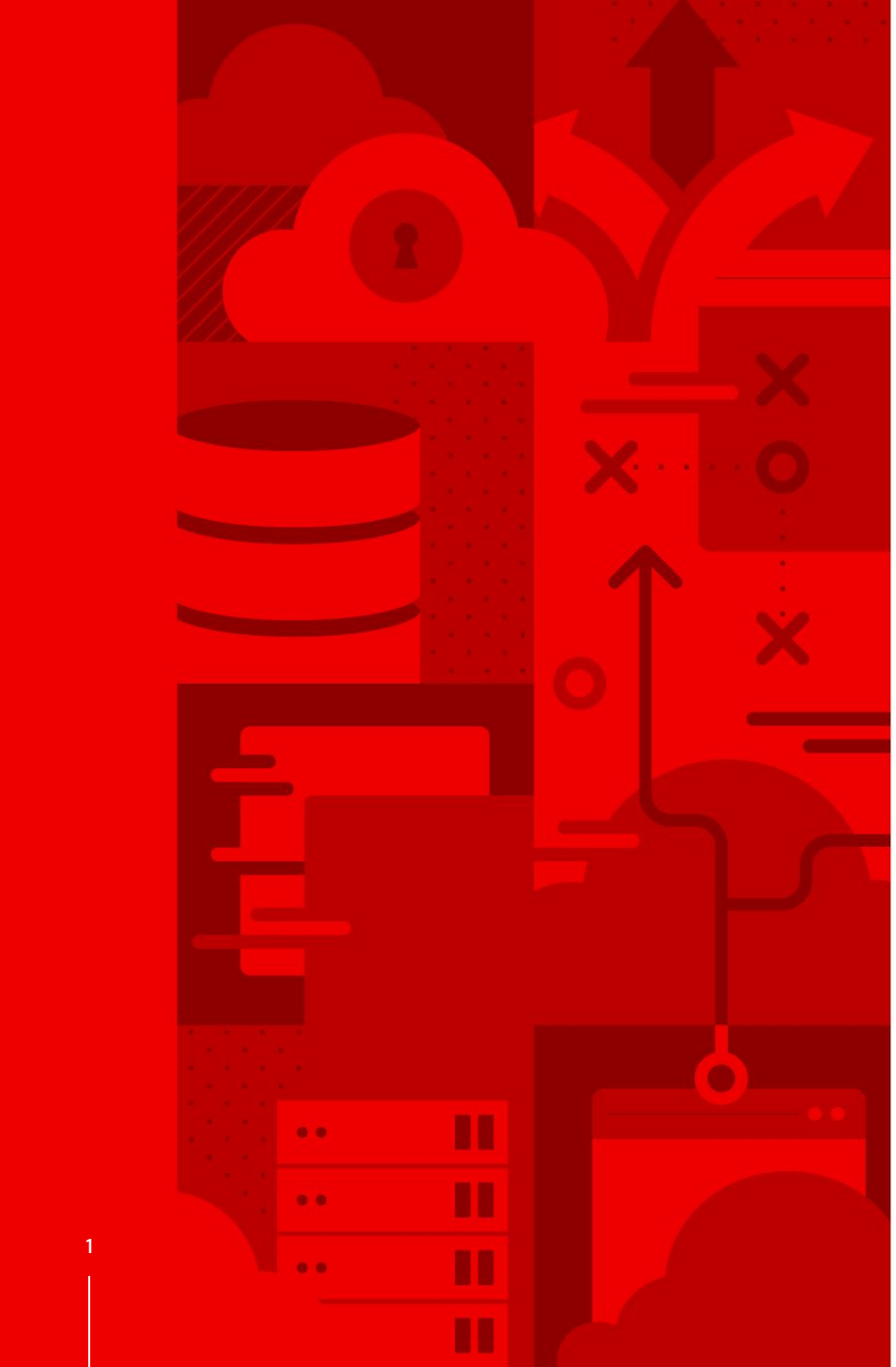


Red Hat
OpenStack Platform

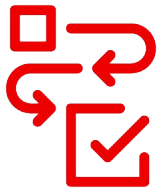
Cinder and Glance Overview and Update

Ask Me Anything!

Brian Rosmaita
Senior Software Engineer

Red Hat

What we'll discuss today



- OpenStack
- OpenStack development
- Red Hat OSP
- Sausage making
- Glance
- Cinder
- Cinder drivers
- OpenShift
- cinder-csi
- ember-csi
- AMA

Why should you care about Cinder and Glance?

Cinder and Glance

... are core components of OpenStack

Openstack

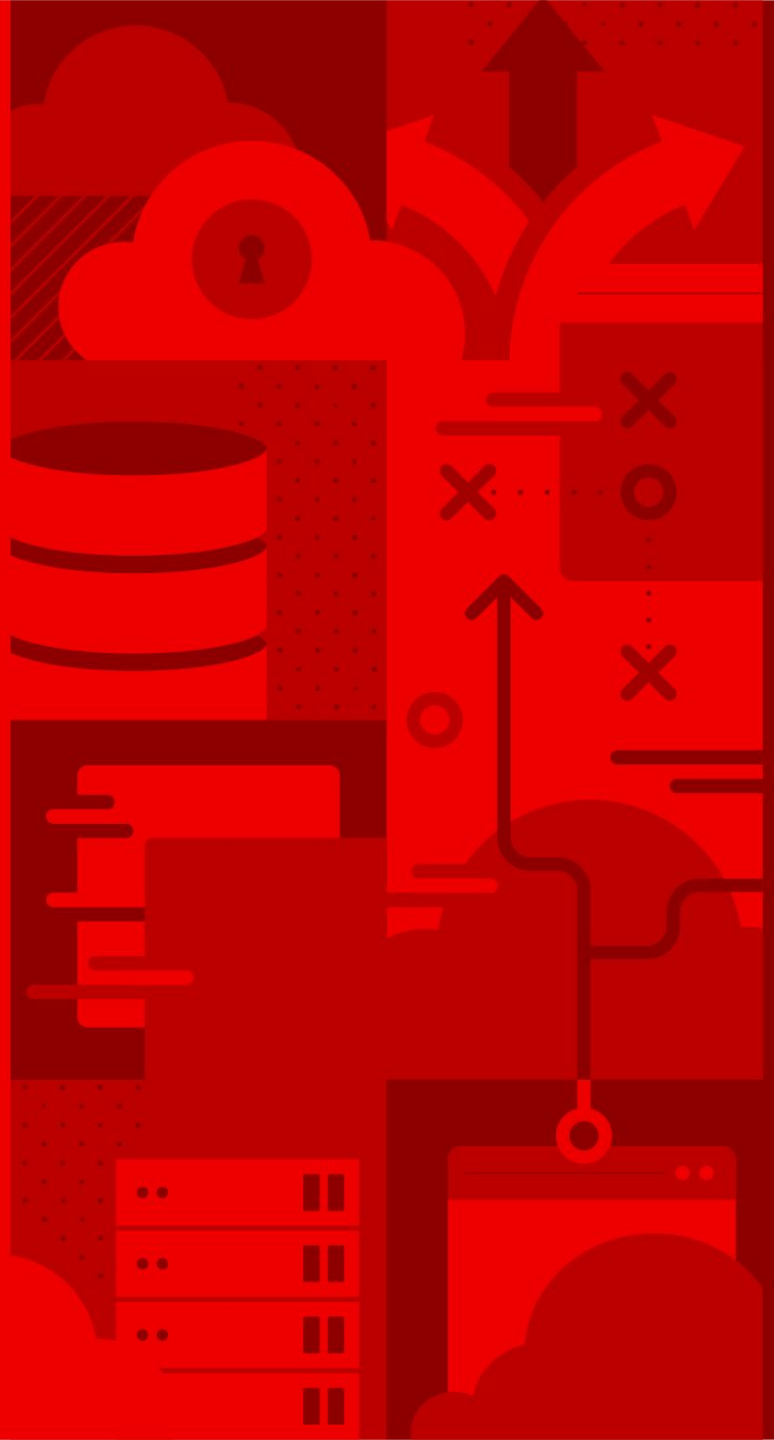
... is the basis of Red Hat OpenStack Platform

Red Hat OpenStack Platform

... can run OpenShift in a "Shift on Stack" configuration

Red Hat OpenShift

... is why there are OpenShift Commons briefings



Let's talk about ...

OpenStack

Red Hat

OpenStack is an open source project for building a private or public infrastructure-as-a-service cloud running on standard hardware

- Uses virtualized resources to build a cloud
- Relies on virtualization software
- Relies on a base operating system
- more info: **openstack . org**

What is a cloud?

NIST special publication 800-145

Five "essential characteristics"

- on-demand self-service
- broad network access
- resource pooling ("multitenancy")
- rapid elasticity
- measured service

The OpenStack architecture is a number of projects that provide different cloud services via REST APIs.

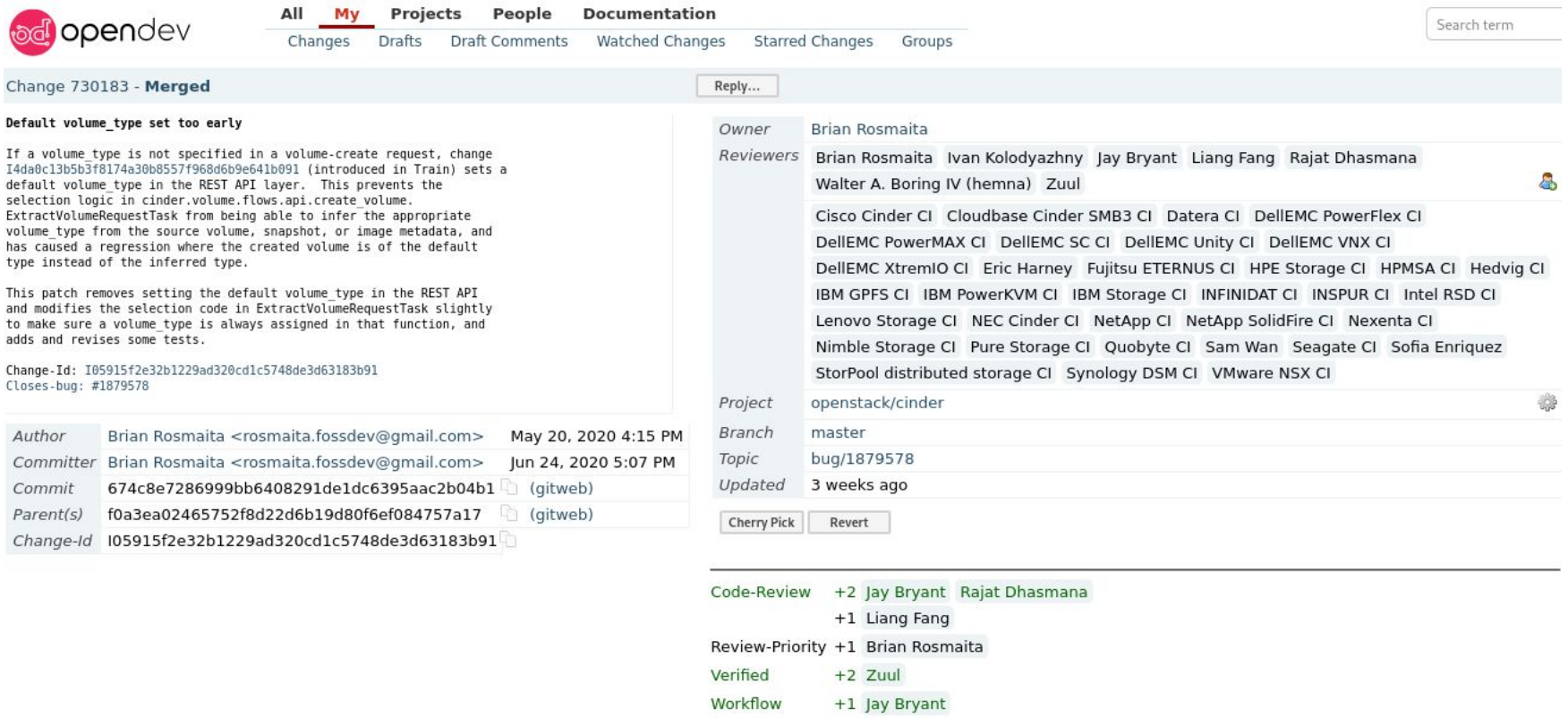
- Compute Service - Nova
- Networking Service - Neutron
- Image Service - Glance
- Block Storage Service - Cinder
- Identity Service - Keystone
- Object Store - Swift

The OpenStack architecture is a number of projects that provide different cloud services via REST APIs.

- There are more projects than "the dirty six"
- duckduckgo: **openstack api reference**

How code gets into OpenStack

Developers contribute code by posting a gerrit review to the appropriate project.



Red Hat

How code gets into OpenStack

Developers contribute code by posting a gerrit review to the appropriate project.

- **review . opendev . org / 730183**

How code gets into OpenStack

Sam Wan Patch Set 6: run-DellEMC SC CI May 28 9:57 PM

Walter A. Boring IV (hemna) May 29 11:12 AM ↩

Patch Set 6: Code-Review+2

(1 comment)

cinder/volume/flows/api/create_volume.py

Line 370:

```
you could also simply do an else here and set
identifier = {'source': 'default volume type',
                        'id': volume_types.DEFAULT_VOLUME_TYPE}
```

Rajat Dhasmana Jun 2 5:50 AM ↩

Patch Set 6: Code-Review-1

(2 comments)

-1 for the inline mentioned incorrect behavior.

cinder/volume/flows/api/create_volume.py

Line 370: instead of this, we can use [1] which will return default_volume_type (if CONF.default_volume_type is set) else it will return __DEFAULT__ type

after this change, i think the changes below aren't required as well

[1] https://github.com/openstack/cinder/blob/master/cinder/volume/volume_types.py#L175

Line 385: if we set wrong value/name in CONF.default_volume_type then this will assign the default volume type to the volume instead of error out on the wrong name/value set in conf file which is incorrect behavior

Brian Rosmaita Patch Set 6: (3 comments) Responses inline. Jun 11 2:33 PM

How code gets into OpenStack

Design work is done the same way.

- Features are proposed as "specs" that are ReST documents that are posted in gerrit and reviewed by the project community
- example: **review . opendev . org / 733555**
  - "Default volume type overrides"
  - Is it bikeshedding? (I don't think so!)
- duckduckgo: **openstack specs**

How code gets into OpenStack

Each patch goes through:

- an initial "check" by the Zuul CI system
- code reviews by other contributors
- revisions and approval
- the Zuul "gate"

How code gets into OpenStack

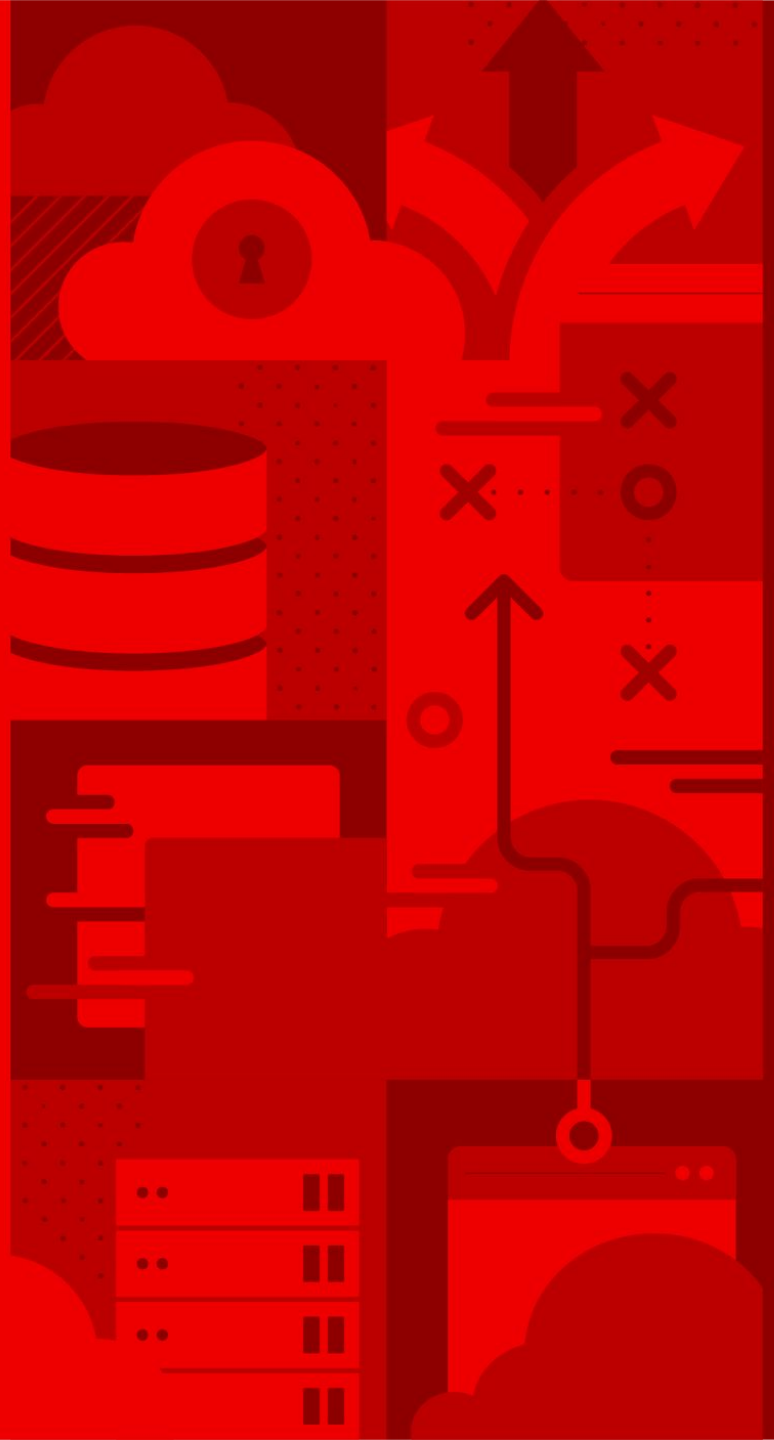
The gate is different from the check.

- takes into account other patches for other projects that are also being submitted
- you don't want to test a patch for Cinder against Nova and Glance the way they are right now, because when the Cinder patch is merged, Nova and Glance may be different from what was tested against
- **zuul . openstack . org**

How code gets into OpenStack

Zuul check (2 rechecks)	Jun 30 9:21 PM
openstack-tox-lower-constraints	SUCCESS in 12m 10s
openstack-tox-pep8	SUCCESS in 5m 17s
openstack-tox-py36	SUCCESS in 8m 54s
openstack-tox-py38	SUCCESS in 8m 45s
openstack-tox-docs	SUCCESS in 10m 58s
grenade	SUCCESS in 1h 04m 43s
tempest-integrated-storage	SUCCESS in 1h 06m 26s
build-openstack-releasenotes	SUCCESS in 7m 10s
cinder-tox-bandit-baseline	SUCCESS in 6m 23s (non-voting)
openstack-tox-functional-py36	SUCCESS in 5m 32s
openstack-tox-functional-py38	SUCCESS in 6m 39s
cinder-rally-task	SUCCESS in 33m 28s (non-voting)
openstack-tox-pylint	FAILURE in 4m 57s (non-voting)
cinder-plugin-ceph-tempest	SUCCESS in 1h 05m 35s
cinder-tempest-plugin-lvm-lio-barbican	SUCCESS in 1h 17m 27s
cinder-grenade-mn-sub-volbak	SUCCESS in 1h 13m 17s
cinder-tempest-lvm-multibackend	SUCCESS in 1h 12m 20s (non-voting)
devstack-plugin-nfs-tempest-full	SUCCESS in 51m 21s (non-voting)
tempest-slow-py3	SUCCESS in 2h 03m 54s
tempest-ipv6-only	SUCCESS in 49m 04s

Zuul gate (1 rechecks)	Jul 1 2:45 AM
openstack-tox-lower-constraints	SUCCESS in 15m 12s
openstack-tox-pep8	SUCCESS in 8m 46s
openstack-tox-py36	SUCCESS in 8m 48s
openstack-tox-py38	SUCCESS in 9m 22s
openstack-tox-docs	SUCCESS in 20m 38s
grenade	SUCCESS in 1h 01m 54s
tempest-integrated-storage	SUCCESS in 1h 07m 00s
build-openstack-releasenotes	SUCCESS in 7m 53s
cinder-grenade-mn-sub-volbak	SUCCESS in 1h 10m 43s
cinder-plugin-ceph-tempest	SUCCESS in 1h 23m 14s
tempest-ipv6-only	SUCCESS in 56m 37s



Let's talk about ...

Red Hat OpenStack Platform

Red Hat

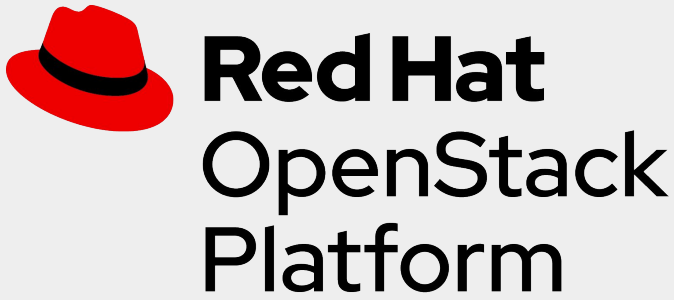
That's all very nice, but ...

You don't want OpenStack ... what you want is OpenStack plus virtualization plus an operating system, and you would like it in an easy-to-install package.

- It's not enough for the OpenStack code to be solid, it must integrate well with the all the other OpenStack components and the virtualization and operating system layers
- Red Hat OpenStack Platform is a distribution of OpenStack that is appropriately packaged and tested to work with RHEL.

Making the sausage

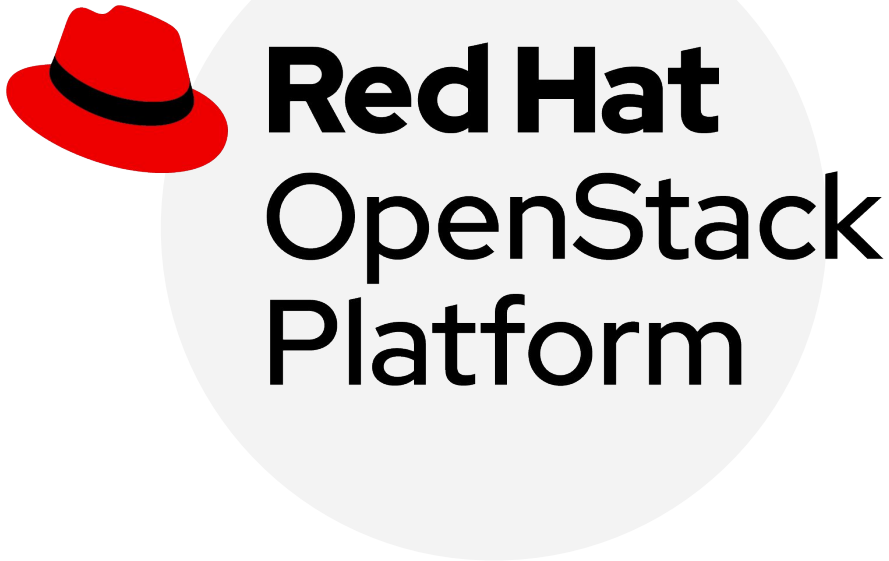
From code to cloud



RDO

RPM Distribution of OpenStack

- **rdoproject . org**
- a community distribution of OpenStack
- deploys a cloud using Triple-O ("OpenStack on OpenStack", another OpenStack project)
  - provides an OpenStack *undercloud* that an operator uses to deploy an *overcloud*, which is the environment that cloud users interact with
- packaged in RPMs and tested on CentOS



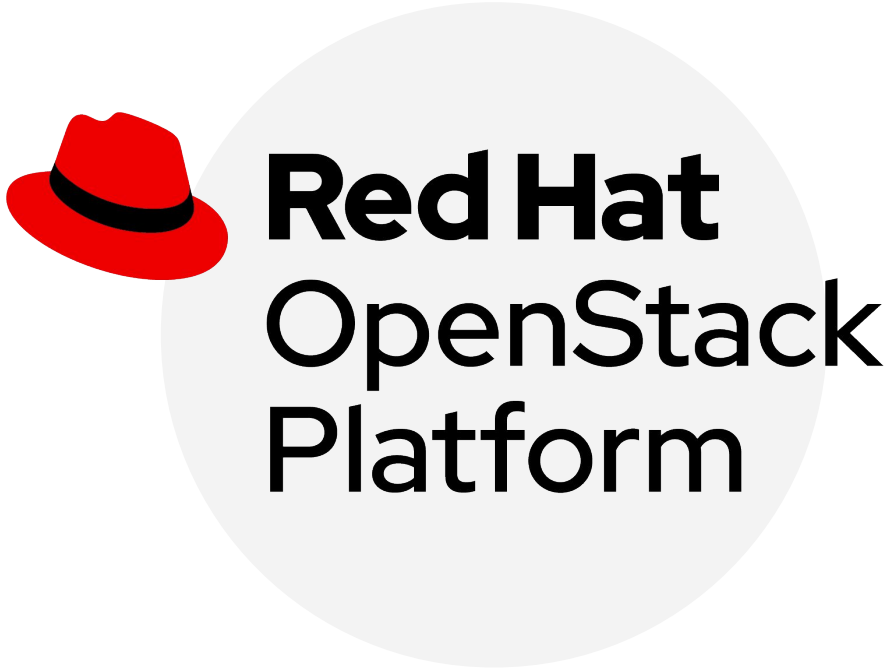
Red Hat OSP

Finally!

- an enterprise-grade distribution of OpenStack
- packaged for RHEL
- tested - both automated testing and manual testing of key features

Red Hat OSP 16

Current Release



- built on the OpenStack Train release
- 16.0 released 6 Feb 2020 (RHEL 8.1)
- 16.1.0 beta on 27 May 2020 (RHEL 8.2)
  - GA real soon - probably within a week or so

Open Infrastructure Summit (Berlin 2020)

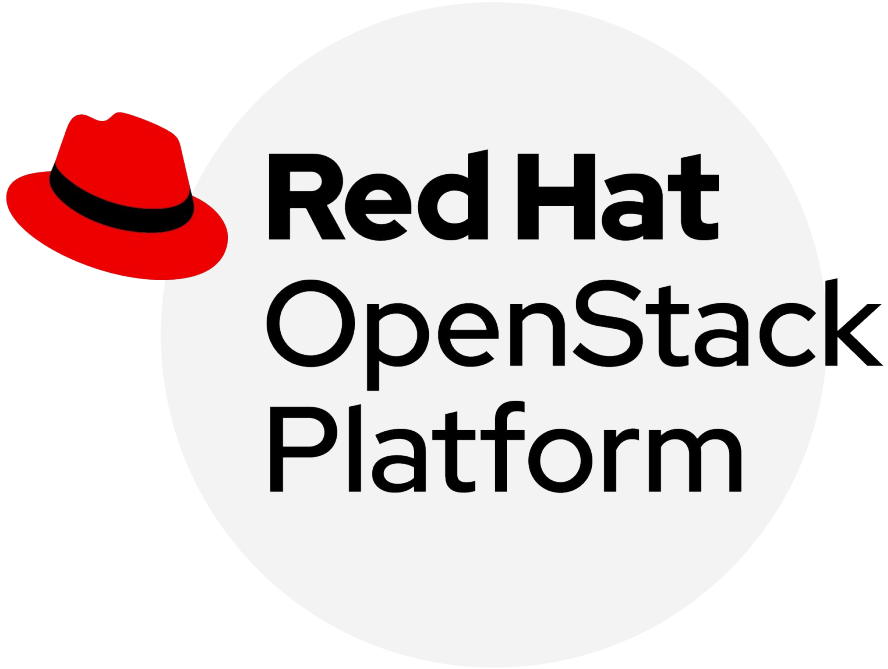
- October 19-23, 2020
- will be held virtually … *and there is no cost to attend!*
- to register: **openstack . org / summit /2020**

OpenStack PTG (Berlin 2020)

- This is where the design discussions for the Wallaby release take place
- around the week of October 19-23, 2020
- will be held virtually
- probably no cost to attend?
- watch: **openstack . org / ptg**

Red Hat OSP 16

Current Release



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Upstream OpenStack Releases

cadence: release every 6 months

Train

Planning was done in Denver at a hotel with a remarkably loud train outside.

16 October 2019

Ussuri

The Ussuri River has a reputation for catastrophic floods.

13 May 2020

Victoria

We are not amused.

14 October 2020

OpenStack Versioning

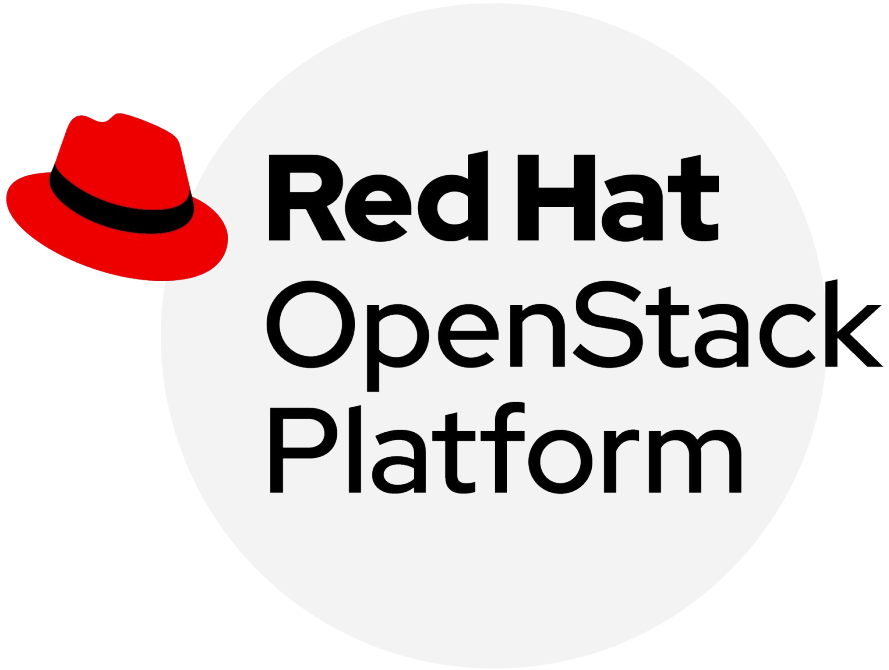
... is very confusing

OpenStack is a coordinated release of a set of deliverables, each of which has its own version number, so a release is referred to by its name. For Train:

- Nova: version 20.0.0
- Glance: version 19.0.0
- Cinder: version 15.0.0
- Red Hat OSP: version 16

Red Hat OSP 16

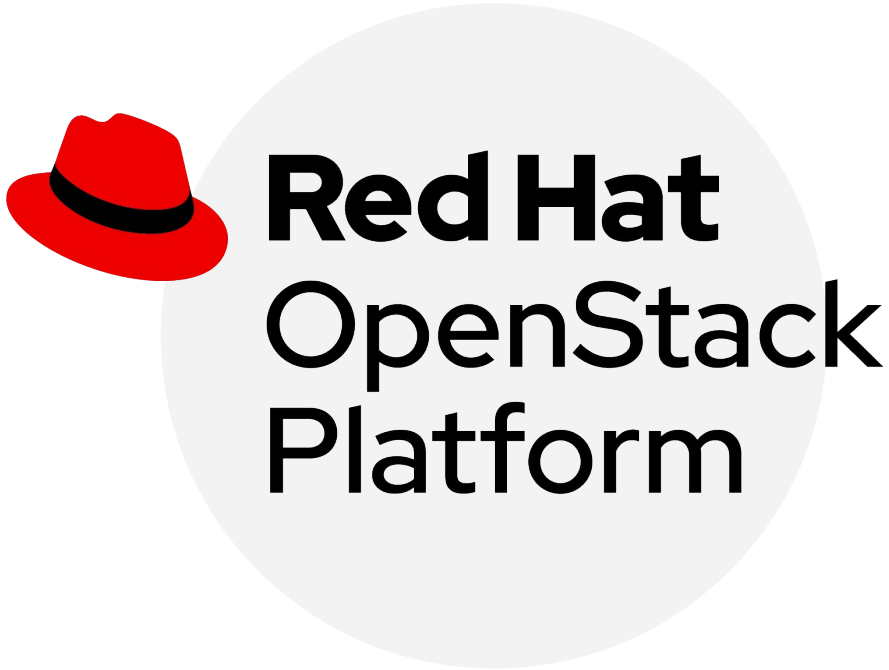
Current Release



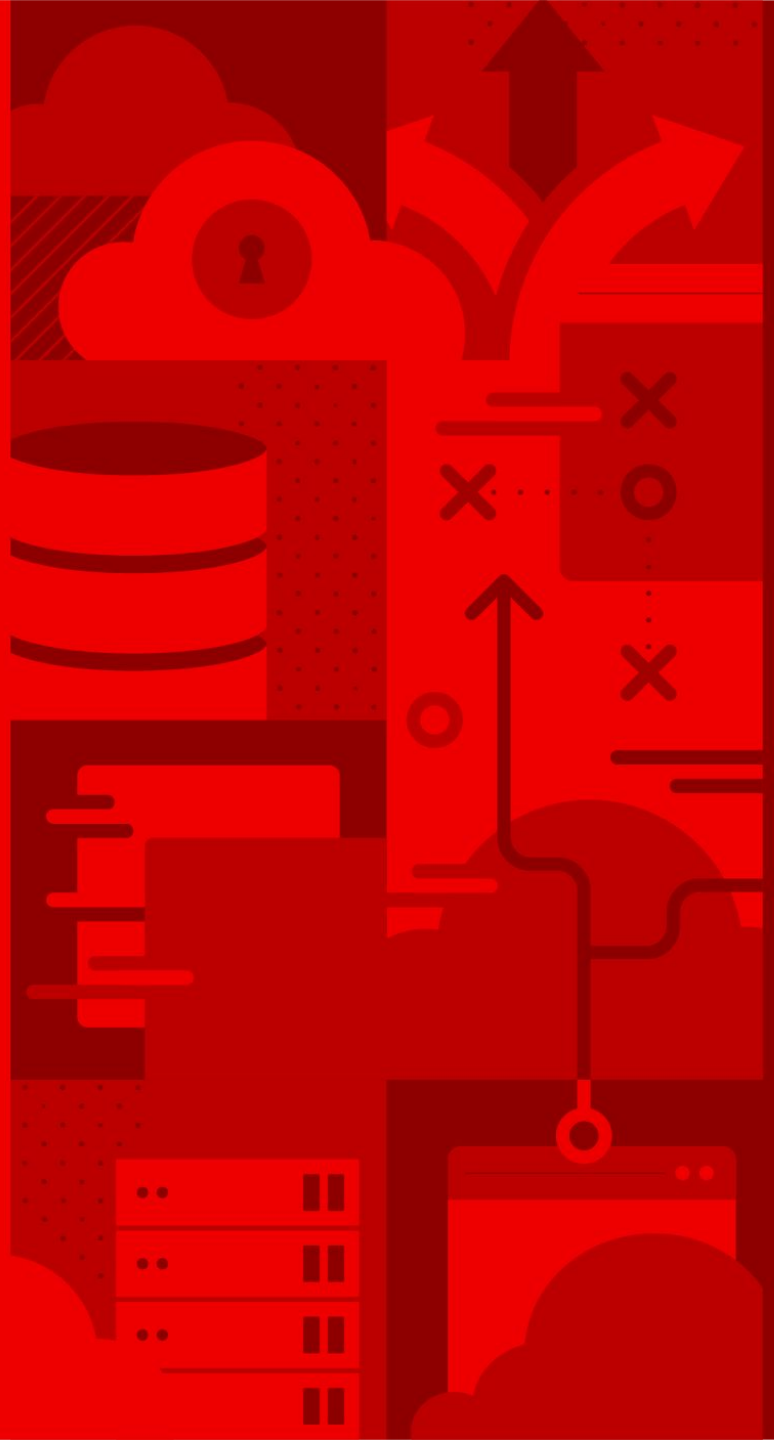
- built on the OpenStack Train release
- is a Long Life Release
- current plan is no more short-term releases
- future 16 versions may contain some U or V features
- want to keep OSP in closer sync with RHEL

Red Hat OSP 16

Python Version



- Train is the last OpenStack release to support Python 2.7
- RH OSP 16 only supports RHEL 8
- The default, fully supported version of Python in RHEL 8 is Python 3.6
- So RH OSP only supports running on Python 3.6
- Upstream
  - Ussuri: Python 3 only (3.6 and 3.7)
  - Victoria: Python 3.6 and 3.8



Let's talk about ...

Glance

Red Hat

OpenStack Glance

The OpenStack Image Service

- Provides services and associated libraries to *store*, *browse*, *share*, *distribute*, and *manage* bootable disk images, other data closely associated with initializing compute resources ... and metadata definitions.
- docs: **glance . openstack . org**
- code: **opendev . org / openstack / glance**

OpenStack Glance

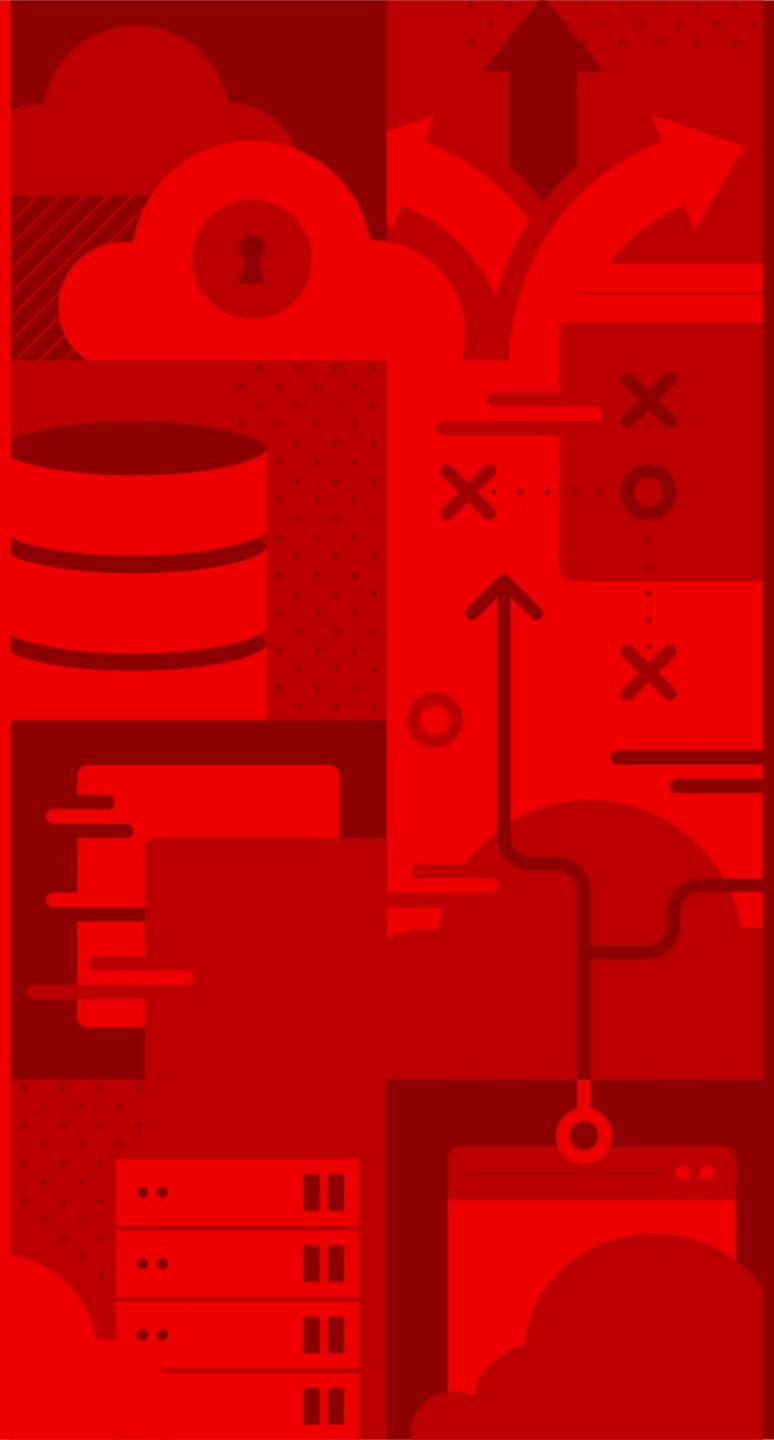
Recent Developments

- Interoperable image import
  - allows plugins to process uploaded image data
- multiple stores
- enhancements for DCN ("edge") deployments
  - ability to move image data closer to where it will be used

OpenStack Glance

Community

- Project Team Leader is Abhishek Kekane (Red Hat)
- 75% of the core team is from Red Hat
- To contribute: **glance . openstack . org**
  - look for "Glance Contribution Guidelines"



Let's talk about ...

Cinder

Red Hat

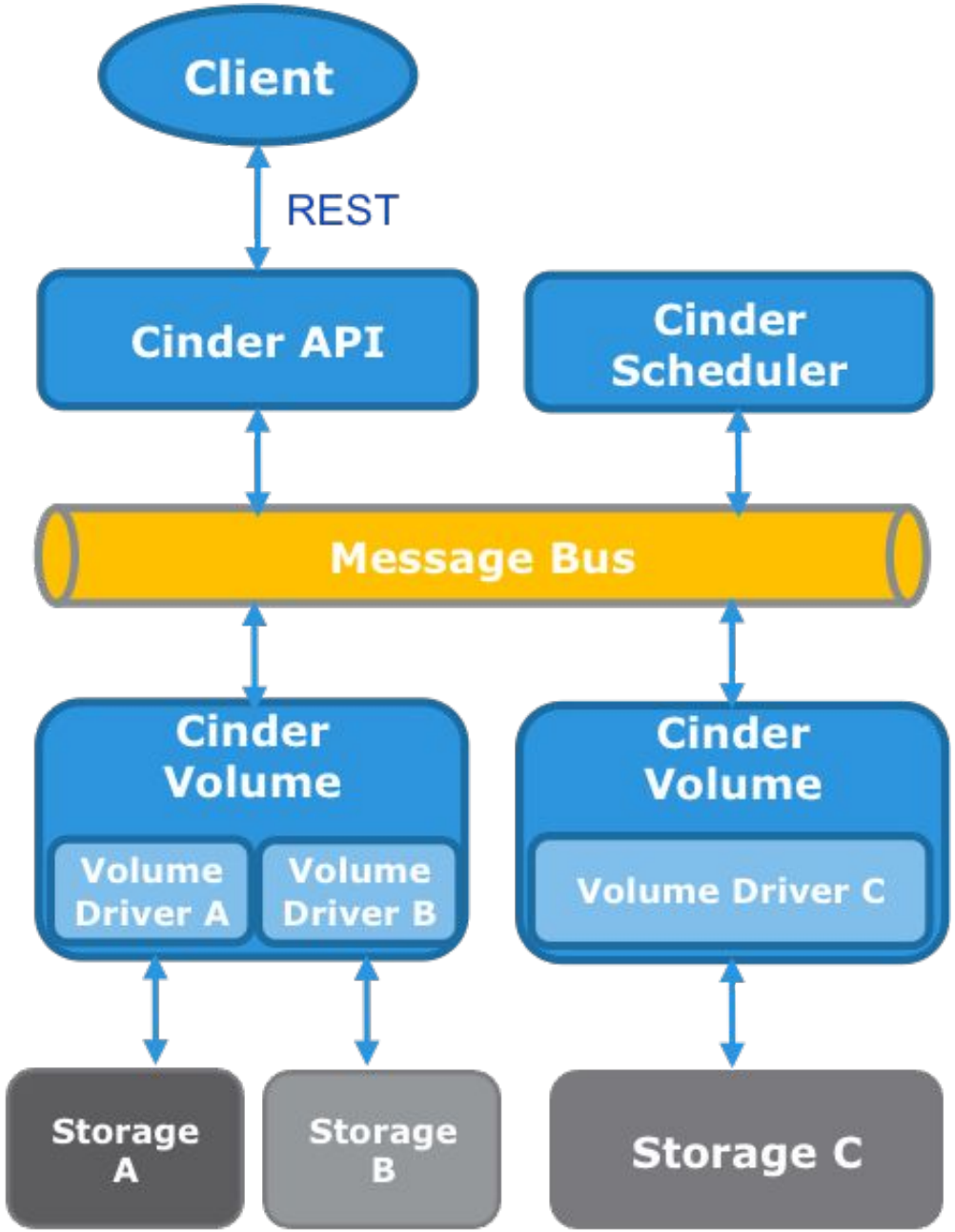
OpenStack Cinder

The OpenStack Block Storage Service

- Implements services and libraries to provide on demand, self-service access to Block Storage resources.
- Provides Software Defined Block Storage via abstraction and automation on top of various traditional backend block storage devices.
- docs: **cinder . openstack . org**
- code: **opendev . org / openstack / cinder**

OpenStack Cinder

General Architecture



Red Hat

OpenStack Cinder

About the Drivers

- There are over 70 drivers in the cinder code repository
- Drivers mediate between the Block Storage API, which provides a consistent interface to users, and particular storage backends
- 'Supported' drivers have functioning third-party CI systems that run on every patch proposed to cinder
- The 3rd party CI provides additional information when patches are reviewed

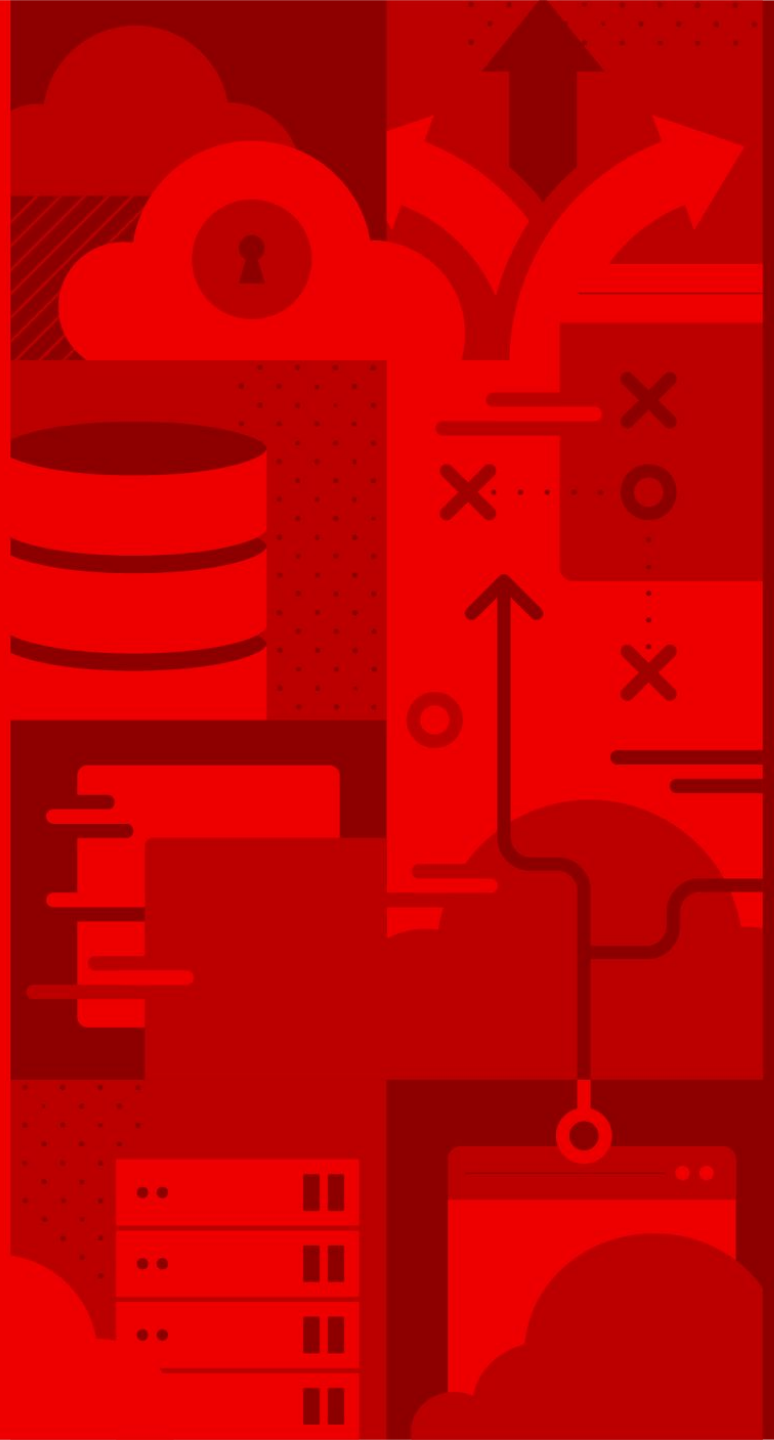
Cinder Third Party CI

Cisco Cinder CI (2 rechecks)	Jun 30 9:00 PM
dsvm-tempest-cisco-zonemanager-job	FAILURE in 35m 23s
Cloudbas... SMB3 CI (2 rechecks)	Jun 30 8:14 PM
cinder-iscsi	SUCCESS in 1h 01m 23s
cinder-smb	FAILURE in 54m 55s
Datera CI	Jun 24 5:24 PM
datera-jenkins	SUCCESS
DellEMC PowerFlex CI	Jun 25 4:49 AM
DellEMC_VxFlexOS	SUCCESS in 2h 12m 16s
DellEMC PowerMAX CI	Jun 25 5:50 PM
DellEMC_PowerMAX_FC	SUCCESS in 5h 24m 53s
DellEMC_PowerMAX_iSCSI	ABORTED in 1m 52s
DellEMC SC CI	Jun 30 10:53 PM
DellEMC_SC_FC	SUCCESS in 1h 16m 49s
DellEMC_SC_iSCSI	SUCCESS in 1h 31m 29s
DellEMC Unity CI	Jun 25 12:32 AM
DellEMC_Unity_FC	SUCCESS in 1h 33m 16s
DellEMC_Unity_iSCSI	SUCCESS in 1h 37m 56s
Quobyte CI (1 rechecks)	Jun 30 10:26 PM
cinder-quobyteci-dsvm-volume	SUCCESS
Seagate CI	Jul 3 8:15 AM
Seagate-iSCSI	SUCCESS in 45:40.35
Seagate-FC	SUCCESS in 47:53.92
StorPool...orage CI (1 rechecks)	Jun 30 9:03 PM
cinder-storpool-tempest	RETRY_LIMIT in 11m 50s
Synology DSM CI (1 rechecks)	Jun 30 10:17 PM
synology-dsm-cinder-iscsi	FAILURE in 55m 14s
VMware NSX CI (2 rechecks)	Jun 30 7:53 PM
dsvm-cinder	SUCCESS in 40m 21s

OpenStack Cinder

About the Drivers

- The 3rd party CI run the OpenStack integration test suite ("tempest") *plus* additional cinder-focused API and scenario tests contained in the cinder-tempest-plugin
- We can add extra integration tests for drivers to focus on particular areas of functionality for particular configurations
- example: **review . opendev . org / 737380**



Let's talk about ...

Cinder and OpenShift

Red Hat

Container Storage Interface

- Specifies an interface to enable a storage vendor to develop a single plugin that will work across all container systems supporting the standard
- Storage vendors do not have to touch the core code of the container orchestration system

Cinder and CSI

- When running OpenShift in a Shift on Stack configuration, Cinder is available via the cinder-csi-plugin
- Whatever storage backends an operator configures for Cinder can be used to serve persistent volumes in OpenShift

Cinder and CSI

- What about when not running OpenShift on top of OpenStack?
- Cinder can be run in "standalone" mode (OpenSDS takes this approach)
- Gives you a wide choice of backends, but is very heavyweight

cinderlib

- a Python library that allows cinder storage drivers to be used outside of cinder
- a deliverable of the OpenStack Cinder project
- removes the DBMS, message broker, Block Storage API, scheduler, and volume manager layers
- cinderlib 2.0.0 was released last week
  - code: **opendev.org / openstack / cinderlib**

cinderlib

- Allows you to take advantage of all the tested driver code from cinder
- Allows vendors to re-use the driver code they have developed for cinder
  - Hitachi and Dell/EMC have added new drivers for the Victoria release

Ember CSI

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- **ember-csi . io**

Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.

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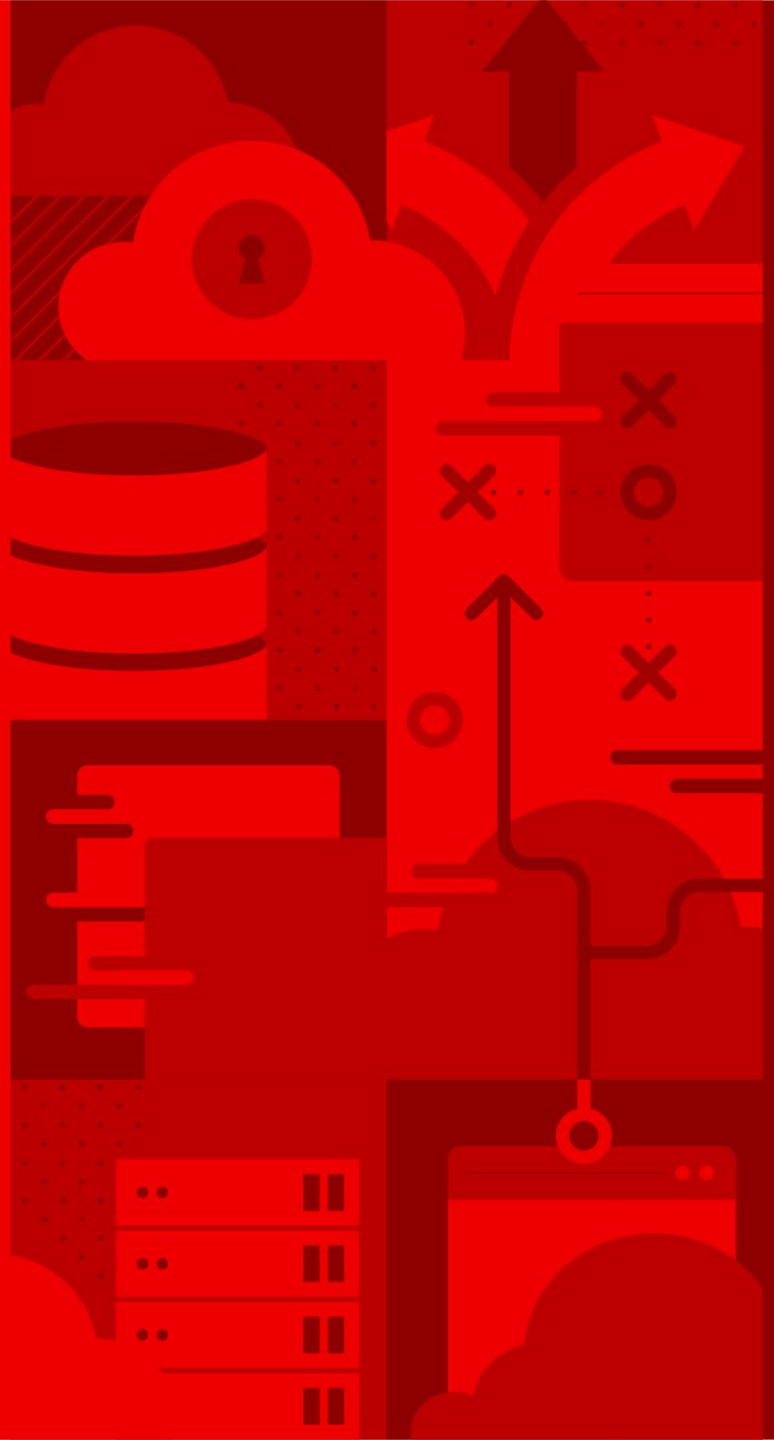
youtube.com/user/RedHatVideos

twitter.com/RedHat

Red Hat



and now ...

Ask Me Anything

Red Hat