

# OpenStack Cinder Deep Dive

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# Cinder's Mission

To implement services and libraries to provide on-demand, self-service access to Block Storage resources via abstraction and automation on top of other block storage devices.

# Cinder drivers

Cinder is an abstraction layer for around 80 storage backends:

- ▶ Open: LVM, GlusterFS, Ceph, NFS. . .
- ▶ Proprietary: NetApp, SolidFire, Dell, EMC, HPE, Fujitsu, Hitachi, IBM, Lenovo, VMWare, Violin, Quobyte, Scality, Tegile. . .
- ▶ Protocols: iSCSI, NFS, RBD, Fiber Channel, proprietary. . .
- ▶ Backup: Swift, RBD, GlusterFS, NFS, IBM TSM

# Required features

- ▶ Volume Create/Delete
- ▶ Volume Attach/Detach
- ▶ Snapshot Create/Delete
- ▶ Create Volume from Snapshot
- ▶ Get Volume Stats
- ▶ Copy Image to Volume
- ▶ Copy Volume to Image
- ▶ Clone Volume
- ▶ Extend Volume

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  - ▶ Replication v1 - single volume replication
  - ▶ Replication v2 - backend-level replication

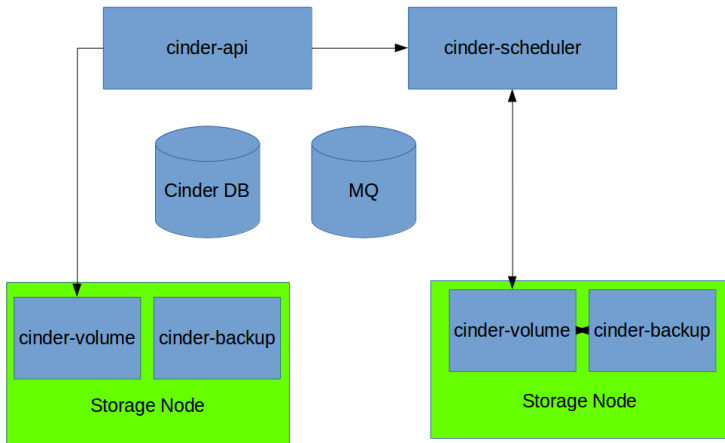
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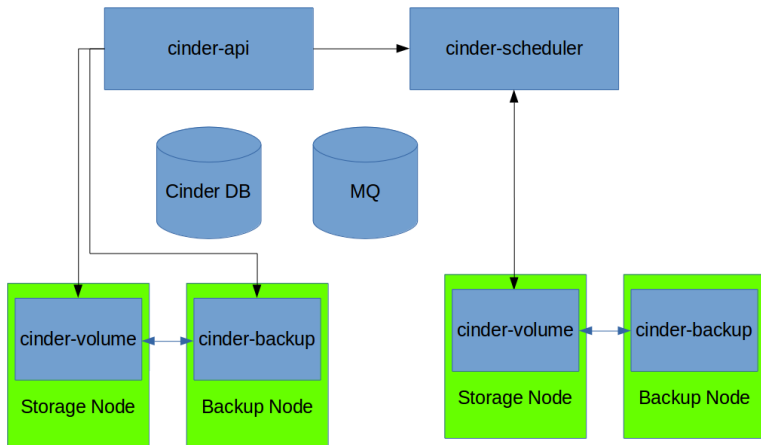
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- ▶ *QoS support*
  - ▶ Moderate number of supporting drivers

# Architecture (pre-Mitaka)



# Architecture (since Mitaka)



# Architecture

The image shows a development environment with a file explorer on the left, a code editor in the center, and a commit message dialog on the right.

**File Explorer (Left):**

File Name	Path	Owner	Count
40 643f9169	1/10/13	Huang	11
41 c53d8e34	5/3/12	Jenkins	1
42 c53d8e34	5/3/12	Jenkins	1
43 643f9169	1/10/13	Huang	11
44 d17cc23c	2/14/13	Huang	12
45 d17cc23c	2/14/13	Huang	12
46 643f9169	1/10/13	Huang	11
47 c53d8e34	5/3/12	Jenkins	1
48 a771e45a	6/3/13	Vilgelm	16
49 a771e45a	6/3/13	Vilgelm	16
50 a771e45a	6/3/13	Vilgelm	16
51 3fd7857a	1/6/14	Traeger	28
52 3fd7857a	1/6/14	Traeger	28
53 a771e45a	6/3/13	Vilgelm	16
54 c53d8e34	5/3/12	Jenkins	1
55 c53d8e34	5/3/12	Jenkins	1
56 c53d8e34	5/3/12	Jenkins	1
57 51418bdd	11/27/12	Griffith	8
58 c53d8e34	5/3/12	Jenkins	1
59 12e4d923	12/3/15	Pham	57
60 863b6afe	7/19/12	Bryant	3
61 bcd9f363	3/10/14	Percoco	32
62 bcd9f363	3/10/14	Percoco	32
63 6c78bd12	2/18/13	Basnight	13
64 6c78bd12	2/18/13	Basnight	13
65 c53d8e34	5/3/12	Jenkins	1
66 a771e45a	6/3/13	Vilgelm	16

**Code Editor (Center):**

```
from cinder.volume import rpcapi

scheduler_driver_opt = cfg.StrOpt(
    'scheduler_driver_opt',
    default=None,
    help='The driver to use for scheduling volumes.'
)

CONF = cfg.CONF
CONF.register_opt(scheduler_driver_opt)

QUOTAS = quota.QUOTAS

LOG = logging.getLogger(__name__)

class SchedulerManager(manager.Base):
    """Chooses a host to create a volume on"""

    RPC_API_VERSION = '1.11'

    def __init__(self, scheduler_driver=None, service_name=None,
                 *args, **kwargs):
        if not scheduler_driver:
            scheduler_driver = CONF.scheduler_driver

    def target = messaging.Target(version=RPC_API_VERSION)
```

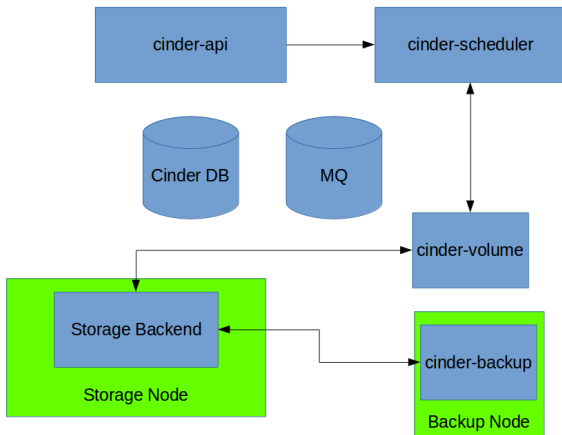
**Commit Message Dialog (Right):**

Commit Message

Initial fork out of Nova.

Close

# Architecture (non-LVM-backends)



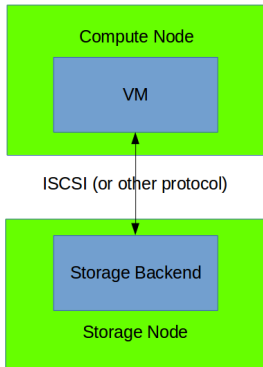
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  - ▶ Deployment without `enabled_backends` option is deprecated in Newton
- ▶ Cinder usage outside of OpenStack
  - ▶ `python-brick-cinderclient-ext` project
  - ▶ You'll still need DB (MySQL), MQ (RabbitMQ) and Keystone

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- ▶ cinder-volume service clustering *AKA c-vol A/A HA support*
  - ▶ Right now it is still risky to run multiple c-vols controlling a single storage backend

# Thank you!

<https://github.com/dulek/openstack-meetup-wroclaw-cinder>

remind me to switch to next slide for Q&A

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