Red Hat Ceph Storage 3.3 Release Notes

Release notes for Red Hat Ceph Storage 3.3
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Abstract

The Release Notes document describes the major features and enhancements implemented in Red Hat Ceph Storage in a particular release. The document also includes known issues and bug fixes.
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CHAPTER 1. INTRODUCTION

Red Hat Ceph Storage is a massively scalable, open, software-defined storage platform that combines the most stable version of the Ceph storage system with a Ceph management platform, deployment utilities, and support services.

The Red Hat Ceph Storage documentation is available at https://access.redhat.com/documentation/en/red-hat-ceph-storage/.
CHAPTER 2. ACKNOWLEDGMENTS

Red Hat Ceph Storage version 3.3 contains many contributions from the Red Hat Ceph Storage team. Additionally, the Ceph project is seeing amazing growth in the quality and quantity of contributions from individuals and organizations in the Ceph community. We would like to thank all members of the Red Hat Ceph Storage team, all of the individual contributors in the Ceph community, and additionally (but not limited to) the contributions from organizations such as:

- Intel
- Fujitsu
- UnitedStack
- Yahoo
- UbuntuKylin
- Mellanox
- CERN
- Deutsche Telekom
- Mirantis
- SanDisk
- SUSE
CHAPTER 3. NEW FEATURES

This section lists all major updates, enhancements, and new features introduced in this release of Red Hat Ceph Storage.

3.1. THE CEPH-ANSIBLE UTILITY

osd_auto_discovery now works with the batch subcommand

Previously, when osd_auto_discovery was activated, the batch subcommand did not create OSDs as expected. With this update, when batch is used with osd_auto_discovery, all the devices found by the ceph-ansible utility become OSDs and are passed in batch as expected.

Removing iSCSI targets using Ansible

Previously, the iSCSI targets had to be removed manually before purging the storage cluster. Starting with this release, the ceph-ansible playbooks remove the iSCSI targets as expected.

For bare-metal Ceph deployments, see the Removing the Configuration section in the the Red Hat Ceph Storage 3 Block Device Guide for more details.

For Ceph container deployment, see the Red Hat Ceph Storage 3 Container Guide for more details.

3.2. CEPH MANAGEMENT DASHBOARD

New options to use pre-downloaded container images

Previously, it was not possible to install Red Hat Ceph Storage Dashboard and the Prometheus plug-in without access to the Red Hat Container Registry. This update adds the following Ansible options that allow you to use pre-downloaded container images:

prometheus.pull_image

Set to false to not pull the Prometheus container image

prometheus.trust_image_content

Set to true to not contact the Registry for Prometheus container image verification

grafana.pull_image

Set to false to not pull the Dashboard container image

grafana.trust_image_content

Set to true to not contact the Registry for Dashboard container image verification

Set these options in the Ansible group_vars/all.yml file to use the pre-downloaded container images.

3.3. CEPH MANAGER PLUGINS

The RESTful plug-in now exposes performance counters

The RESTful plug-in for the Ceph Manager (ceph-mgr) now exposes performance counters that include a number of Ceph Object Gateway metrics. To query the performance counters through the REST API provided by the RESTful plug-in, access the /perf endpoint.

3.4. THE CEPH-VOLUME UTILITY
The ceph-volume tool can now set the sizing of journals and block.db

Previously, sizing for journals and block.db volumes could only be set in the ceph.conf file. With this update, the ceph-volume tool can set the sizing of journals and block.db. This exposes sizing right on the command line interface (CLI) so the user can use tools like ceph-ansible or the CLI directly to set or change sizing when creating an OSD.

New ceph-volume lvm zap options: --osd.id and --osd-fsid

The ceph-volume lvm zap command now supports the --osd.id and --osd-fsid options. Use these options to remove any devices for an OSD by providing its ID or FSID, respectively. This is especially useful if you are not aware of the actual device names or logical volumes in use by that OSD.

3.5. OBJECT GATEWAY

Beast.Asio is now fully supported

The Beast.Asio web server front end for the Object Store Gateway (RGW) is now GA and a fully supported option. This new RGW web server provides better IO performance and has lower resource requirements. These benefits are available to customers immediately without requiring any cluster hardware changes.

Note the enable experimental unrecoverable data corrupting features = rgw-beast-frontend warning is still needed.

To learn more about Beast, see the Using the "Beast front end" sections in the Object Gateway Guide for RHEL or the Object Gateway Guide for Ubuntu

Ability to search for users by access-key

This update adds the ability to search for users by the access-key as a search string when using the radosgw-admin utility:

```
radosgw-admin user info --access-key key
```

Ability to associate one email address to multiple user accounts

This update adds the ability to create multiple Ceph Object Gateway (RGW) user accounts with the same email address.

Keystone S3 credential caching has been implemented

The Keystone S3 credential caching feature permits using AWSv4 request signing (AWS_HMAC_SHA256) with Keystone as an authentication source, and accelerates Keystone authentication using S3. This also enables AWSv4 request signing, which increases client security.

3.6. PACKAGES

nfs-ganesha has been updated to the latest version

The nfs-ganesha package is now based on the upstream version 2.7.4, which provides a number of bug fixes and enhancements from the previous version.

3.7. RADOS

Updated the Ceph debug log to include the source IP address on failed incoming CRC
messages

Previously, when a failed incoming Cyclic Redundancy Check (CRC) message was getting logged into the Ceph debug log, only a warning about the failed incoming CRC message was logged. With this release, the source IP address is added to this warning message. This helps system administrators identify which clients and daemons might have some networking issues.

A new configuration option: osd_map_message_max_bytes

The monitoring function can sometimes send messages via the Ceph File system kernel client to the cluster which are too large, causing a traffic problem. A configuration option named osd_map_message_max_bytes was added with a default value of 10MiB. This allows the cluster to respond in a more timely manner.

The rocksdb_cache_size option default is now 512 MB

BlueStore OSD rocksdb_cache_size option default value has been changed to 512 MB to help with compaction.
CHAPTER 4. BUG FIXES

This section describes bugs with significant impact on users that were fixed in this release of Red Hat Ceph Storage. In addition, the section includes descriptions of fixed known issues found in previous versions.

4.1. THE CEPH-ANSIBLE UTILITY

The purge-cluster.yml playbook no longer causes issues with redeploying a cluster

Previously the purge-cluster.yml Ansible playbook did not clean all Red Hat Ceph Storage kernel threads as it should and could leave CephFS mountpoint mounted and Ceph Block Devices mapped. This could prevent redeploying a cluster. With this update, the purge-cluster.yml Ansible playbook cleans all Ceph kernel threads, unmounts all Ceph related mountpoint on client nodes, and unmaps Ceph Block Devices so the cluster can be redeployed.

(BZ#1337915)

The shrink-osd.yml playbook removes partitions from NVMe disks in all situations

Previously, the Ansible playbook infrastructure-playbooks/shrink-osd.yml did not properly remove partitions on NVMe devices when used with the osd_scenario: non-collocated option in containerized environments. This bug has been fixed with this update, and the playbook removes the partitions as expected.

(BZ#1572933)

Deploying NFS Ganesha gateway on Ubuntu IPv6 systems works as expected

When deploying NFS Ganesha gateway on Ubuntu IPv6 systems, the ceph-ansible utility failed to start the nfs-ganesha service. As a consequence, the installation process failed as well. This bug has been fixed, and the installation process proceeds as expected.

(BZ#1656908)

The rolling_update.yml playbook now restarts tcmu-runner and rbd-target-api

Previously, the iSCSI gateway infrastructure playbooks, specifically rolling_update.yml, only restarted the rbd-target-gw daemon. With this update, the playbook also restarts the tcmu-runner and rbd-target-api daemons so the updated versions of those daemons are used.

(BZ#1659611)

It is now possible to use Ansible playbooks without copying them to the root ceph-ansible directory

Due to the missing library variable in the Ansible configuration, the custom Ansible modules were not detected when executed playbooks were present in the infrastructure-playbooks directory. Consequently, it was not possible to run the infrastructure playbooks without copying them into the root ceph-ansible directory. This update adds the library variable to the Ansible configuration. As a result, it is possible to use playbooks in the infrastructure-playbooks without copying them, for example:

```bash
# ansible-playbook infrastructure-playbooks/purge-cluster.yml -i inventory_file
```

(BZ#1668478)
Using custom repositories to install Red Hat Ceph Storage

Previously, using custom software repositories to install Ceph was disabled. Having a custom software repository can be useful for environments where Internet access is not allowed. With this release, the ability to use custom software repositories are enabled for Red Hat signed packages only. Custom third-party software repositories are not supported.

(BZ#1673254)

Virtual IPv6 addresses are no longer configured for MON and RGW daemons

Previously, virtual IPv6 addresses could be configured in the Ceph configuration file for MON and RGW daemons because virtual IPv6 addresses are the first value present in the Ansible IPv6 address fact. The underlying code has been changed, and the last value in the Ansible IPv6 address fact is now used, and MON and RGW IPv6 configurations are set to the right value.

(BZ#1680155)

The BlueStore WAL and DB partitions are now only created when dedicated devices are specified for them

Previously, in containerized deployments using the non-collocated scenario, the BlueStore WAL partition was created by default on the same device as the BlueStore DB partition when it was not required. With this update, the bluestore_wal_devices variable is no longer set to dedicated_devices by default, and the BlueStore WAL partition is no longer created on the BlueStore DB device.

(BZ#1685253)

The shrink-osd.yml playbook stops OSD services as expected

A bug in the shrink-osd.yml playbook caused the stopping osd service task to attempt to connect to an incorrect node. Consequently, the task could not stop the OSD services properly. With this update, the bug has been fixed, and the playbook delegates the task on the correct node. As a result, OSD services are stopped properly.

(BZ#1686306)

An increase to the CPU allocation for containerized Ceph MDS deployments

Previously, for container-based deployments, the CPU allocation for the Ceph MDS daemons was set to 1 as the default. In some scenarios, this caused slow performance when compared to a bare-metal deployment. With this release, the Ceph MDS daemon CPU allocation default is 4.

(BZ#1695850)

Faster OSD creation when deploying on containers

Previously, when creating an OSD in a container using the lvm OSD scenario, the container was allowed to set the number of open files to a value higher than the default host value. This behavior caused slower ceph-volume performance when compared to running ceph-volume on bare metal. With this release, the maximum number of open files is set to a lower value (1024) on the container during OSD creation. This results in faster OSD creation in container-based deployment.

(BZ#1702285)

The group_vars files now correctly refer to RHCS 3.x instead of 2.x

Previously, the Red Hat Ceph Storage (RHCS) documentation URL and default value were referring to RHCS 2.x instead of 3.x. This meant deploying with the default value on baremetal using the CDN
repositories would configure RHCS 2.x repositories instead of 3.x. The documentation in the configuration files were also referring to 2.x. With this update, the default RHCS version value and URL are now referring to RHCS 3, and there are no 2.x references.

(BZ#1702732)

The purge-cluster.yml playbook no longer fails when initiated a second time

The purge-cluster.yml playbook would fail if the ceph-volume binary was not present. Now the presence of the ceph-volume binary is checked, allowing for the purge-cluster.yml playbook to be initiated multiple times successfully.

(BZ#1722663)

4.2. CEPH MANAGEMENT DASHBOARD

The MDS Performance dashboard now displays the correct number of CephFS clients

The MDS Performance dashboard displayed an incorrect value for Clients after increasing and decreasing the number of active Metadata Servers (MDS) and clients multiple times. This bug has been fixed, and the MDS Performance dashboard now displays the correct number of Ceph File System (CephFS) clients as expected.

(BZ#1652896)

The TCP port for the Ceph exporter is opened during the Ansible deployment of the Ceph Dashboard

Previously, the TCP port for the Ceph exporter was not opened by the Ansible deployment scripts on all the nodes in the storage cluster. Opening TCP port 9283 had to be done manually on all nodes for the metrics to be available to the Ceph Dashboard. With this release, the TCP port is now being opened by the Ansible deployment scripts for Ceph Dashboard.

(BZ#1677269)

4.3. CEPH FILE SYSTEM

The drop cache command completes as expected

Previously, when executing the administrative drop cache command, the Metadata Server (MDS) did not detect that the clients could not return more capabilities, and the command would not complete. With this update, the MDS now detects the clients cannot return any more capabilities, and the command completes.

(BZ#1685734)

Heartbeat packets are reset as expected

Previously, the Ceph Metadata Server (MDS) did not reset heartbeat packets when it was busy in a large loops. This prevented the MDS from sending a beacon to the Monitor. With this update, the Monitor replaces the busy MDS, and the heartbeat packets are reset when the MDS is busy in a large loop.

(BZ#1714810)

The MDS no longer tries many log segments after restart
Previously, the Ceph Metadata Server (MDS) would sometimes try many log segments after restart. The MDS would then send too many OSD requests in a short period of time which could harm the Ceph cluster. This update limits the number of log segments, and the cluster is no longer harmed.

(BZ#1714814)

An issue with the _lookup_parent() function no longer causes nfs-ganesha to fail

Under certain circumstances, the _lookup_parent() function in the Red Hat Ceph Storage userland client libraries could return 0, but not zero out the parent return pointer, which would remain uninitialized. Later, an assertion that the parent pointer be NULL would trip, and cause nfs-ganesha to fail. With this update, the error checking and return of _lookup_parent() has been refactored, and the situation is avoided.

(BZ#1715086)

Partially flushed ESessions log event no longer cause the MDS to fail

Previously, when a Ceph Metadata Server (MDS) had more than 1024 client sessions, sessions in the ESessions log event could get flushed partially. The journal replay code expects sessions in the ESessions log event to either be all flushed or not flushed at all, so this would cause the MDS to fail. With this update, the journal replay code can handle a partially flushed ESessions log event.

(BZ#1718135)

4.4. THE CEPH-VOLUME UTILITY

ceph-volume now returns a more accurate error message when deploying OSDs on devices with GPT headers

The ceph-volume utility does not support deploying OSDs on devices with GUID Partition Table (GPT) headers. Previously, after attempting to do so, an error similar to the following one was returned:

```
Device /dev/sdb excluded by a filter
```

With this update, the ceph-volume utility returns a more accurate error message instructing the users to remove GPT headers:

```
GPT headers found, they must be removed on: $device_name
```

(BZ#1644321)

ceph-volume can determine if a device is rotational or not even if the device is not in the /sys/block/ directory

If the device name did not exist in the /sys/block/ directory, the ceph-volume utility could not acquire information on if a device was rotational or not. This was for example the case for loopback devices or devices listed in the /dev/disk/by-path/ directory. Consequently, the lvm batch subcommand failed. With this update, ceph-volume uses the lsblk command to determine if a device is rotational if no information is found in /sys/block/ for the given device. As a result, lvm batch works as expected in this case.

(BZ#1666822)

4.5. ISCSI GATEWAY
The **rbd-target-api** service is started and stopped with respect to the **rbd-target-gw** service status

Previously, the **rbd-target-api** service did not start after starting the **rbd-target-gw** service. Consequently, the **rolling_update.yml** playbook stopped at **TASK [stop ceph iscsi services]**, and the updating process did not continue. With this update, the **rbd-target-api** service is started and stopped with respect to the **rbd-target-gw** service status, and the updating process works as expected.

*(BZ#1670785)*

**4.6. OBJECT GATEWAY**

Bucket resharding status is now displayed in plain language

Previously, the **radosgw-admin reshard status --bucket bucket_name** command used identifier-like tokens as follows to display the resharding status of a bucket:

- **CLS_RGW_RESHARD_NONE**
- **CLS_RGW_RESHARD_IN_PROGRESS**
- **CLS_RGW_RESHARD_DONE**

With this update, the command uses plain language to display the status:

- not-resharding
- in-progress
- done

*(BZ#1639712)*

**Swift object expiration is no longer effected by resharding**

The Swift object expiration code was not compatible with bucket index resharding. This behavior could stall object expiration for the buckets. The Swift object expiration code has been updated to identify buckets using a tenant and bucket name. This update allows the removal of expired objects from an already resharded and stalled bucket. As a result, the object expiration is no longer effected by bucket index resharding.

*(BZ#1703557)*

**Getting the versioning state on a nonexistent bucket now returns an error**

Previously, when getting the bucket version on a nonexistent bucket, the HTTP response was successful, for example:

**'HTTPStatusCode': 200**

Because the bucket does not exist, the correct HTTP response must be an error. With this release, when getting the bucket version on a nonexistent bucket, the Ceph Object Gateway code returns the following error:

**ERR_NO_SUCH_BUCKET**

*(BZ#1705922)*
Enabling the `rgw_enable_ops_log` option would result in unbound memory growth

Previously, there was no process for consuming log entries, which lead to unbound memory growth for the Ceph Object Gateway. With this release, the process discards new messages when the number of outstanding messages in the data buffer exceeds a threshold, resulting in a smaller memory footprint.

*(BZ#1708346)*

Large or changed directories are now handled properly

Due to several underlying problems in the Ceph Object Gateway, the listing of very large directories could fail, and changed directories could become stale. With this update, the underlying problems have been fixed, allowing listing of large directories without failures, and reliable expiration of cached directory contents. Additionally, for the RADOS Gateway NFS interface, further changes were made allowing large directories to be listed at least 10 times faster than in Red Hat Ceph Storage 2.x.

*(BZ#1708587)*

A new bucket life-cycle policy will overwrite the existing life-cycle policy

Because of an encoding error with the Ceph Object Gateway, storing a new bucket life-cycle policy on a bucket that already had an existing one would fail. Previously, working around the failure was done by deleting the old policy first, before storing the new one. With this release, this encoding error was fixed.

*(BZ#1708650)*

Space is no longer leaked when deleting objects via NFS

Previously, the Ceph Object Gateway NFS implementation incorrectly set a value used to construct a key subsequently used to set garbage collection (GC) on shadow objects. Deleting an object via NFS, as opposed to S3 or Swift, could cause space to be leaked. With this update, the GC tag is now set correctly and space is not leaked when deleting objects via NFS.

*(BZ#1715946)*

A performance decrease when listing buckets with large object counts due to a regression was resolved

RADOS Gateway introduced a performance regression as a byproduct of changes in Red Hat Ceph Storage 3.2z2, which added support for multicharacter delimiters. This could cause S3 clients to time out. The regression has been fixed, restoring the original performance when listing buckets with large object counts. S3 clients no longer time out due to this issue.

*(BZ#1717135)*

The S3 client no longer times out when listing buckets with millions of objects

Previously, a change to the behavior of ordered bucket listing allowed support for multi-character delimiter searching, but this change did not include important listing optimizations. This caused a large performance loss. With this release, the logic controlling delimiter handling has been optimized, resulting in better performance.

*(BZ#1718328)*

Multi-character delimiter searches now take an expected amount of time to complete

Sometimes multi-character delimiter searches took an excessive amount of time. The logic has been corrected and now searches take an expected amount of time.
BZ#1720741

The clean-up process no longer fails after an aborted upload

When a multipart upload was aborted part way through, the clean-up process assumed some artifacts were present. If they were not present, it caused an error and the clean-up process stopped. The logic has been updated so if the artifacts are not present, the clean-up process still continues until it finishes.

BZ#1722664

The RADOS configuration URL is now able to read objects larger than 1000 bytes

The RADOS configuration URL was unable to read configuration objects greater than 1000 bytes because they were truncated. This behavior has been fixed and now larger objects are read properly.

BZ#1725521

4.7. OBJECT GATEWAY MULTISITE

radosgw-admin bucket rm --bypass-gc now stores timestamps for deletions

Previously, objects deleted with radosgw-admin bucket rm --bypass-gc did not store a timestamp for the deletion. Because of this, data sync did not apply these object deletions on other zones. With this update, proper timestamps are stored for deletions, and bucket rm with --bypass-gc correctly deletes objects on all zones.

BZ#1599852

Bucket creation time remains consistent between zones in a multisite environment

Previously, a metadata sync in a multisite environment did not always update bucket creation time, and bucket creation times could become inconsistent between zones. With this update, the metadata sync now updates creation time even if the bucket already exists, and bucket creation time remains consistent between zones.

BZ#1702288

The radosgw-admin bilog trim command now fully trims the bucket index log

Previously, the radosgw-admin bilog trim command only trimmed 1000 entries from the log, because only one OSD request was sent. With this release, the radosgw-admin bilog trim command now sends OSD requests in a loop until the bucket index log is completely trimmed.

BZ#1713779

4.8. RADOS

ceph osd in any no longer marks permanently removed OSDs as in

Previously, running the ceph osd in any command on a Red Hat Ceph Storage cluster marked all historic OSDs that were once part of the cluster as in. With this update, ceph osd in any no longer marks permanently removed OSDs as in.

BZ#1696691

The Ceph Balancer now works with erasure-coded pools

The maybe_remove_pg_upmaps method is meant to cancel invalid placement group items done by
the upmap balancer, but this method incorrectly canceled valid placement group items when using erasure-coded pools. This caused a utilization imbalance on the OSDs. With this release, the maybe_remove_pg_upmaps method is less aggressive and does not invalidate valid placement group items, and as a result, the upmap balancer works with erasure-coded pools.

(BZ#1715577)
CHAPTER 5. TECHNOLOGY PREVIEWS

This section provides an overview of Technology Preview features introduced or updated in this release of Red Hat Ceph Storage.

**IMPORTANT**

Technology Preview features are not supported with Red Hat production service level agreements (SLAs), might not be functionally complete, and Red Hat does not recommend to use them for production. These features provide early access to upcoming product features, enabling customers to test functionality and provide feedback during the development process.

For more information on Red Hat Technology Preview features support scope, see https://access.redhat.com/support/offerings/techpreview/.

5.1. BLOCK DEVICES (RBD)

Erasure Coding for Ceph Block Devices

Erasure coding for Ceph Block Devices is supported as a Technology Preview. For details, see the Erasure Coding with Overwrites (Technology Preview) section in the Storage Strategies Guide for Red Hat Ceph Storage 3.

5.2. CEPH FILE SYSTEM

Erasure Coding for Ceph File System

Erasure coding for Ceph File System is now supported as a Technology Preview. For details, see the Creating Ceph File Systems with erasure coding section in the Ceph File System Guide for Red Hat Ceph Storage 3.

5.3. OBJECT GATEWAY

Improved interoperability with S3 and Swift by using a unified tenant namespace

This enhancement allows buckets to be moved between tenants. It also allows buckets to be renamed.

In Red Hat Ceph Storage 2 the `rgw_keystoneImplicitTenants` option only applied to Swift. As of Red Hat Ceph Storage 3 this option applies to s3 also. Sites that used this feature with Red Hat Ceph Storage 2 now have outstanding data that depends on the old behavior. To accommodate that issue this enhancement also expands `rgw_keystoneImplicitTenants` so it can be set to any of "none", "all", "s3", or "swift".

For more information, see Bucket management in the Object Gateway Guide for Red Hat Enterprise Linux or Object Gateway Guide for Ubuntu depending on your distribution. The `rgw_keystoneImplicitTenants` setting is documented in the Using Keystone to Authenticate Ceph Object Gateway Users guide.

Ceph Object Gateway now supports Elasticsearch 5 and 6 APIs as a Technology Preview feature

Support has been added for using the Elasticsearch 5 and 6 application programming interfaces (APIs) with the Ceph Object Gateway.
CHAPTER 6. KNOWN ISSUES

This section documents known issues found in this release of Red Hat Ceph Storage.

6.1. CEPH MANAGEMENT DASHBOARD

The dashboard shows no data while the cluster is updating

Due to a known issue, the Red Hat Ceph Storage dashboard does not show any data while the cluster is updating.

(BZ#1731330)

The dashboard can not be configured in a containerized cluster

In a containerized Ceph environment, the Red Hat Ceph Storage dashboard fails because the cephmetric-ansible playbook fails to populate the container name.

(BZ#1731919)

6.2. OBJECT GATEWAY

Ceph Object Gateway can terminate

The Ceph Object Gateway with Beast frontend terminates with an uncaught exception if there are many open file descriptors.

(BZ#1740668)

6.3. OBJECT GATEWAY MULTISITE

Invalid bucket names

There are some S3 bucket names that are invalid in AWS, and therefor cannot be replicated by the Ceph Object Gateway multisite. For more information about these bucket names, see the AWS documentation.

(BZ#1724106)
CHAPTER 7. DEPRECATED FUNCTIONALITY

This section provides an overview of functionality that has been deprecated in all minor releases up to this release of Red Hat Ceph Storage.

7.1. THE CEPH-ANSIBLE UTILITY

The `rgw_dns_name` parameter

The `rgw_dns_name` parameter is deprecated. Instead, configure the RADOS Gateway (RGW) zonegroup with the RGW DNS name. For more information, see: Ceph - How to add hostnames in RGW zonegroup in the Red Hat Customer Portal.
CHAPTER 8. SOURCES

The updated Red Hat Ceph Storage source code packages are available at the following locations:

- For Ubuntu: https://rhcs.download.redhat.com/ubuntu/