graph displays the network's upload and download speed at any given point in time.



Services

A **Service** is an abstraction which defines a logical set of pods and a policy by which to access them. The Services list provides you with the following details:

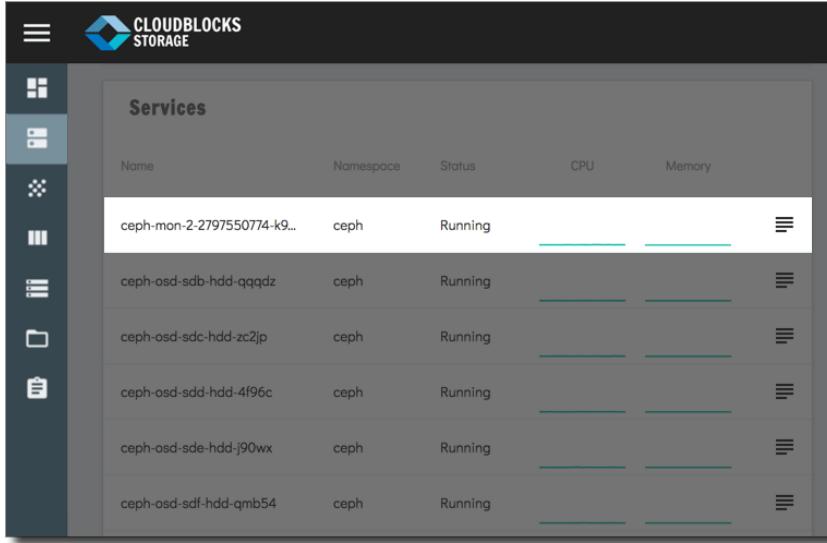
- **Name** – the name of the service
- **Namespace** – a way to divide cluster resources between multiple uses. These are intended for use in environments with many users spread across multiple teams, or projects.
- **Status** – the current condition of the service
- **CPU** – the current CPU usage of the service
- **Memory** – the current memory usage of the service



Logs

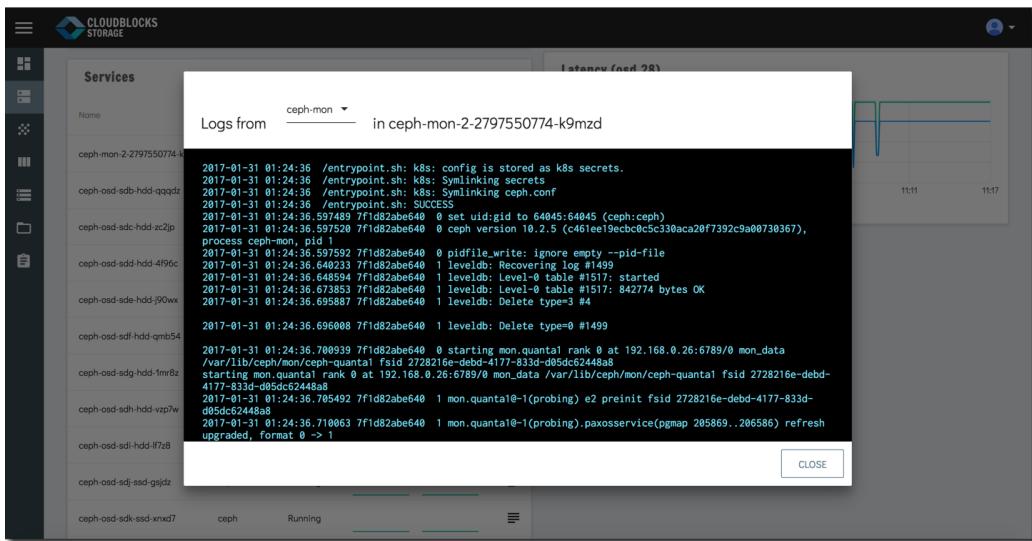
To display the log files of a service, follow these steps:

1. Select a service from the Services list.



Name	Namespace	Status	CPU	Memory
ceph-mon-2-2797550774-k9...	ceph	Running	<div style="width: 50%;"> </div>	<div style="width: 50%;"> </div>
ceph-osd-sdb-hdd-qqqdz	ceph	Running	<div style="width: 50%;"> </div>	<div style="width: 50%;"> </div>
ceph-osd-sdc-hdd-zc2jp	ceph	Running	<div style="width: 50%;"> </div>	<div style="width: 50%;"> </div>
ceph-osd-sdd-hdd-4f96c	ceph	Running	<div style="width: 50%;"> </div>	<div style="width: 50%;"> </div>
ceph-osd-sde-hdd-j90wx	ceph	Running	<div style="width: 50%;"> </div>	<div style="width: 50%;"> </div>
ceph-osd-sdf-hdd-qmb54	ceph	Running	<div style="width: 50%;"> </div>	<div style="width: 50%;"> </div>

2. Click the button on the right of the selected service. The *Logs from <service>* window displays.



```

Logs from ceph-mon in ceph-mon-2-2797550774-k9mzd

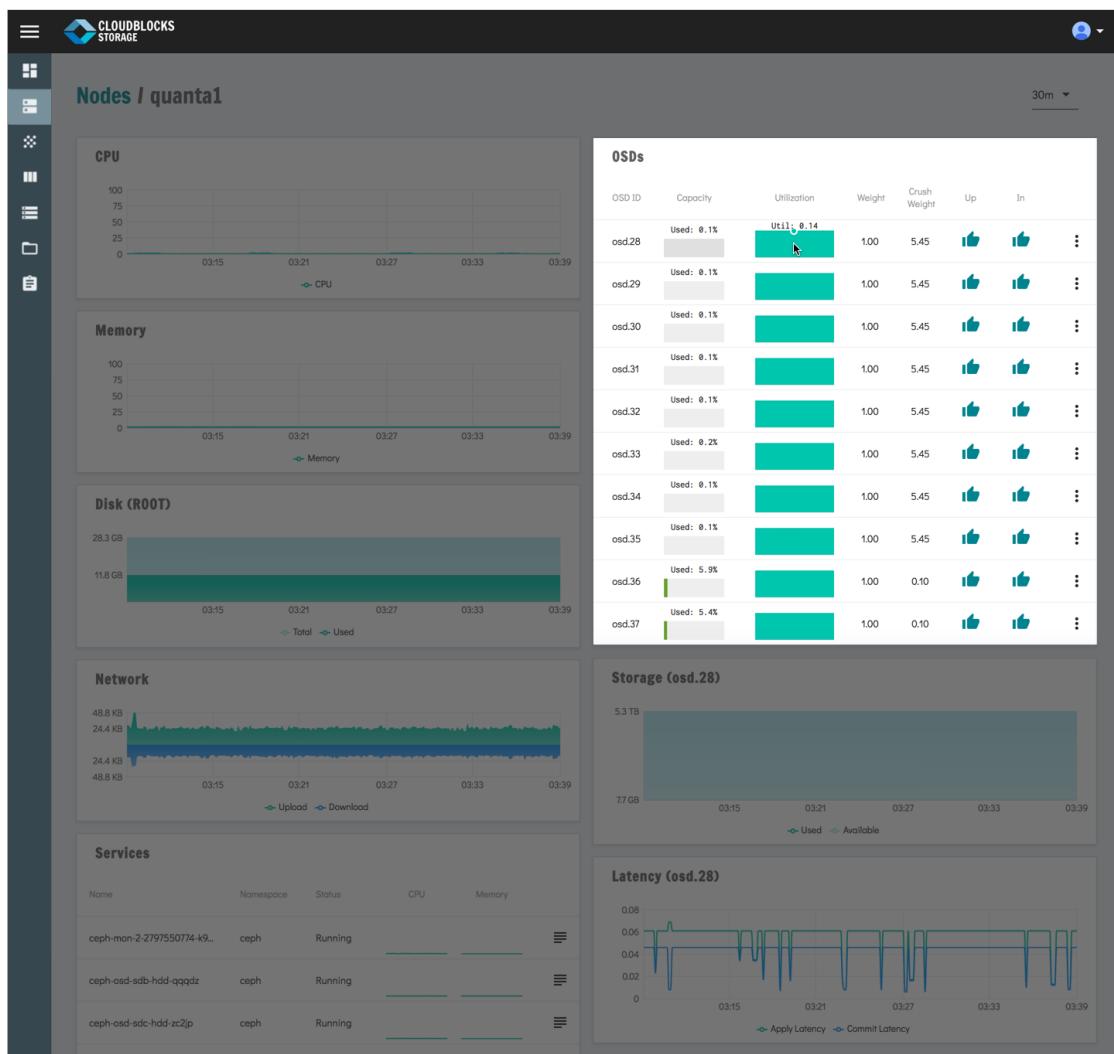
2017-01-31 01:24:36 /entrypoint.sh: k8s: config is stored as k8s secrets.
2017-01-31 01:24:36 /entrypoint.sh: k8s: Symlinking secrets
2017-01-31 01:24:36 /entrypoint.sh: k8s: Symlinking ceph.conf
2017-01-31 01:24:36 /entrypoint.sh: SUCCESS
2017-01-31 01:24:36.597489 7ffd82abe640 0 set uid:gid to 64045:64045 (ceph:ceph)
2017-01-31 01:24:36.597520 7ffd82abe640 0 ceph version 10.2.5 (c461ee9ecbc8c5c338aca28f7392c9a00730367),
process ceph-mon, pid 1
2017-01-31 01:24:36.597592 7ffd82abe640 0 pidfile_write: ignore empty --pid-file
2017-01-31 01:24:36.640233 7ffd82abe640 1 level: Recovering log #1499
2017-01-31 01:24:36.648594 7ffd82abe640 1 level: Level-0 table #1517: started
2017-01-31 01:24:36.673853 7ffd82abe640 1 level: Level-0 Table #1517: 842774 bytes OK
2017-01-31 01:24:36.695867 7ffd82abe640 1 level: Delete type=3 #
2017-01-31 01:24:36.696088 7ffd82abe640 1 level: Delete type=0 #1499
2017-01-31 01:24:36.700939 7ffd82abe640 0 starting mon.quotantl rank 0 at 192.168.0.26:6789/0 mon.data
/var/lib/ceph/mon/ceph-quanta1 fsid 2728216e-debd-4177-833d-d05cd5244ba8
starting mon.quotantl rank 0 at 192.168.0.26:6789/0 mon_data /var/lib/ceph/mon/ceph-quanta1 fsid 2728216e-debd-4177-833d-d05cd5244ba8
2017-01-31 01:24:36.765492 7ffd82abe640 1 mon.quotantl-1(probing) e2 preinit fsid 2728216e-debd-4177-833d-d05cd5244ba8
2017-01-31 01:24:36.710063 7ffd82abe640 1 mon.quotantl-1(probing).paxoservice(pgmap 205869..206586) refresh
upgraded, format 0 -> 1

```


OSDs

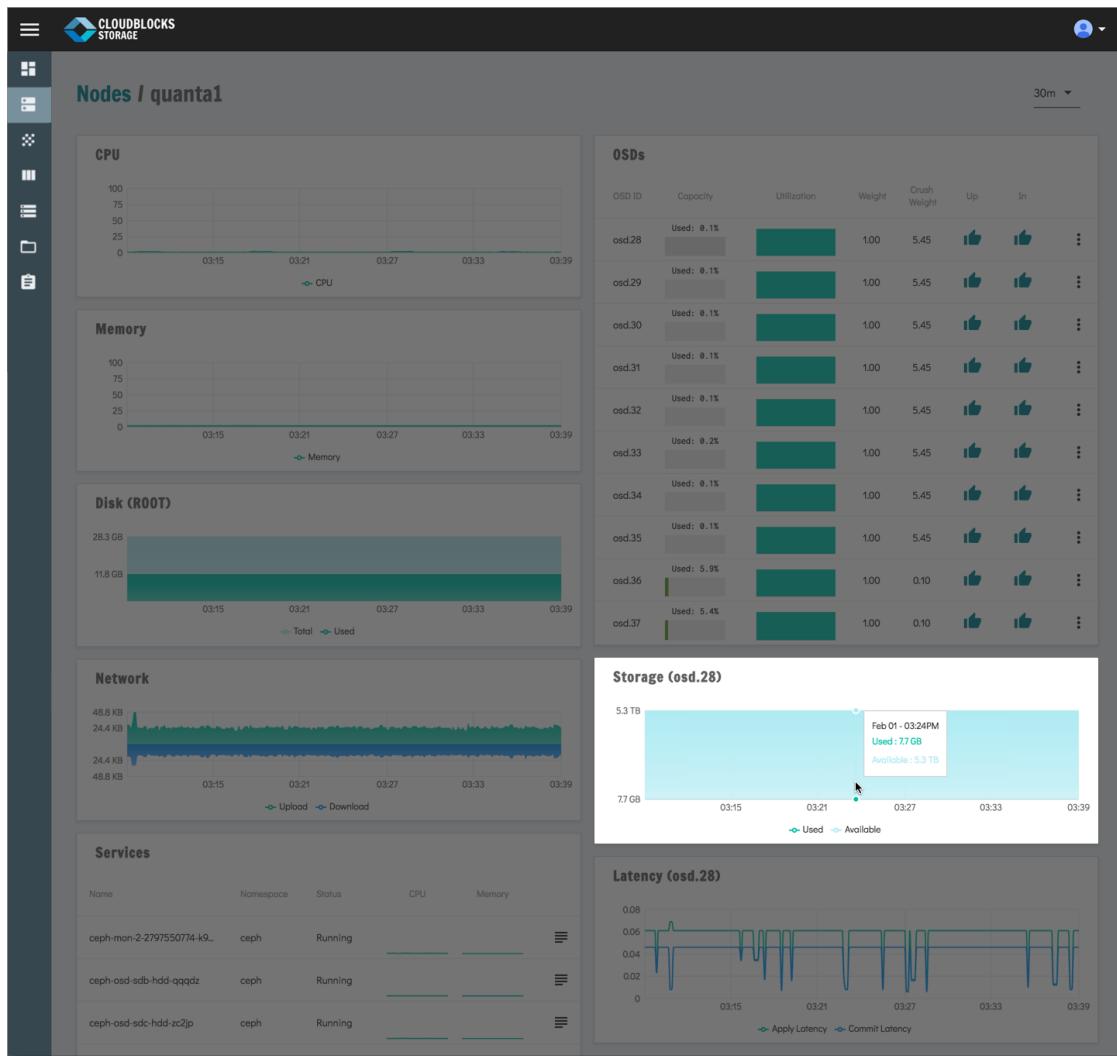
The **OSDs** section lists all available OSDs in the node. This section also provides status indicators for each osds such as capacity, utilization, weight, crush weight, up, and in. Clicking the button to the right allows you to edit and manipulate the osd by changing its weight, crush weight, to set it to down, or out.

Note: Selecting a node from the list also changes the data presented in *Storage graph* and *Latency* graph.



Storage Graph

The **Storage** graph displays the amount of storage available and storage consumed per osd. Hovering your mouse displays the current storage capacity of the selected osd.

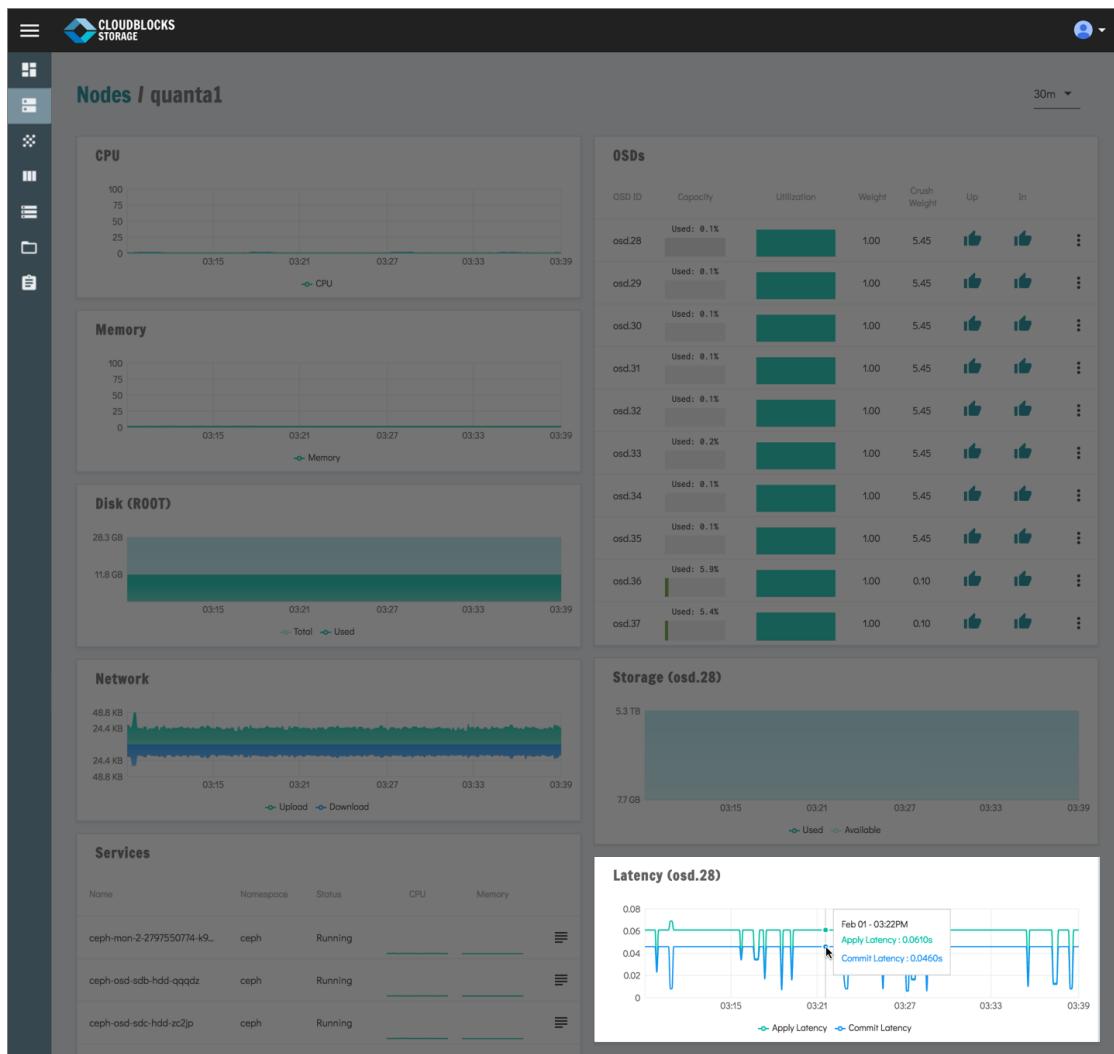


Latency Graph

Latency shows the amount of time it takes for data to be stored on a disk once it hits Ceph. This is an indicator for disks in a cluster becoming overloaded as it stores data.

Commit Latency is the amount of time it takes for a write to hit the journal and then get written to disk. The **Apply Latency** is time it takes to get from after the journal to be written to disk.

Hovering your mouse on the graph displays the latency information on the selected node.



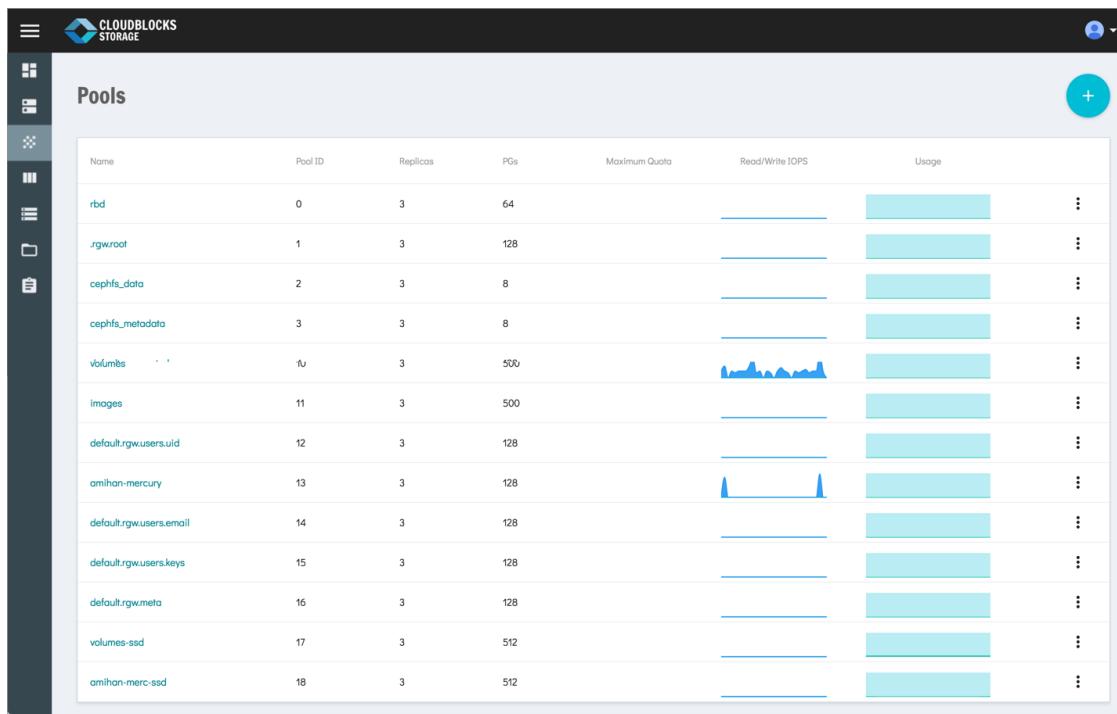
Filter By Time Period

The **Filter** feature allows you to view specific node details based on a selected period of time. This refines and sorts out the data you wanted to view without including other data that may be irrelevant. To do this, simply click the time period on the upper right corner of the page. Once a time period is selected, Dashboard displays all the node details according to specified period.



Pools

Pools are logical groupings of data in a cluster. This data can include volumes, objects and other metadata. This tab allows pool partitions to be managed and created. This includes setting performance and replication for each pools.



The *Pools* page has the following information:

Header	Description
Name	the name of the pool
Pool ID	the pool identifier
Replicas	the desired number of copies for the pool
PGs	placement groups aggregates a series of objects into a group, and maps the group to a series of OSDs
Maximum Quota	the maximum size allowable for each pool
Read/Write IOPS	performance measurement for sequential read/write processes

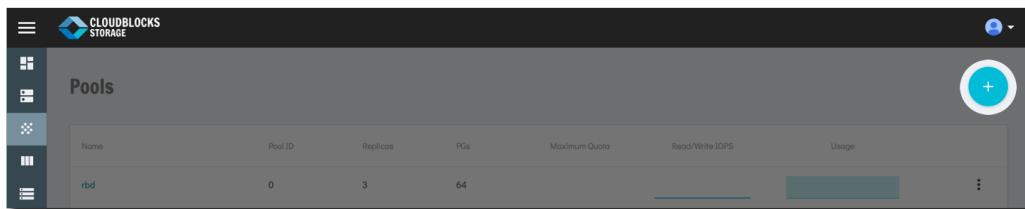
Usage

measures the disk usage of the pool

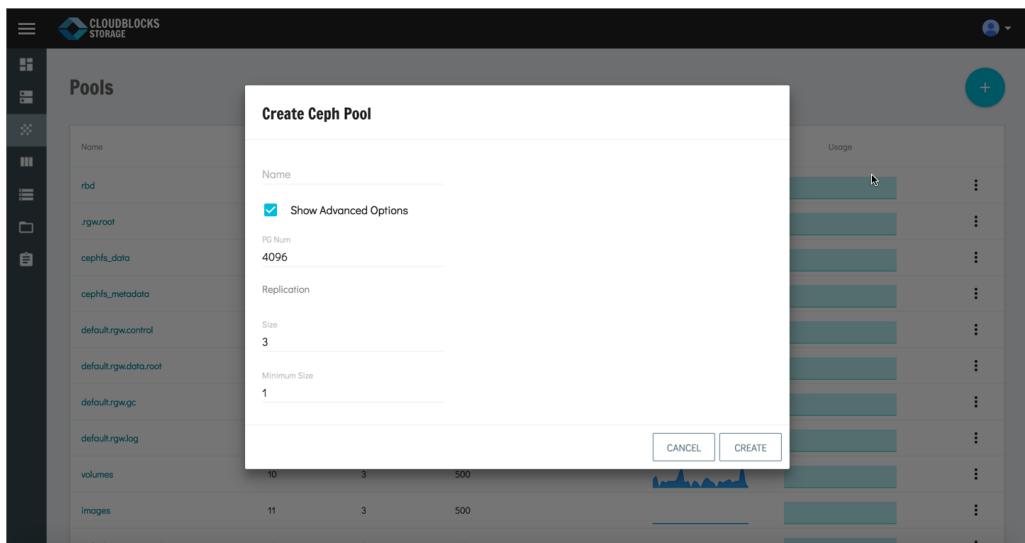
Create New Pool

To create a new pool, follow the steps outlined below.

1. Click the create button on the upper right corner of the page. The *Create Ceph Pool* window displays.



2. Click the **Show Advanced Options** check box to display all other options. Enter the name of the pool, number of PGs, specify replication size, and the minimum size of the pool.

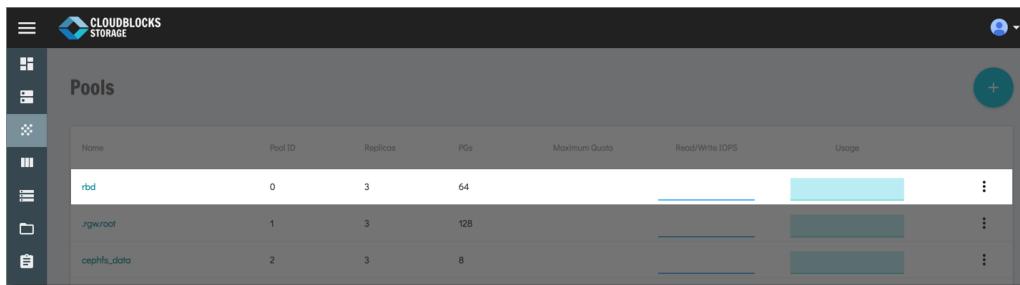


3. Click **Create** to create the new pool.

View Pool Info

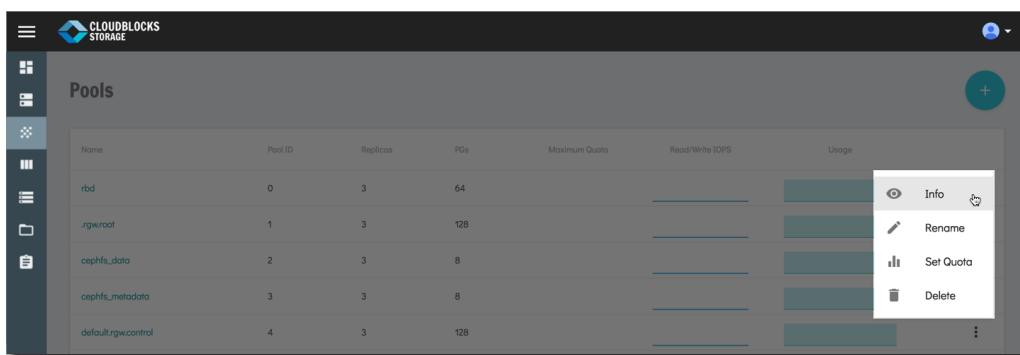
To view pool information, follow these steps:

1. Select a pool from the list and click the dotted icon to the right.



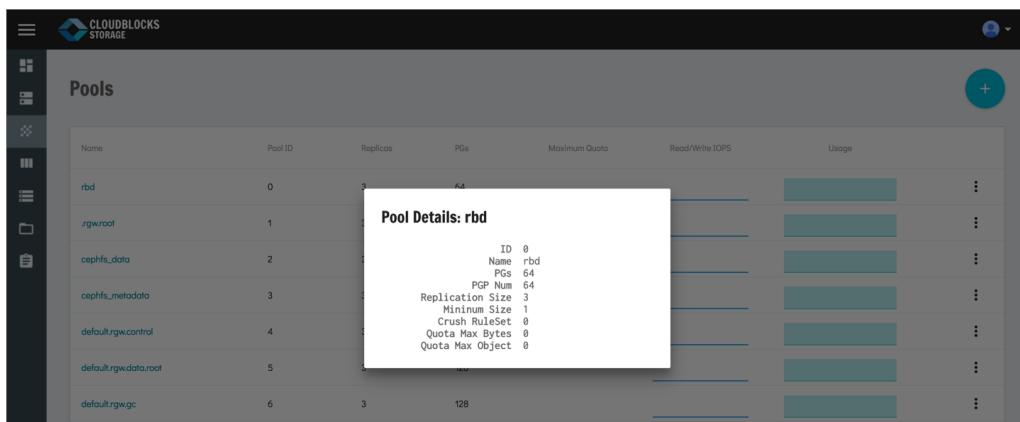
Name	Pool ID	Replicas	PGs	Maximum Quota	Read/Write IOPS	Usage	⋮
rbd	0	3	64				⋮
.rgw.root	1	3	128				⋮
cephfs_data	2	3	8				⋮

2. Select **Info** from the drop-down menu. The *Pool Details* window displays.



Name	Pool ID	Replicas	PGs	Maximum Quota	Read/Write IOPS	Usage	⋮
rbd	0	3	64				⋮
.rgw.root	1	3	128				⋮
cephfs_data	2	3	8				⋮
cephfs_metadata	3	3	8				⋮
default.rgw.control	4	3	128				⋮

3. Review the pool details. Close the window by clicking anywhere in the page.



Name	Pool ID	Replicas	PGs	Maximum Quota	Read/Write IOPS	Usage	⋮
rbd	0	3	64				⋮
.rgw.root	1	3	128				⋮
cephfs_data	2	3	8				⋮
cephfs_metadata	3	3	8				⋮
default.rgw.control	4	3	128				⋮
default.rgw.data.root	5	3	128				⋮
default.rgw.gc	6	3	128				⋮

Pool Details: rbd

```

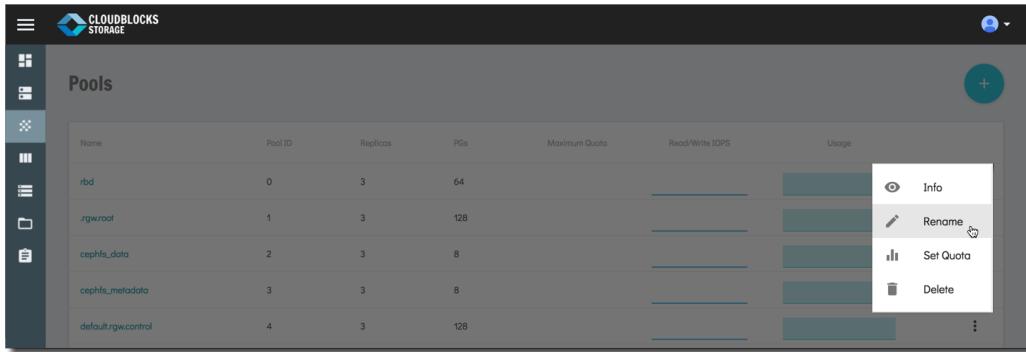
ID: 0
Name: rbd
PGs: 64
PGP Num: 64
Replication Size: 3
Minimum Size: 1
Crush RuleSet: 0
Quota Max Bytes: 0
Quota Max Object: 0

```


Rename Pool

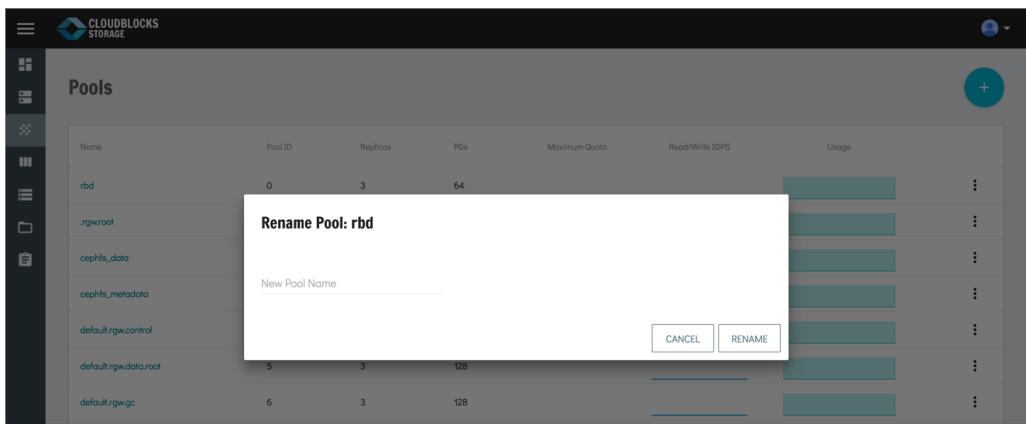
To rename a pool, follow the steps below.

1. Click the icon to the right and select **Rename**. The *Rename Pool* window displays.



Name	pool ID	Replicas	PGs	Maximum Quota	ReadWrite IOPS	Usage	Actions
rbd	0	3	64				
.rgw.root	1	3	128				
cephfs_data	2	3	8				
cephfs_metadata	3	3	8				
default.rgw.control	4	3	128				

2. Enter the new name and click **Rename**.

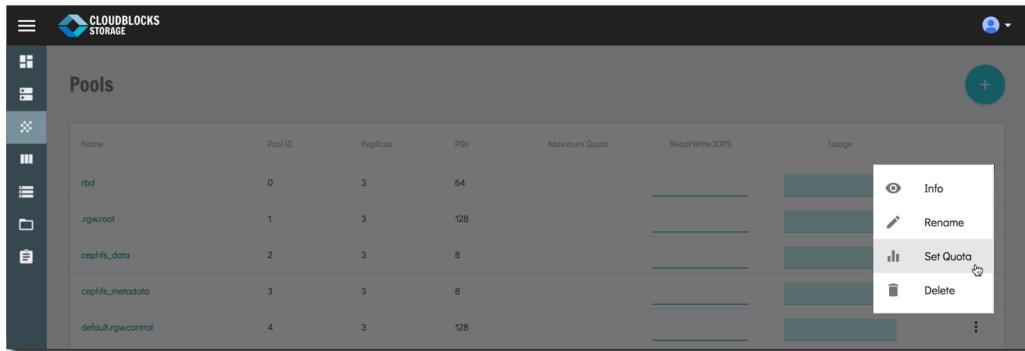


Name	pool ID	Replicas	PGs	Maximum Quota	ReadWrite IOPS	Usage	Actions
rbd	0	3	64				
.rgw.root	1						
cephfs_data	2						
cephfs_metadata	3						
default.rgw.control	4						
default.rgw.data.root	5	3	128				
default.rgw.gc	6	3	128				

Set Pool Quota

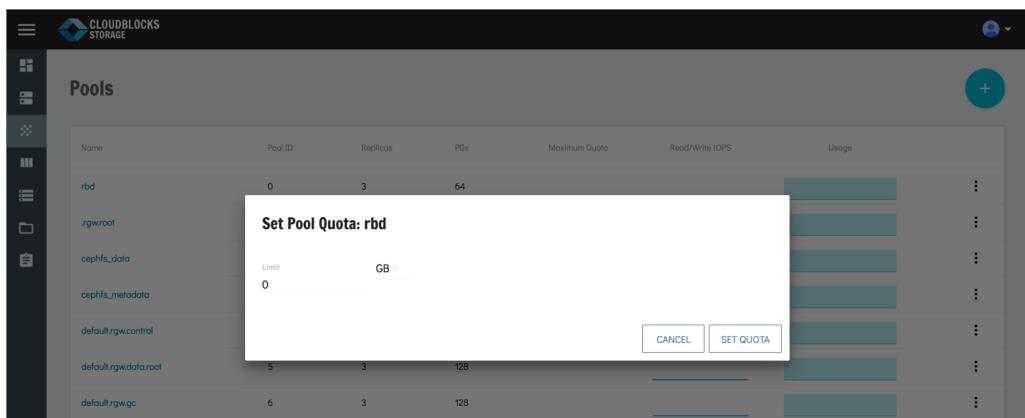
To set a pool quota, follow the steps below.

1. Click the icon to the right and select **Set Quota**. The Set Pool Quota window displays.



Name	Pool ID	Replicas	PGs	Maximum Quota	ReadWrite IOPS	Usage	Actions
rbd	0	3	64				⋮
.rgw.root	1	3	128				⋮
cephfs_data	2	3	8				⋮
cephfs_metadata	3	3	8				⋮
default.rgw.control	4	3	128				⋮

2. Specify the quota in the field provided and click **Set Quota**.

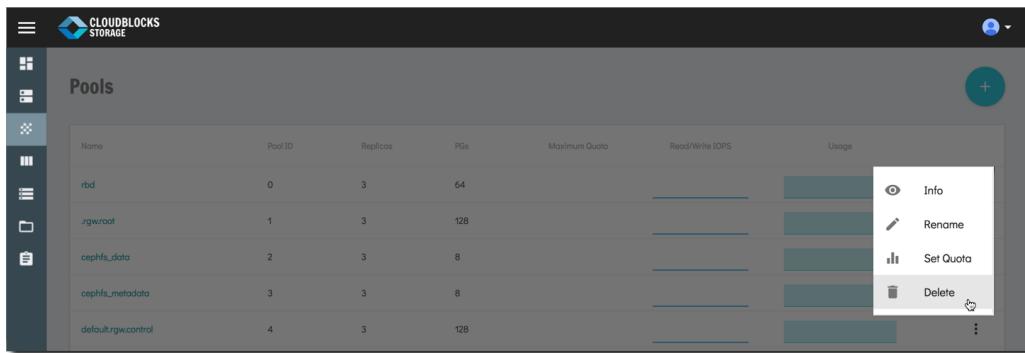


Name	Pool ID	Replicas	PGs	Maximum Quota	ReadWrite IOPS	Usage	Actions
rbd	0	3	64				⋮
.rgw.root	1	3	128				⋮
cephfs_data	2	3	8				⋮
cephfs_metadata	3	3	8				⋮
default.rgw.control	4	3	128				⋮
default.rgw.data.root	5	3	128				⋮
default.rgw.gc	6	3	128				⋮

Delete Pool

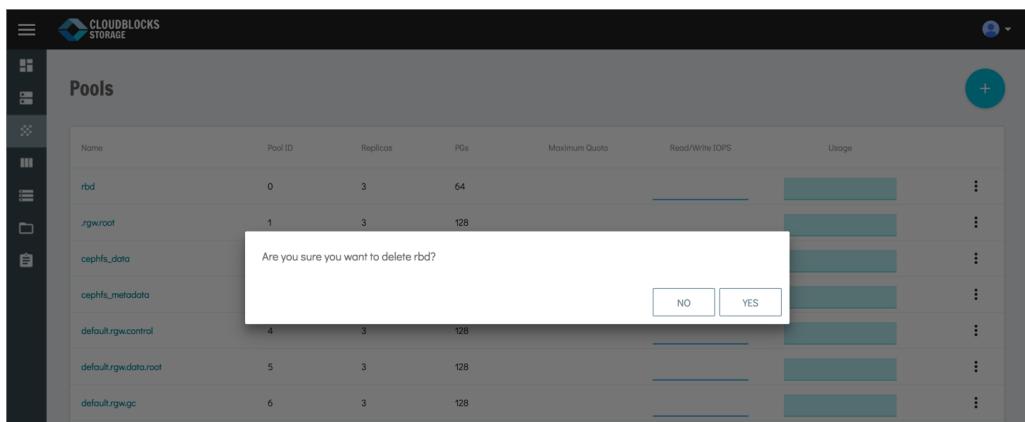
To delete a pool, follow these steps:

1. Click the icon to the right and select **Delete**. A confirmation window displays to confirm deletion.



Name	pool ID	Replicas	PGs	Maximum Quota	ReadWrite IOPS	Usage	Actions
rbd	0	3	64				⋮
.rgw.root	1	3	128				⋮
cephfs_data	2	3	8				⋮
cephfs_metadata	3	3	8				⋮
default.rgw.control	4	3	128				⋮

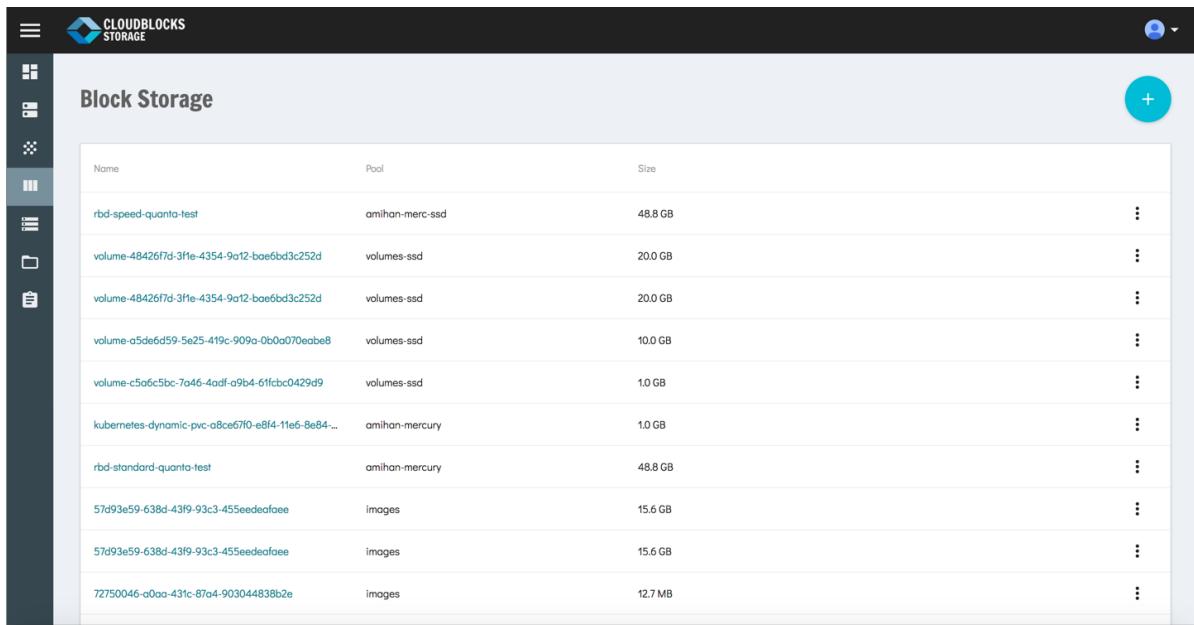
2. Click **Yes** to confirm. Note that this action cannot be undone.



Name	pool ID	Replicas	PGs	Maximum Quota	ReadWrite IOPS	Usage	Actions
rbd	0	3	64				⋮
.rgw.root	1	3	128				⋮
cephfs_data	2	3	8				⋮
cephfs_metadata	3	3	8				⋮
default.rgw.control	4	3	128				⋮
default.rgw.data.root	5	3	128				⋮
default.rgw.gc	6	3	128				⋮

Block Storage

Block storage is a type of data storage typically used in storage-area network (SAN) environments where data is stored in units referred to as blocks. This is the typical native storage interface of most storage media at the driver level. Block Storage offers better performance and speed than file level storage systems. Each block volume can be treated as an independent disk drive and controlled by external Server OS.



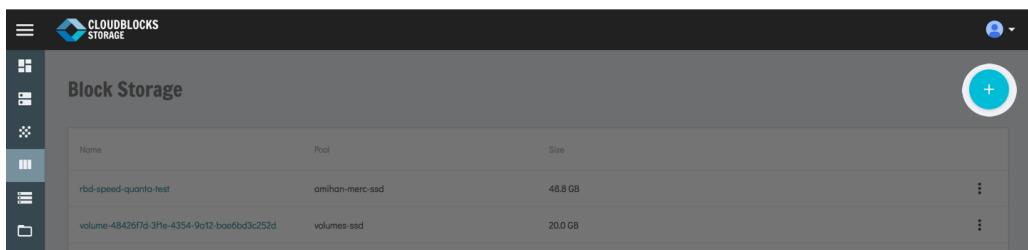
The screenshot shows the 'Block Storage' section of the CloudBlocks Storage interface. On the left is a sidebar with icons for Home, Block Storage, File Storage, Object Storage, and Help. The main area has a header 'Block Storage' with a '+' button. Below is a table with columns 'Name', 'Pool', and 'Size'. The data is as follows:

Name	Pool	Size
rbd-speed-quanta-test	amihan-merc-ssd	48.8 GB
volume-48426f7d-3f1e-4354-9a12-bae6bd3c252d	volumes-ssd	20.0 GB
volume-48426f7d-3f1e-4354-9a12-bae6bd3c252d	volumes-ssd	20.0 GB
volume-a5de6d59-5e25-419c-909a-0b0a070eabe8	volumes-ssd	10.0 GB
volume-c56fc5bc-7a46-4adf-a9b4-61fcbc0429d9	volumes-ssd	1.0 GB
kubernetes-dynamic-pvc-a8ce67f0-e8f4-11e6-8e84-...	amihan-mercury	1.0 GB
rbd-standard-quanta-test	amihan-mercury	48.8 GB
57d93e59-638d-43f9-93c3-455eedeafae	images	15.6 GB
57d93e59-638d-43f9-93c3-455eedeafae	images	15.6 GB
72750046-a0aa-431c-87a4-903044838b2e	images	12.7 MB

Create a Block Device

To create a block device, follow these steps:

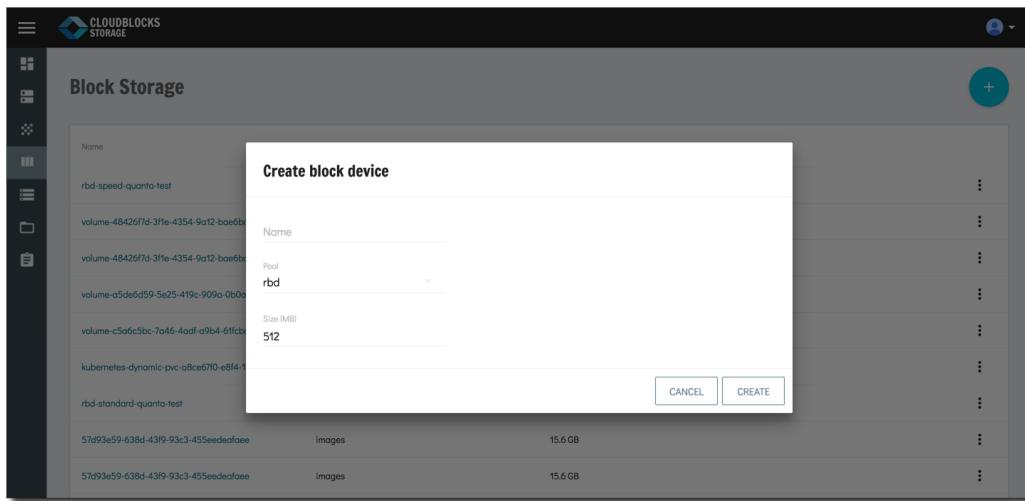
1. Click the create button on the upper right corner of the page. The *Create Block Device* window displays.



The screenshot shows the 'Block Storage' section of the CloudBlocks Storage interface. A modal window titled 'Create Block Device' is open in the center. The main area has a header 'Block Storage' with a '+' button. Below is a table with columns 'Name', 'Pool', and 'Size'. The data is as follows:

Name	Pool	Size
rbd-speed-quanta-test	amihan-merc-ssd	48.8 GB
volume-48426f7d-3f1e-4354-9a12-bae6bd3c252d	volumes-ssd	20.0 GB

- Enter the name of the block device, select a pool from the drop-down menu, and specify the size.

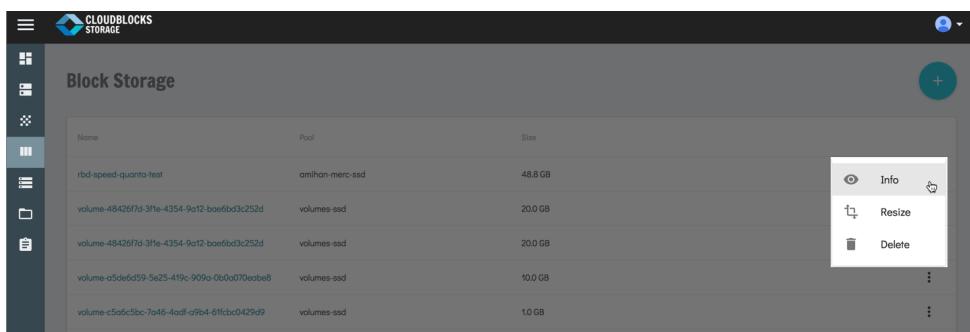


- Click **Create** to create the new block storage.

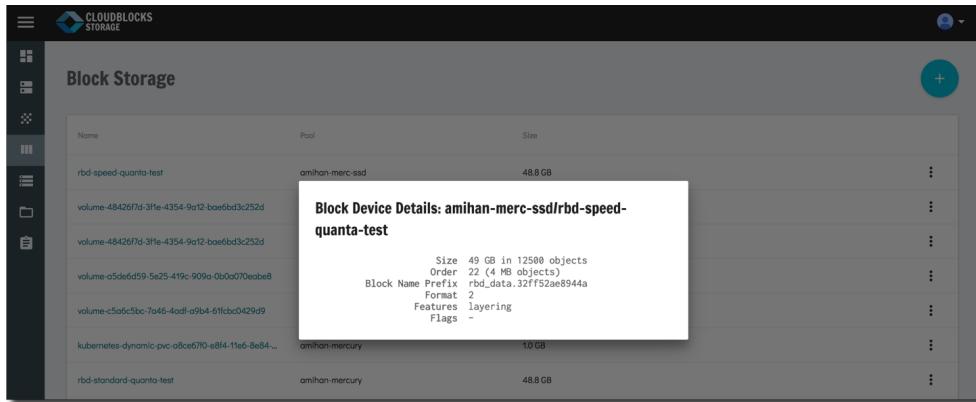
View Block Device Info

To view block info, follow the steps below.

- Select a block device from the list. Click the icon to the right and select **Info**.



- The *Block Device Details* window displays. You can close the window by clicking anywhere in the page.



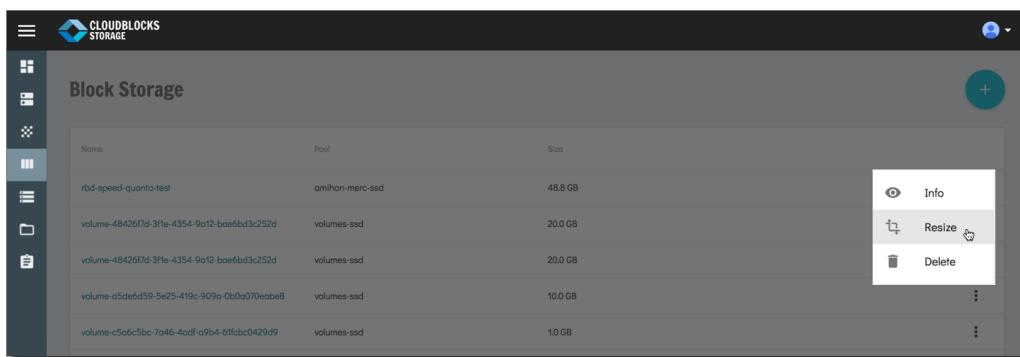
Block Device Details: amihan-merc-ssd/rbd-speed-quanta-test

- Size: 49 GB in 12500 objects
- Order: 22 (4 MB objects)
- Block Name Prefix: rbd_data.32ff52ae8944a
- Format:
- Features: layering
- Flags:

Resize a Block Device

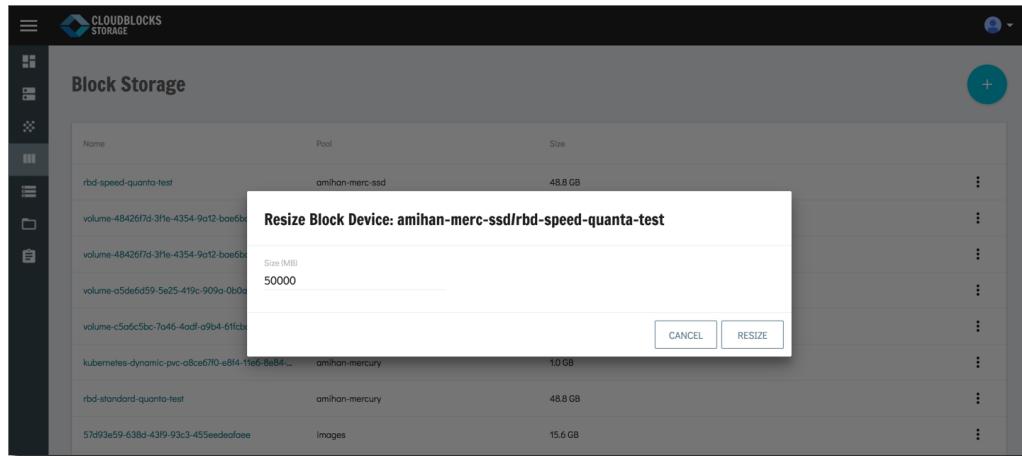
To resize a block device, follow these steps:

1. Click the icon to the right and select **Resize**. The *Resize Block Device* window displays.



2. Specify the new size of the device and click **Resize**.

Note: After resizing the Block Device it will also need to be resized in the mounted operating system in order to access the new space (`xfs_growfs` is one such tool for xfs filesystems).



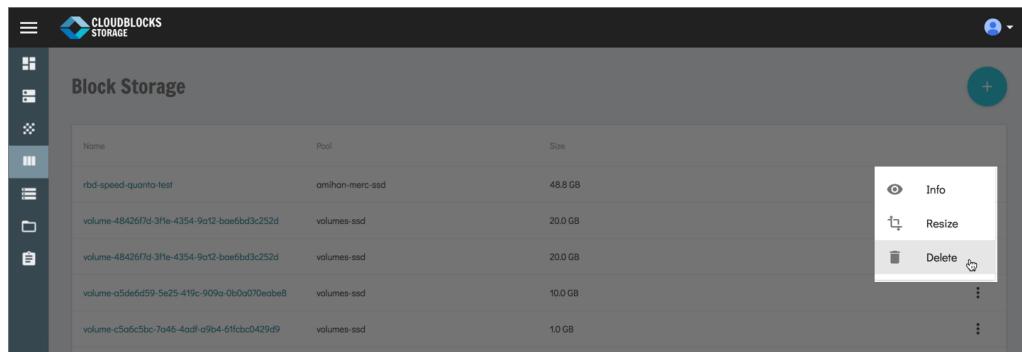
The screenshot shows the CloudBlocks Storage interface with the 'Block Storage' tab selected. A modal dialog titled 'Resize Block Device: amihan-merc-ssd/rbd-speed-quanta-test' is open. It contains a 'Size (MB)' input field with the value '50000'. At the bottom right of the dialog are 'CANCEL' and 'RESIZE' buttons.

Name	Pool	Size
rbd-speed-quanta-test	amihan-merc-ssd	48.8 GB
volume-48426f7d-3f1e-4354-9c12-bae6bd3c252d	volumes-ssd	20.0 GB
volume-48426f7d-3f1e-4354-9c12-bae6bd3c252d	volumes-ssd	20.0 GB
volume-a5de6d59-5e25-419c-909a-0b00a070eabe9	volumes-ssd	10.0 GB
rbd-standard-quanta-test	amihan-mercury	48.8 GB
57d93e59-638d-43f9-93c3-455eededface	images	15.6 GB

Delete a Block Device

To delete a block device, follow the steps below.

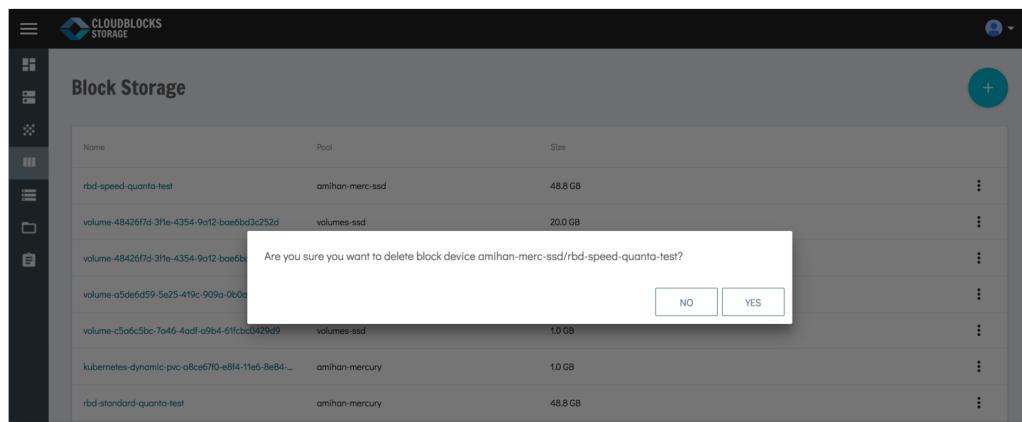
1. Click the icon to the right and select **Delete**. A confirmation window displays to confirm deletion.



The screenshot shows the CloudBlocks Storage interface with the 'Block Storage' tab selected. A context menu is open over a specific row in the table. The 'Delete' option is highlighted with a cursor icon. Other options in the menu are 'Info' and 'Resize'.

Name	Pool	Size
rbd-speed-quanta-test	amihan-merc-ssd	48.8 GB
volume-48426f7d-3f1e-4354-9c12-bae6bd3c252d	volumes-ssd	20.0 GB
volume-48426f7d-3f1e-4354-9c12-bae6bd3c252d	volumes-ssd	20.0 GB
volume-a5de6d59-5e25-419c-909a-0b00a070eabe9	volumes-ssd	10.0 GB
volume-c5af5c5bc-7a46-4ad1-a9b4-61fc0429d9	volumes-ssd	1.0 GB

2. Click **Yes** to confirm. Note that this action cannot be undone.



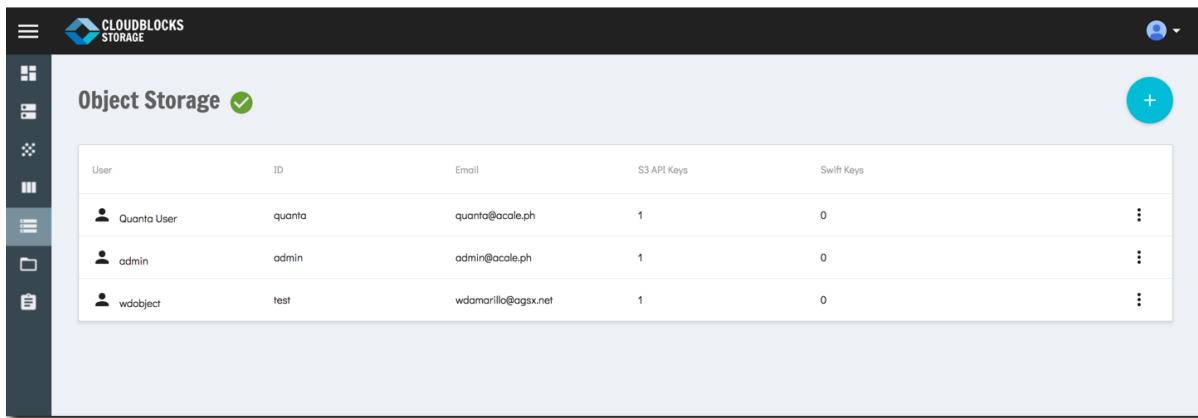
The screenshot shows the CloudBlocks Storage interface with the 'Block Storage' tab selected. A modal dialog is open, asking 'Are you sure you want to delete block device amihan-merc-ssd/rbd-speed-quanta-test?'. At the bottom right of the dialog are 'NO' and 'YES' buttons.

Name	Pool	Size
rbd-speed-quanta-test	amihan-merc-ssd	48.8 GB
volume-48426f7d-3f1e-4354-9c12-bae6bd3c252d	volumes-ssd	20.0 GB
volume-48426f7d-3f1e-4354-9c12-bae6bd3c252d	volumes-ssd	20.0 GB
volume-a5de6d59-5e25-419c-909a-0b00a070eabe9	volumes-ssd	10.0 GB
kubernetes-dynamic-pvc-08ce67f0-e8f4-11e6-8e84-...	amihan-mercury	1.0 GB
rbd-standard-quanta-test	amihan-mercury	48.8 GB

Object Storage

Object storage is vastly more scalable than traditional file system storage because it's vastly simpler. Instead of organizing files in a directory hierarchy, object storage systems store files in a flat organization of containers (called "buckets" in Amazon S3) and use unique IDs (called "keys" in S3) to retrieve them. The upshot is that object storage systems require less metadata than file systems to store and access files, and they reduce the overhead of managing file metadata by storing the metadata with the object. This means object storage can be scaled out almost endlessly by adding nodes.

The *Object Storage* page currently allows user management for access to the API but does not provide a UI to manage files in the object storage (that can be done by minio client, etc).

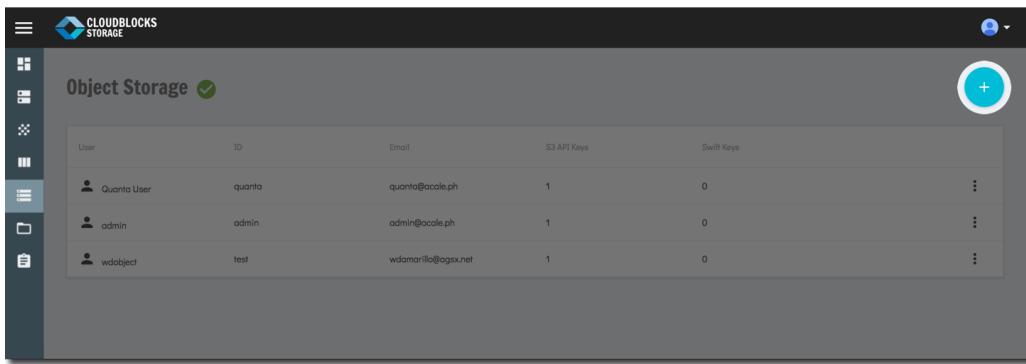


User	ID	Email	S3 API Keys	Swift Keys	
Quanta User	quanta	quanta@acale.ph	1	0	⋮
admin	admin	admin@acale.ph	1	0	⋮
wdobject	test	wdamarillo@gsx.net	1	0	⋮

Create an Object Storage User

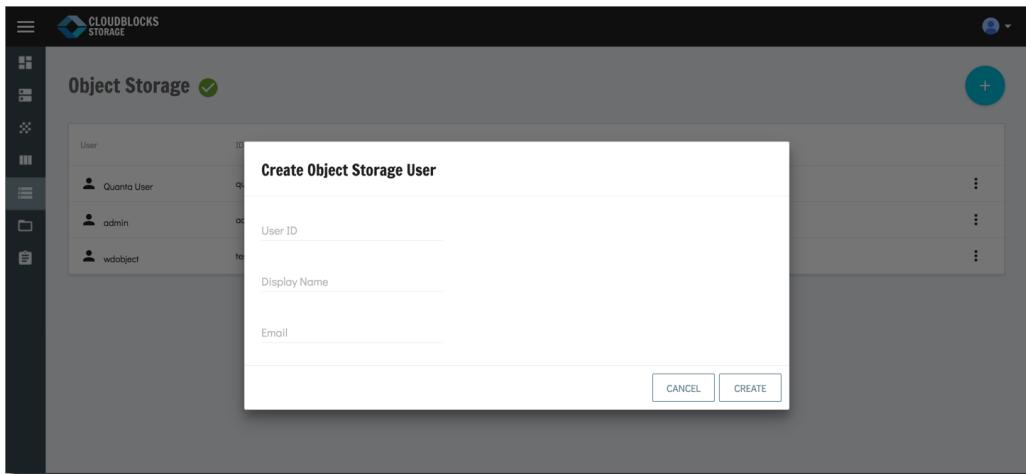
To create a object storage user, follow these steps:

1. Click the create button on the upper right corner of the page. The *Create Object Storage User* window displays.



The screenshot shows the CloudBlocks Storage interface with the 'Object Storage' tab selected. The list contains three users: 'Quanta User' (ID: quanta, Email: quanta@acale.ph), 'admin' (ID: admin, Email: admin@acale.ph), and 'wdobject' (ID: test, Email: wdmarille@ngsx.net). Each user has a row of three dots for more options. A large blue '+' button is located in the top right corner of the list area.

2. Enter the **User ID**, **Display Name**, and **Email** in the fields provided.



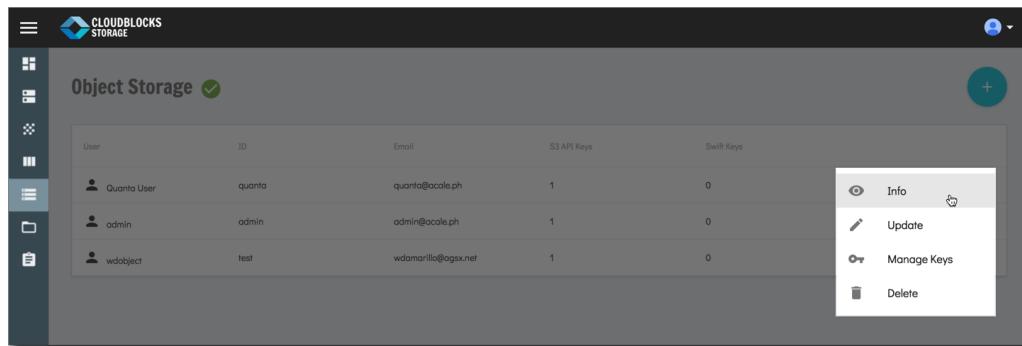
The screenshot shows the 'Create Object Storage User' dialog box. It has three input fields: 'User ID' (containing 'quanta'), 'Display Name' (containing 'Quanta User'), and 'Email' (containing 'quanta@acale.ph'). At the bottom are two buttons: 'CANCEL' and 'CREATE'.

3. Click **Create** to create the new object storage user.

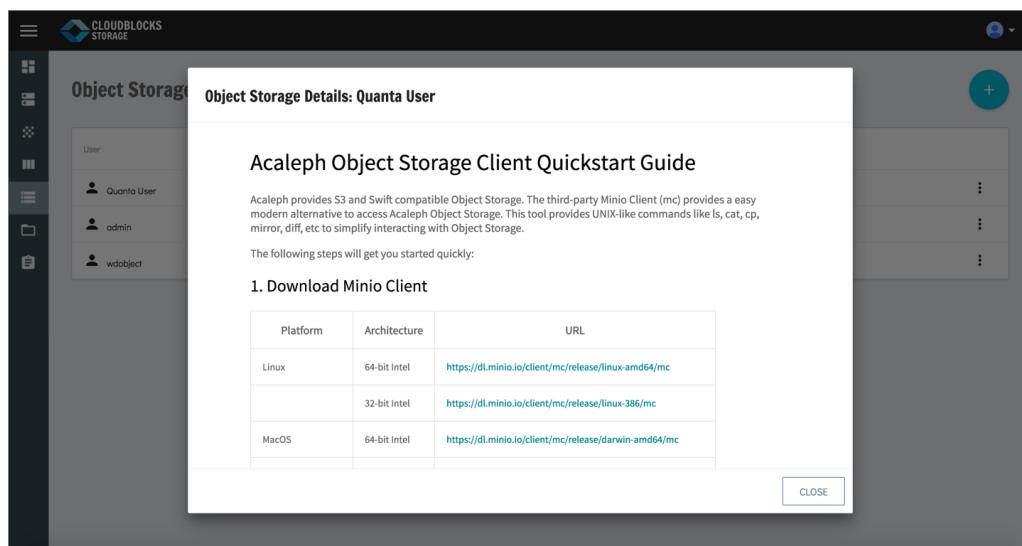
View Info

To view object storage info, follow the steps below.

1. Select an object storage user from the list.
2. Click the dotted icon to the right and select **Info**. The *Object Storage Details* window displays.



3. Scroll down to view all details of the selected user.

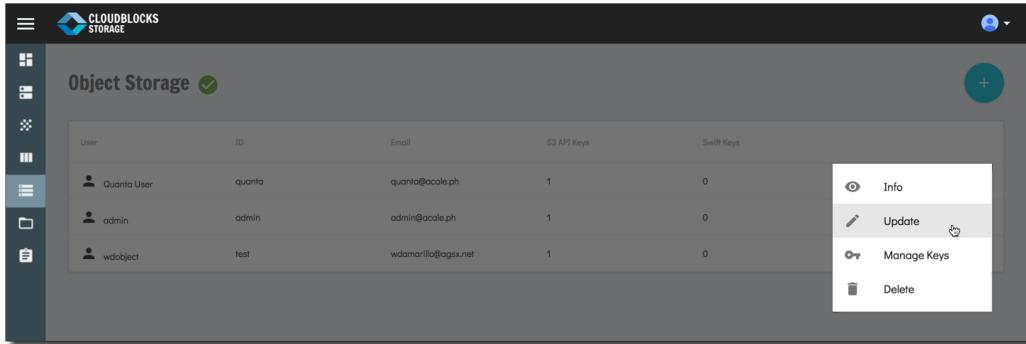


Platform	Architecture	URL
Linux	64-bit Intel	https://dl.minio.io/client/mc/release/linux-amd64/mc
	32-bit Intel	https://dl.minio.io/client/mc/release/linux-386/mc
MacOS	64-bit Intel	https://dl.minio.io/client/mc/release/darwin-amd64/mc

Update Object Storage User

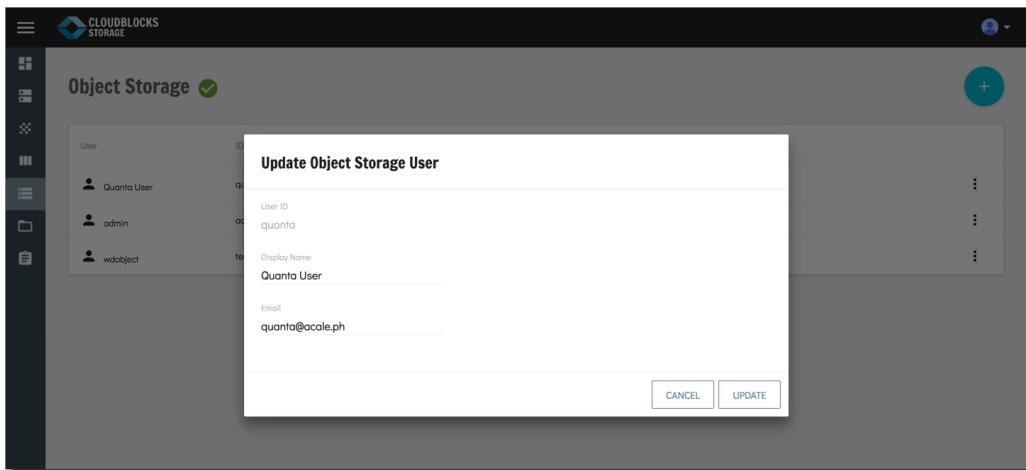
To update object storage user, follow these steps:

1. Select an object storage user from the list.
2. Click the dotted icon to the right and select **Update**. The *Update Object Storage User* window displays.



User	Email	S3 API Keys	Swift Keys
Quanta User	quanta@acale.ph	1	0
admin	admin@acale.ph	1	0
wdobject	wdamarillo@ogsx.net	1	0

3. Update the display name or email as needed. Note that the user ID cannot be changed.

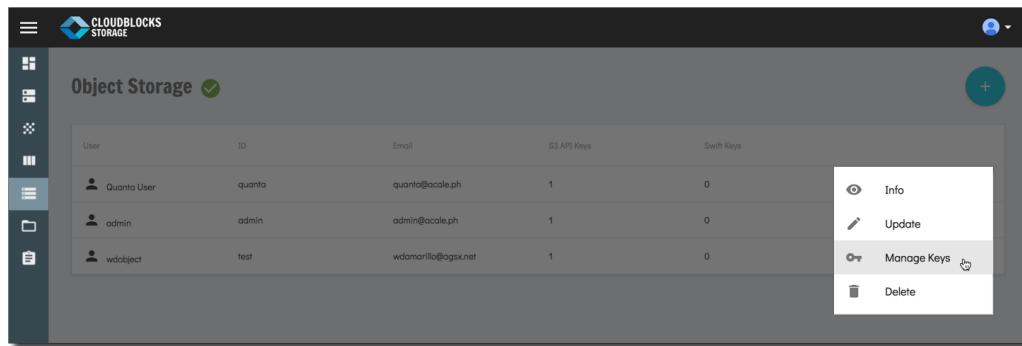


4. Click **Update** to save changes.

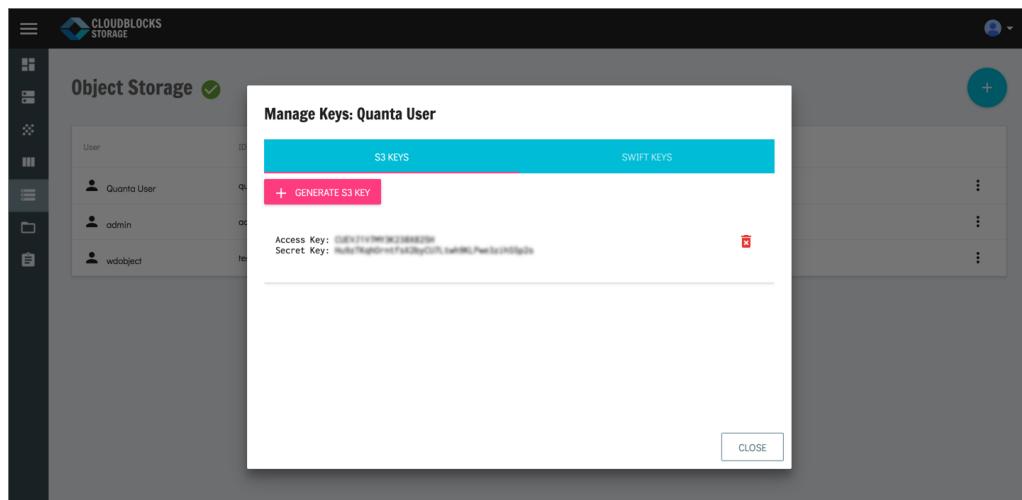
Manage Keys

To manage keys, follow these steps:

1. Select an object storage user from the list.
2. Click the icon to the right and select **Manage Keys**. The *Manage Keys* window displays.



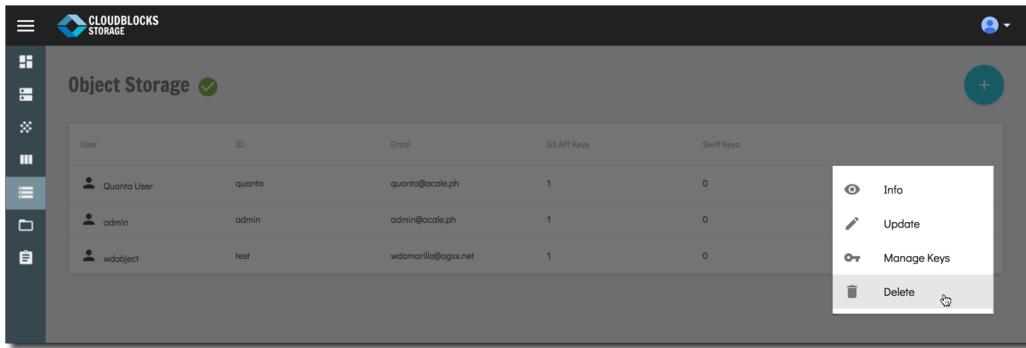
3. To generate S3 keys, click **Generate S3 Key**. To add Swift keys, go to *Swift Keys* tab and click **Add Swift Key**. Both keys are generated and added automatically to the list.



Delete an Object Storage User

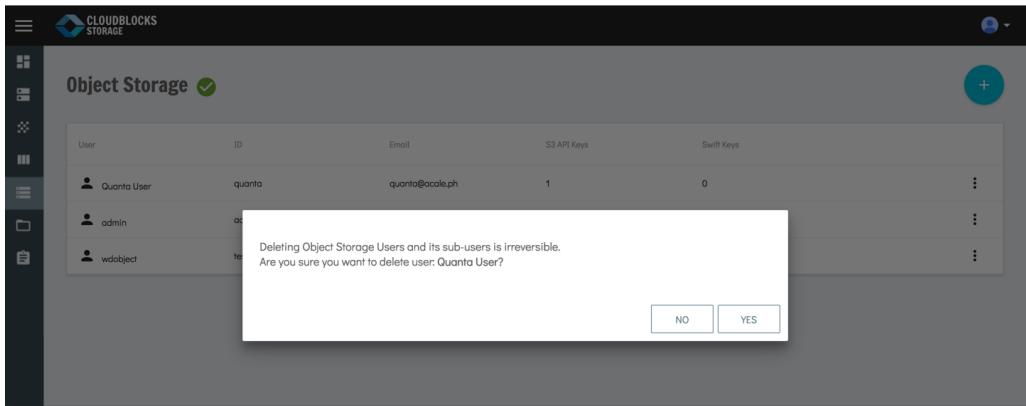
To delete an object storage user, follow the steps below.

1. Click the icon to the right and select **Delete**. A confirmation window displays to confirm deletion.



User	ID	Email	S3 API Keys	Swift Keys
Quanta User	quanta	quanta@acafe.ph	1	0
admin	admin	admin@acafe.ph	1	0
wdobject	test	wdamorillo@gsx.net	1	0

2. To confirm, click **Yes**. Note that this action cannot be undone.



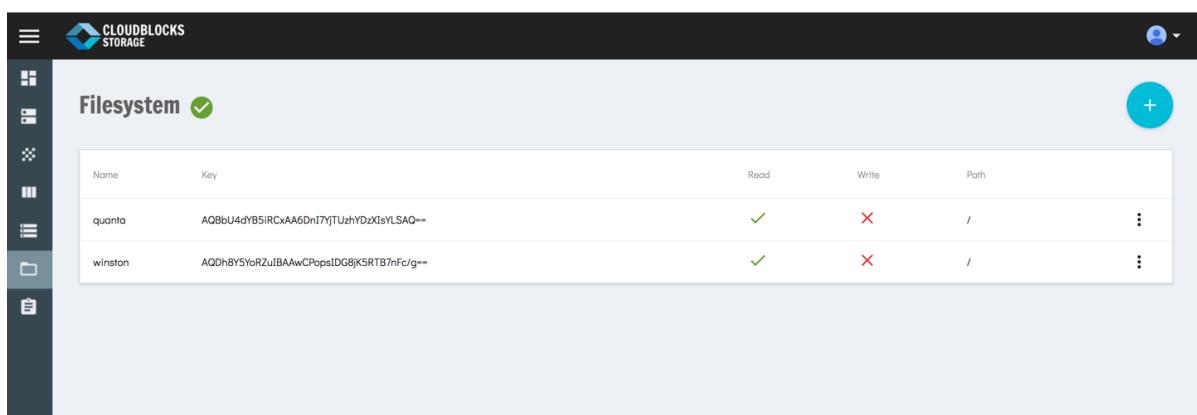
Deleting Object Storage Users and its sub-users is irreversible.
Are you sure you want to delete user: Quanta User?

NO YES

Filesystem

Ceph Filesystem is a posix compliant file system that uses ceph storage cluster to store its data. The Ceph metadata server cluster provides a service that maps the directories and filenames of the file system to objects stored within RADOS clusters. The metadata server cluster can expand or contract, and it can rebalance the file system dynamically to distribute data evenly among cluster hosts. This ensures high performance and prevents heavy loads on specific hosts within the cluster. This is similar to file sharing systems like NFS or CIFS.

The *Filesystem* page currently allows user management for access to the API but does not provide a UI to manage files.

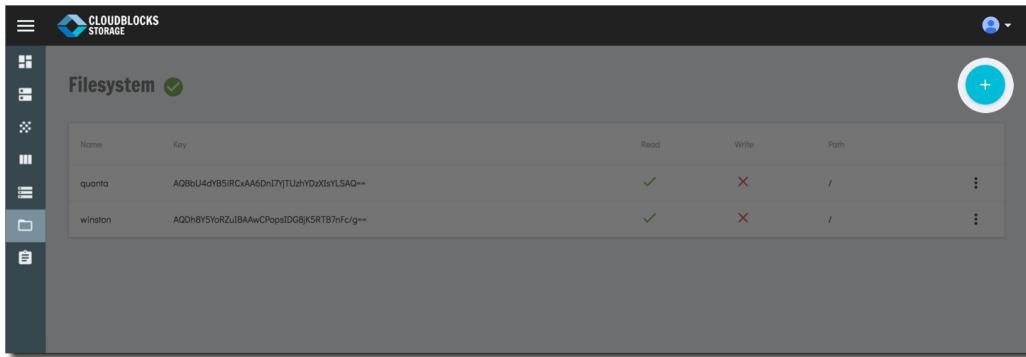


Name	Key	Read	Write	Path	⋮
quanta	AQBbU4dYB5jRCxAA6DnI7YTUzhYDzXlsYLSAQ==	✓	✗	/	⋮
winston	AQDh8Y5Y6RZjIBAAwCPopsIDG8jK5RTB7hFc/g==	✓	✗	/	⋮

Create a User

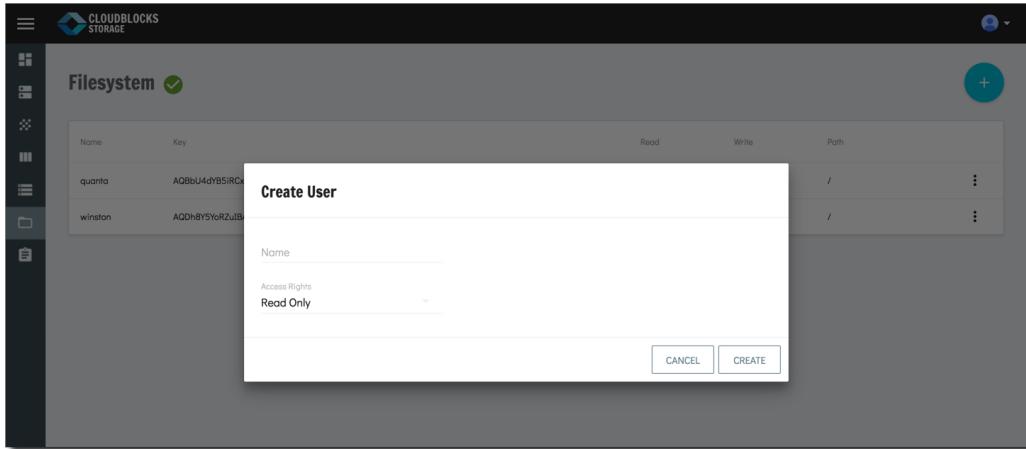
To create a user, follow the steps below.

1. Click the create button on the upper right corner of the page. The *Create User* window displays.



Name	Key	Read	Write	Path
quanta	AQ8bu4dYB5iRCxA6Dn17jTUshYDxIsYSAQ==	✓	✗	/
winston	AQDh8Y5yRZujBAAwCPopslDG8jK5RTB7nfC/g==	✓	✗	/

2. Enter the name of the user and specify access rights. Access rights can be *Read Only* or *Read and Write*.



Create User

Name: _____

Access Rights: **Read Only**

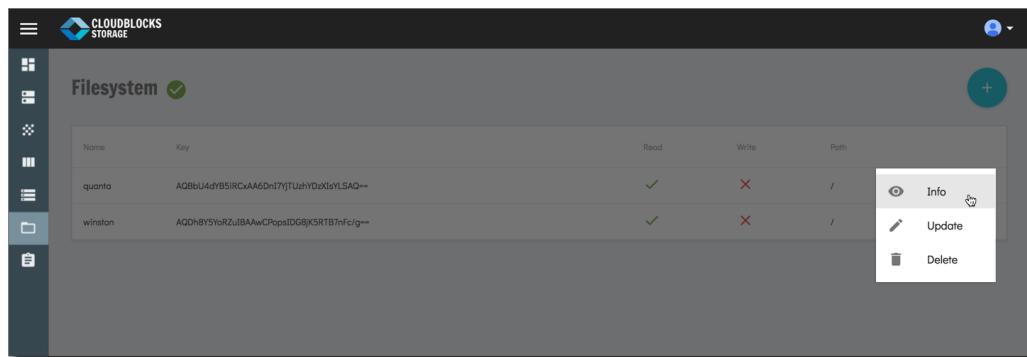
CANCEL **CREATE**

3. Click **Create** to create the user. Once created, the user will be displayed on the list.

View User Info

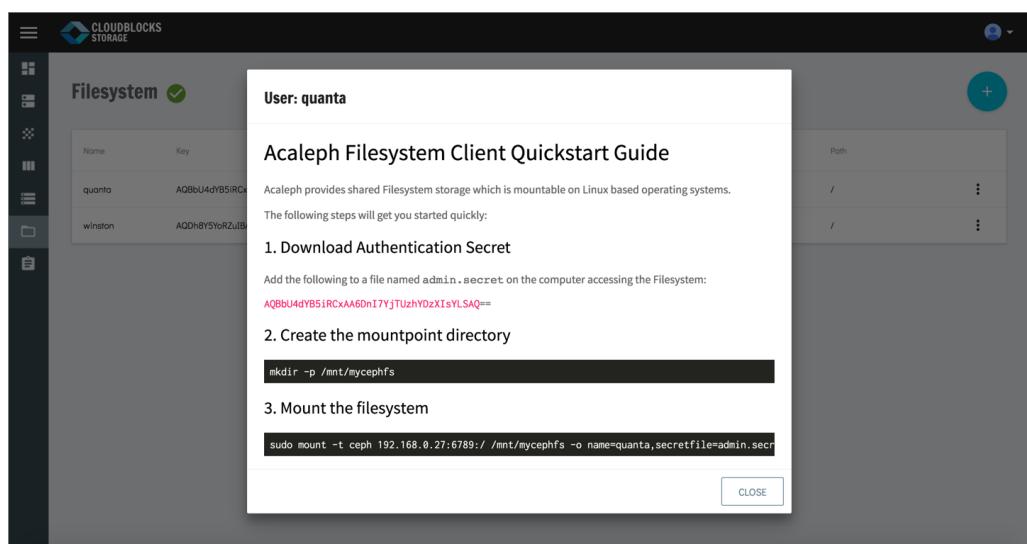
To view user info, follow these steps:

1. Select an object storage user from the list.
2. Click the icon to the right and select **Info**. The *User:<Name>* window displays.



Name	Key	Read	Write	Path
quanta	AQ8bu4dYB5IRCxA60nI7YjTUzHYdzXIsYLSAQ==	✓	✗	/
winston	AQDh8Y5tRZuIBAAwCPo8lDG8jKGRTB7nfFc/g==	✓	✗	/

3. Follow the steps outlined in the *Quickstart Guide*.



User: quanta

Acaleph Filesystem Client Quickstart Guide

Acaleph provides shared Filesystem storage which is mountable on Linux based operating systems. The following steps will get you started quickly:

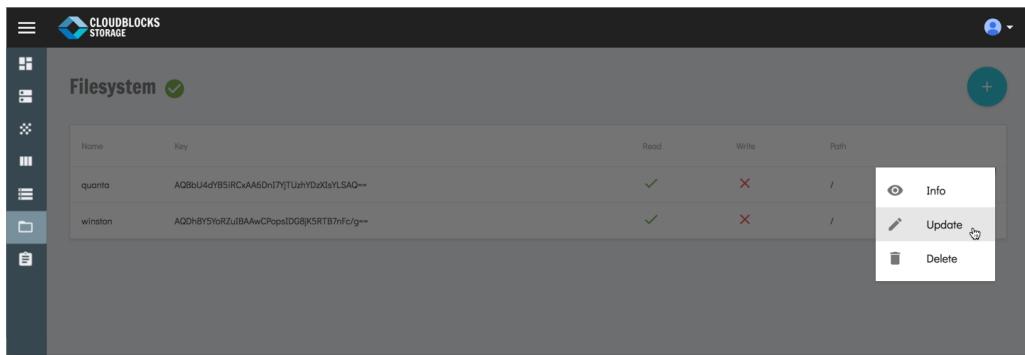
- 1. Download Authentication Secret**
Add the following to a file named `admin.secret` on the computer accessing the Filesystem:
`AQ8bu4dYB5IRCxA60nI7YjTUzHYdzXIsYLSAQ==`
- 2. Create the mountpoint directory**
`mkdir -p /mnt/mycephfs`
- 3. Mount the filesystem**
`sudo mount -t ceph 192.168.0.27:6789:/ /mnt/mycephfs -o name=quanta,secretfile=admin.secret`

CLOSE

Update User

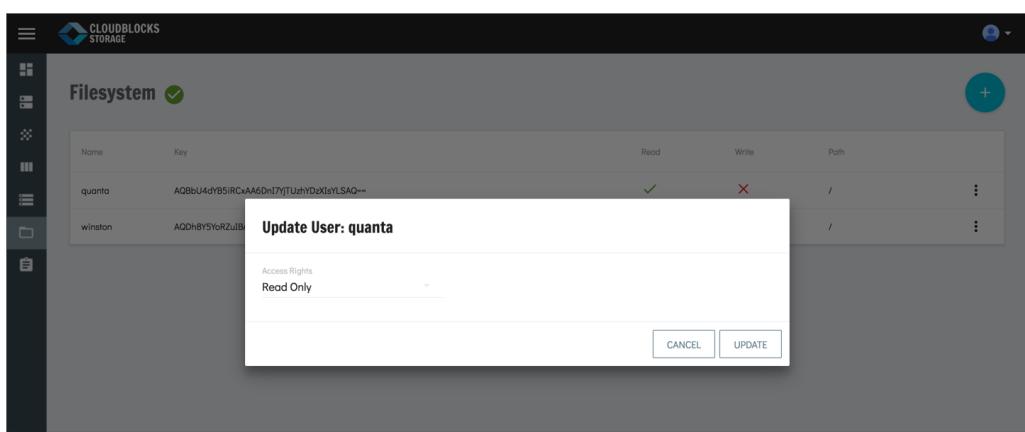
To update user, follow the steps below.

1. Select an object storage user from the list.
2. Click the icon to the right and select **Update**. The *Update User:<Name>* window displays.



Name	Key	Read	Write	Path
quanta	AQ8bU4dyB5iRCvAA6DnI7yjTUshYDx0sYSAQ==	✓	✗	/
winston	AQDh8Y5ycRzUiBIAwCPopadG8jKSRTB7nFc/g==	✓	✗	/

3. Change user access rights as needed and click **Update**.



Update User: quanta

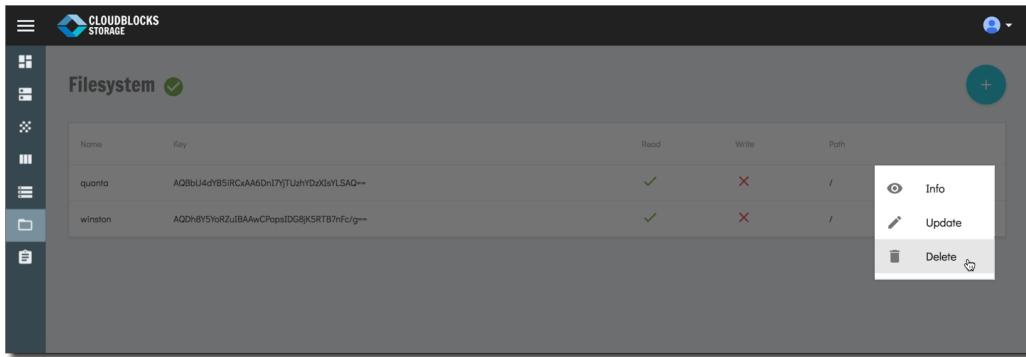
Access Rights
Read Only

CANCEL UPDATE

Delete User

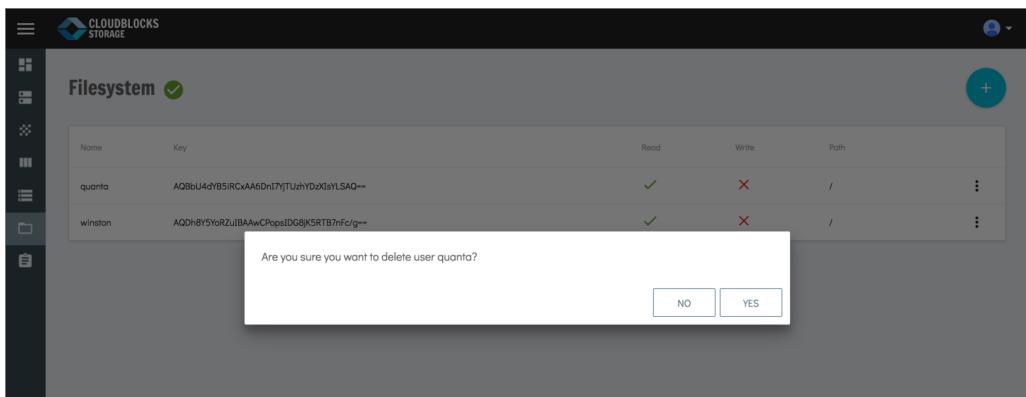
To delete user, follow these steps:

1. Click the icon to the right and select **Delete**. A confirmation window displays to confirm deletion.



Name	Key	Read	Write	Path
quanta	AQ8bu4dYB5IRCxAA6Dr17jTUzHyDxIsYSAQ==	✓	✗	/
winston	AQDh8Y5YoRZUjBAAwCpopsIDG8jKSRTB7nFc/g==	✓	✗	/

2. To confirm, click **Yes**. Note that this action cannot be undone.



Are you sure you want to delete user quanta?

Glossary

Buckets

A node in the CRUSH hierarchy, i.e. a location or a piece of physical hardware.

Ceph

A high performance open source distributed storage system. This provides:

- Block Storage (RBD)
- Object Storage (RadosGW)
- Filesystem (CephFS)

CephFS

Distributed POSIX compatible filesystem provided by Ceph. Similar to NFS or CIFS. Not production ready or offered by Acaleph.

Cluster Map

Contains data on the topology of a Ceph Cluster. There are 5 maps available – Monitor map, OSD map, PG map, MDS map and CRUSH map

CRUSH

Controlled Replication Under Scalable Hashing. It is the algorithm Ceph uses to compute object storage locations.

CRUSH Map

CRUSH maps contain a list of OSDs, a list of ‘buckets’ for aggregating the devices into physical locations, and a list of rules that tell CRUSH how it should replicate data in a Ceph cluster’s pools.

MDS

A Ceph service for CephFS metadata (unused in Acaleph)

Mon

A Ceph service that keep track of the allocation of Ceph objects, pools and cluster management. 1 per host and ideally in odd numbers (to make a quorum)

Object

The smallest unit of storage in Ceph. Large files will get broken into Objects and split across PGs.

Object Storage

Provides redundant, scalable distributed object storage using clusters of standardized servers. 'Distributed' means that each piece of the data is replicated across a cluster of storage nodes. The number of replicas is configurable, but should be set to at least three for production infrastructures. In general cloud terminology this can also refer to services such as S3, Swift or RADOS Gateway

OSD

A Ceph service that manages data storage on a single disk. Multiple OSDs may be run per host depending the number of disks.

Placement Group

Aggregates a series of objects into a group, and maps the group to a series of OSDs.

Pools

A logical partition for storing objects. This is called 'Partition' in the Acaleph Dashboard

RADOS Gateway

RADOS Gateway or RadosGW is an HTTP REST gateway for the RADOS object store, a part of the Ceph distributed storage system. Compatible with S3 and Swift APIs.

RBD

Rados Block Device – The block storage component of Ceph. Allows devices to be mounted by the operating system or used by Openstack. This is called 'Volume' in Acaleph Dashboard.

