

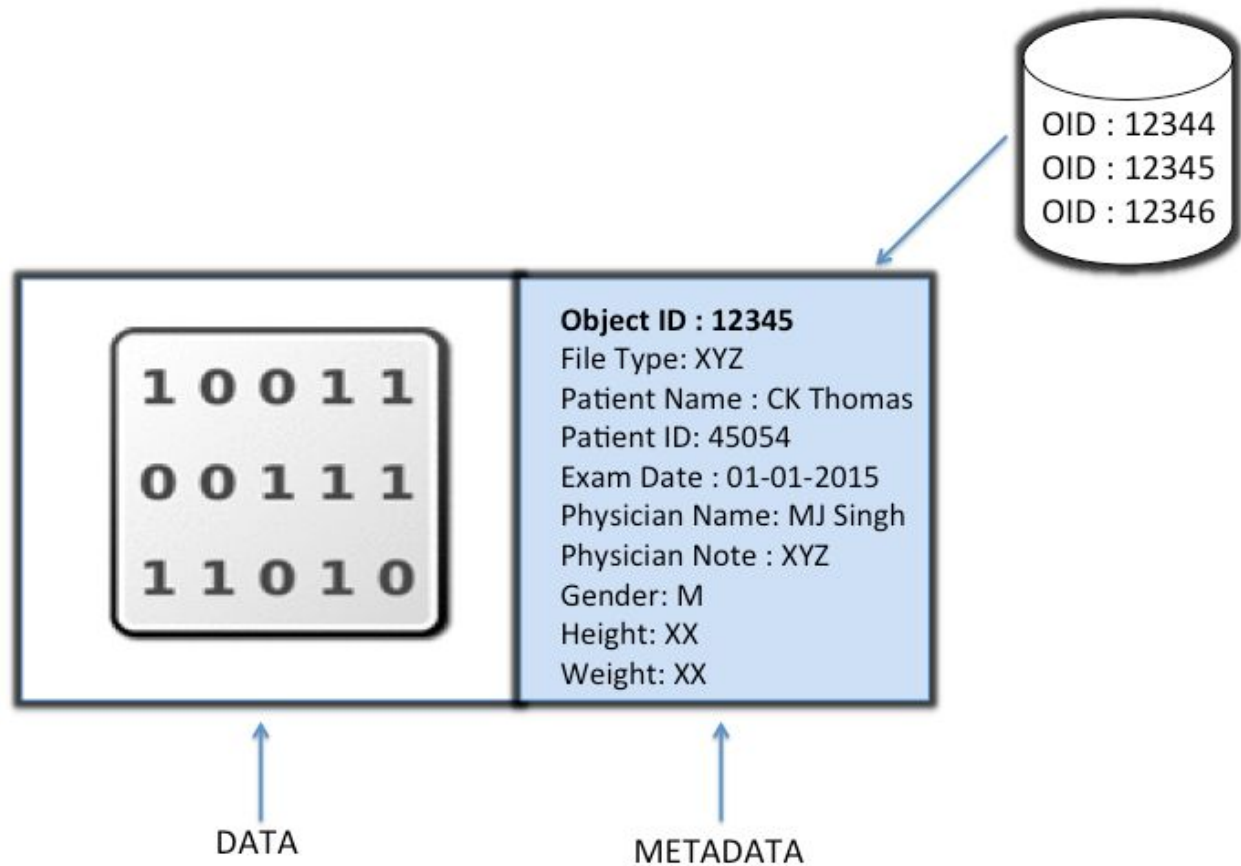
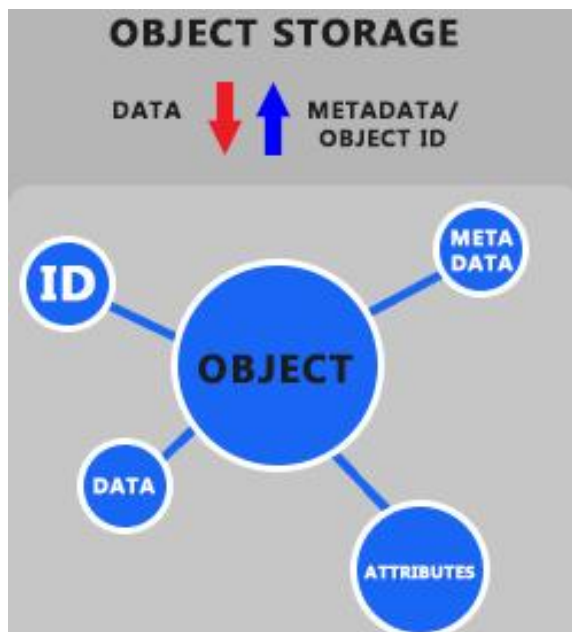
OpenStack Cinder Volume Backups

- Store and Restore Using Object Storage

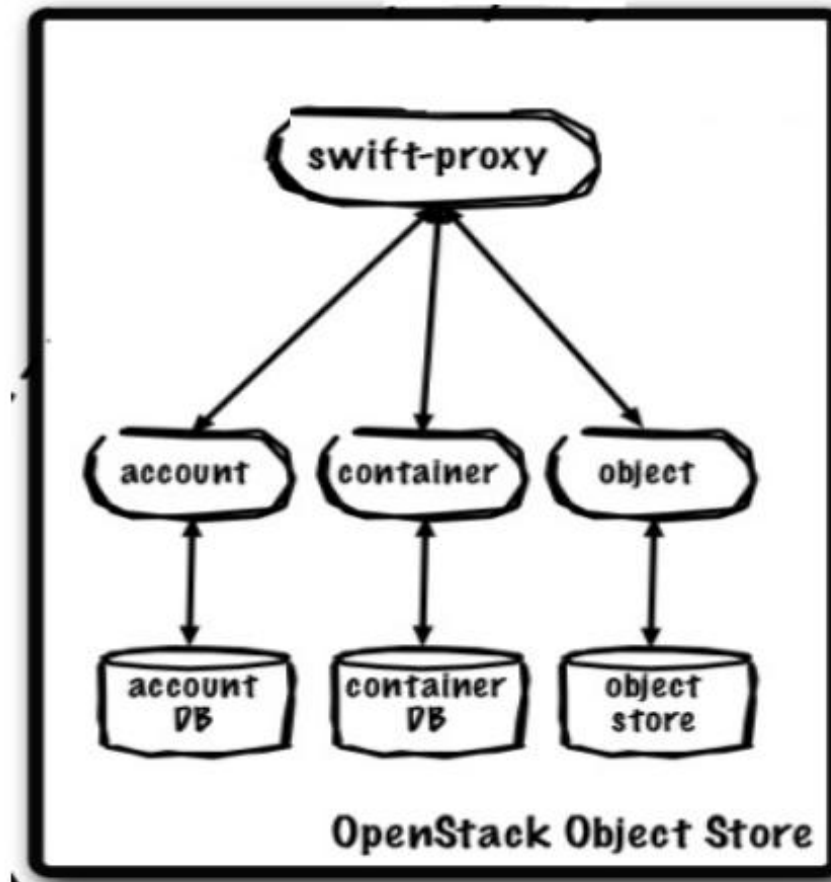
***Presented by
Sivaram and Nikesh***

Using Object Storage like OpenStack Swift, Ceph, Google Cloud Storage (GCS), etc to store OpenStack Cinder volume backups

Object Storage

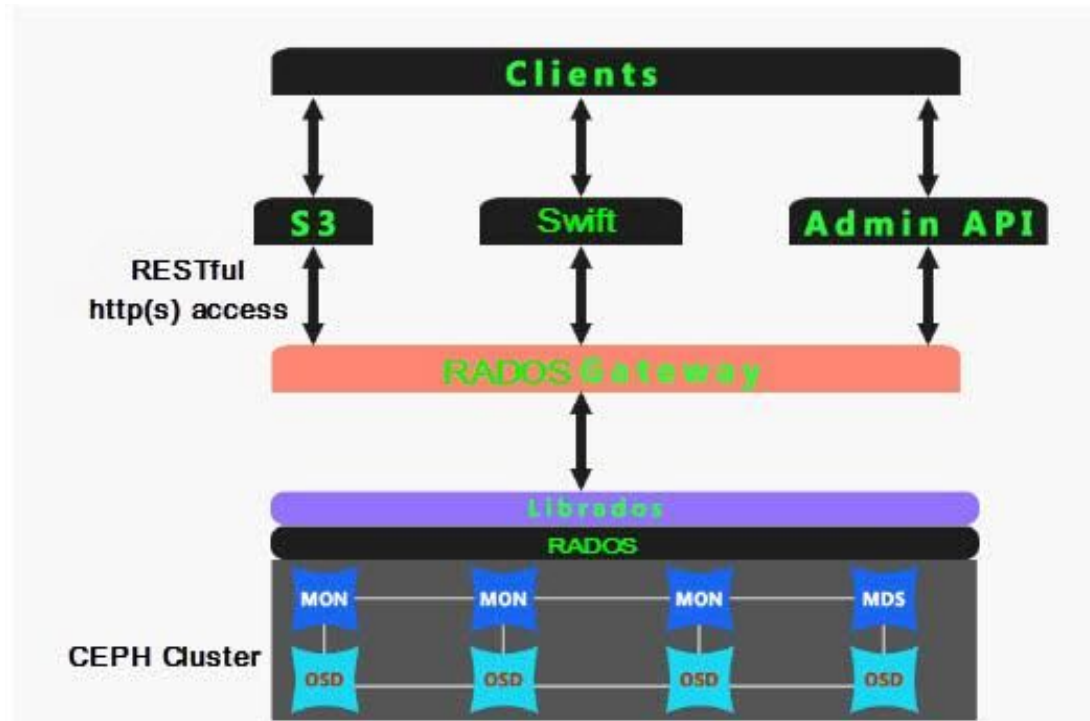


Object Storage - Swift

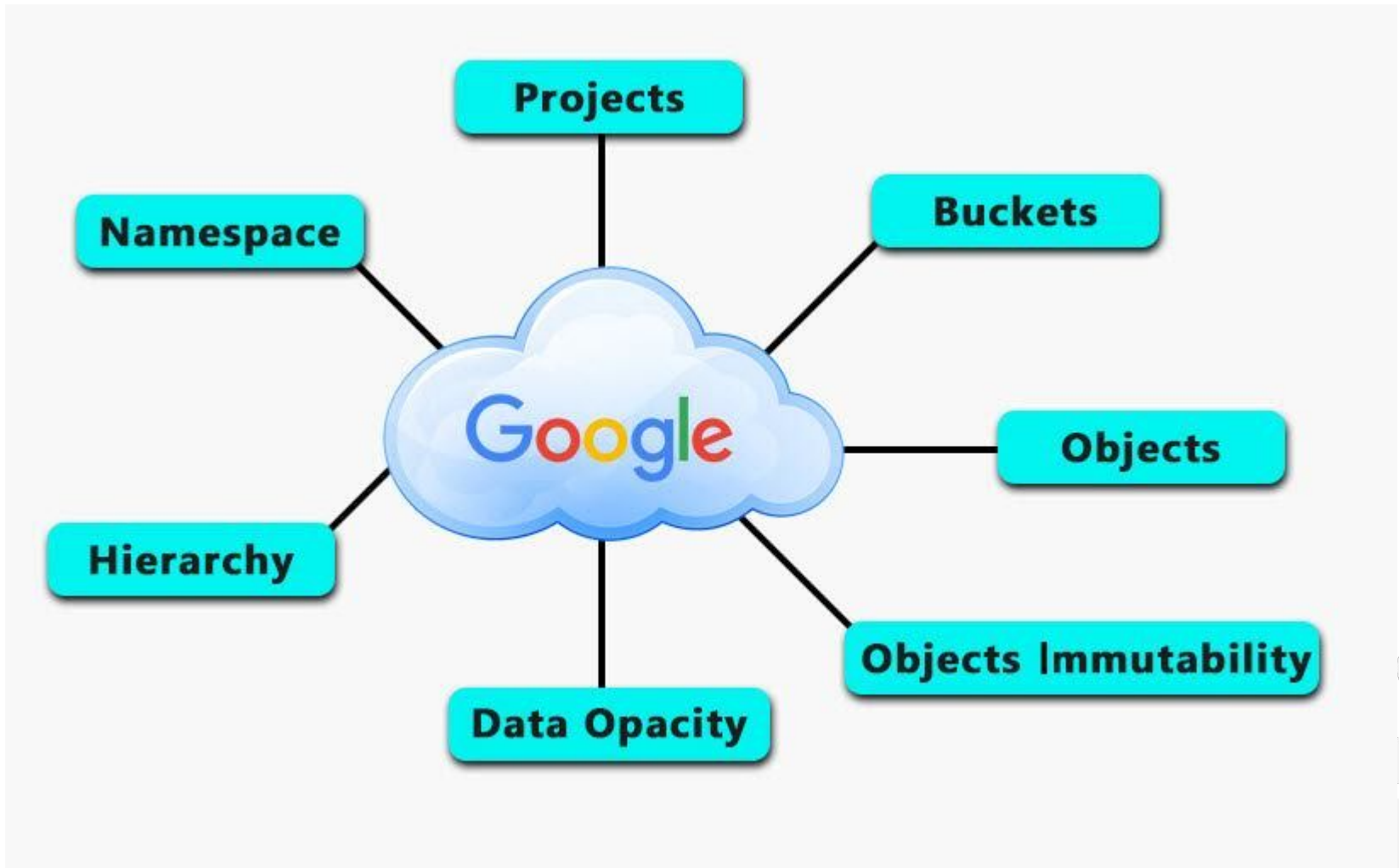


Reference: OpenStack

Object Storage - Ceph

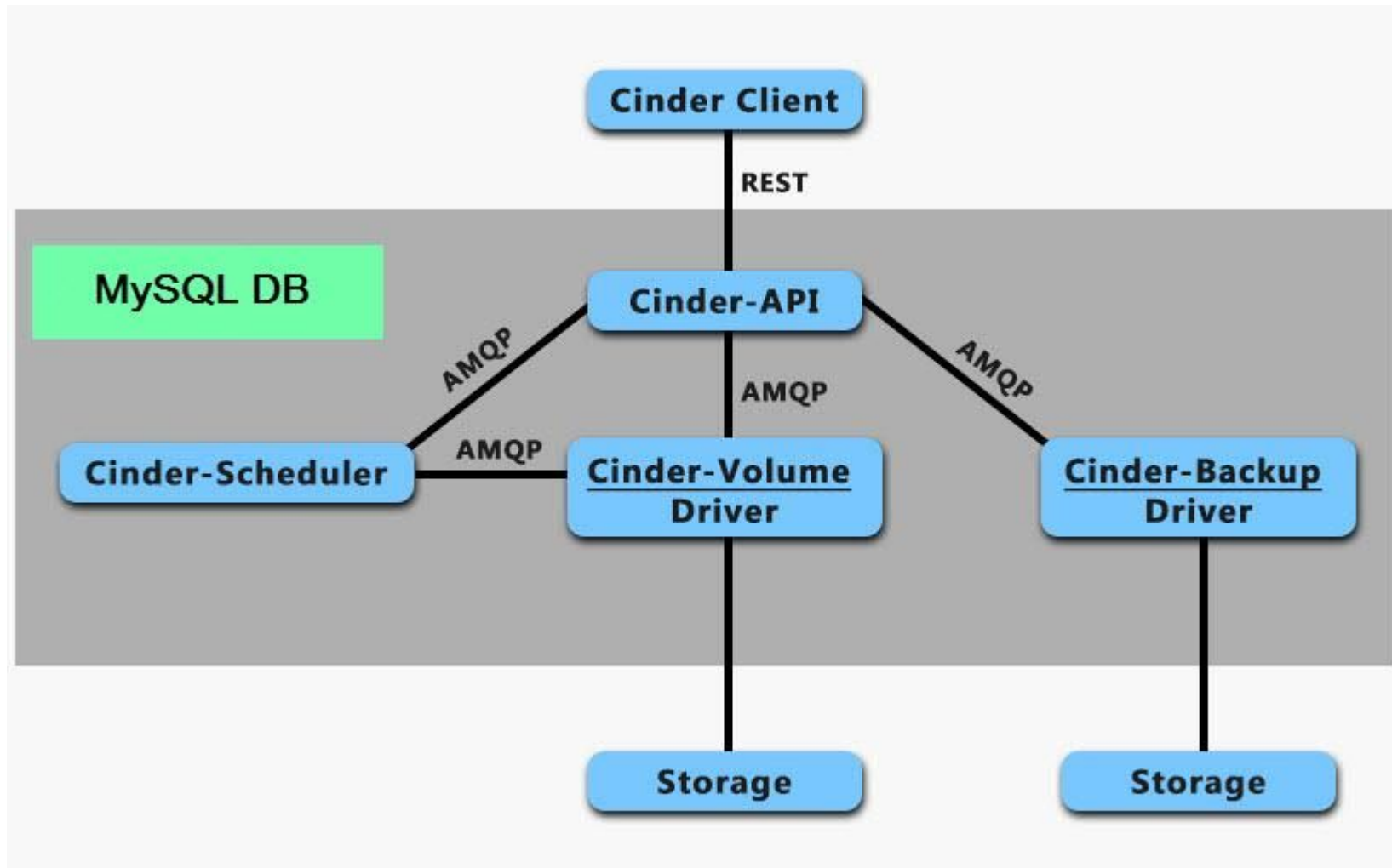


Object Storage - Google Cloud Support

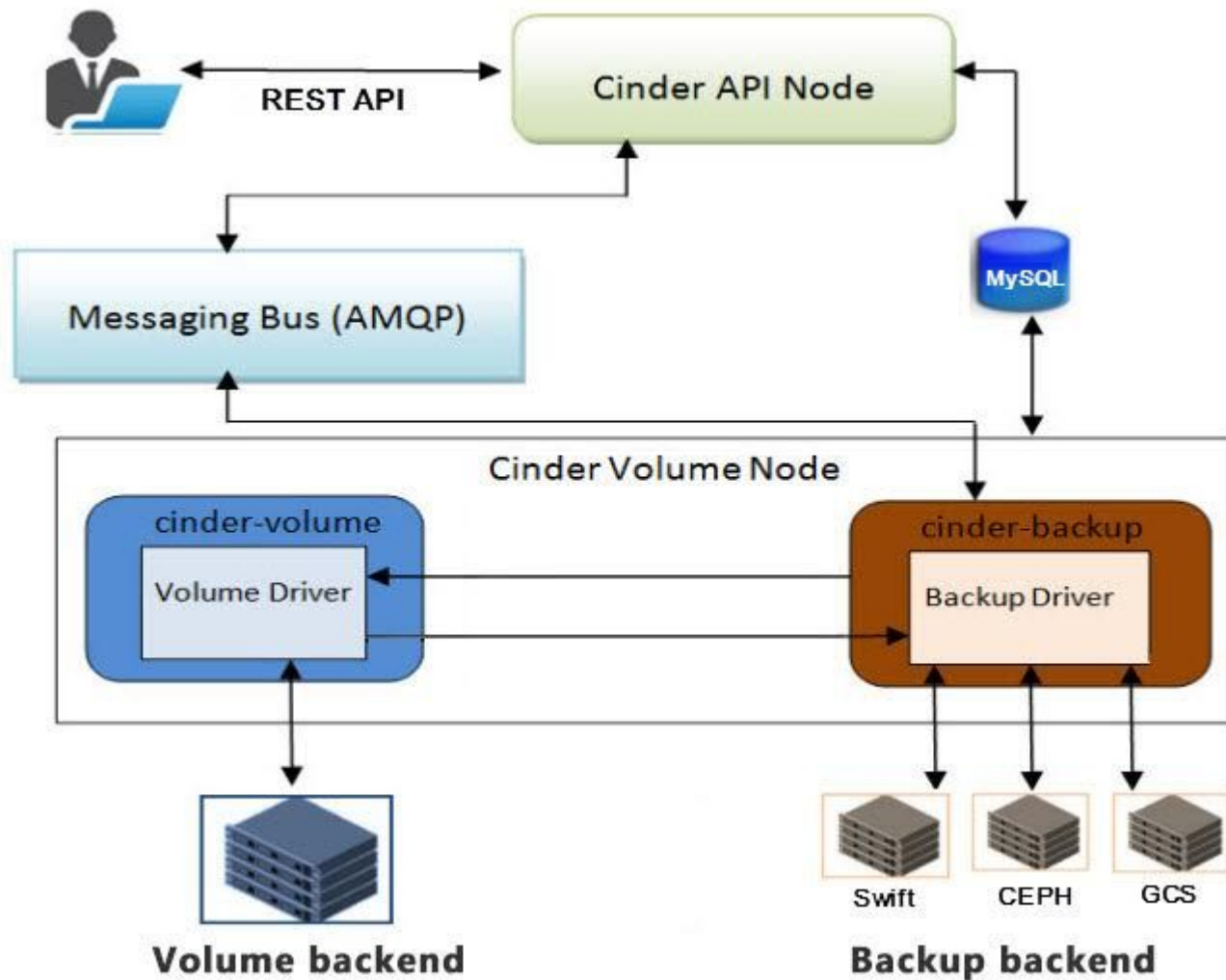


Block Storage - Volume Provisioning - Cinder

Cinder Service - Provisioning and attaching Volumes to Instances



Cinder Backup Service - Backup and Restore



Configure Cinder Backup Driver - GCS

→ Setup Google Service Account

- Login to Google developer console with Google account

<https://console.cloud.google.com>

- The Google Developers Console uses projects to manage resources.



- Create a Google Project

Create a project

The Google Developers Console uses projects to manage resources. To get started, create your first project.

Project name ?

Project ID ?



[Show advanced options...](#)

Please email me updates regarding feature announcements, performance suggestions, feedback surveys and special offers.

☒ Yes ☐ No

I agree that my use of any [services and related APIs](#) is subject to my compliance with the applicable [Terms of Service](#).

☒ Yes ☐ No

Create

- Goto Credentials
- Click on “Create credentials”
- Next Click on “Service account key”

API Manager

Overview

Credentials

Credentials OAuth consent screen Domain verification

API key
Identifies your project using a simple API key to check quota and access.
For APIs like Google Translate.

OAuth client ID
Requests user consent so your app can access the user's data.
For APIs like Google Calendar.

Service account key
Enables server-to-server, app-level authentication using robot accounts.
For use with Google Cloud APIs.

Help me choose
Asks a few questions to help you decide which type of credential to use.

Create credentials ▾

- Create a Google Service Account Key

API

API Manager

Overview

Credentials

←

Create service account key

Service account

New service account

Service account name ?

gcscinder

Service account ID

gcscinder @groovy-works-132123.iam.gserviceaccount.com

Key type

Downloads a file that contains the private key. Store the file securely because this key can't be recovered if lost.

☒ JSON

Recommended

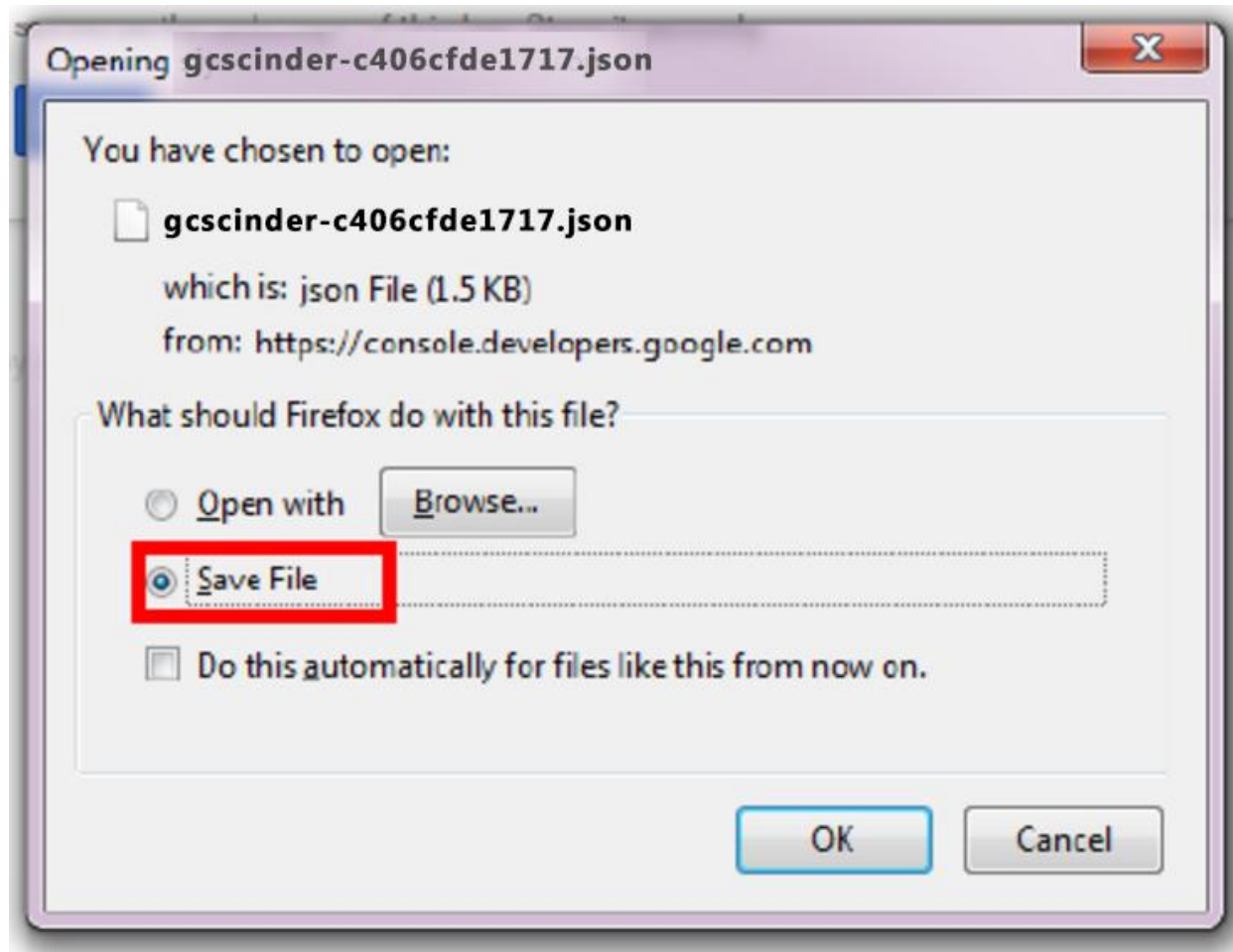
☐ P12

For backward compatibility with code using the P12 format

Create

Cancel

- Save the JSON file on the Cinder Backup Server Node:



→ Edit the cinder.conf file for Google Cloud Storage Backup Driver

```
[DEFAULT]
backup_gcs_credential_file = '/home/vedams/gcscinder-c406cfde1717.json'
backup_gcs_bucket = gcscinderbucket
backup_driver = cinder.backup.drivers.google
backup_gcs_project_id = 'gcscinder-322'
backup_gcs_user_agent = biarca
```

→ Restart the Cinder backup service to make the changes take effect



Backup Cinder Volumes to GCS

→ Create a Cinder volume

```
$ cinder create --name snia1\  
  --image-id 54199c6a-1ae4-4eb1-a959-fc5b796e5fc2 1
```

→ List Cinder volumes

```
$ cinder list
```

ID	Status	Name	Size	Volume Type	Bootable	Attached to
90e829aa-e410-4305-b529-d5e141c0e90f	available	snia1	1	lvmdriver-1	true	

→ Create Cinder volume backup

```
$ cinder backup-create --name bak1\  
  90e829aa-e410-4305-b529-d5e141c0e90f
```

Property	Value
id	d6c4a96b-9a9b-4ebf-aad7-2c142f65800c
name	bak1
volume_id	90e829aa-e410-4305-b529-d5e141c0e90f

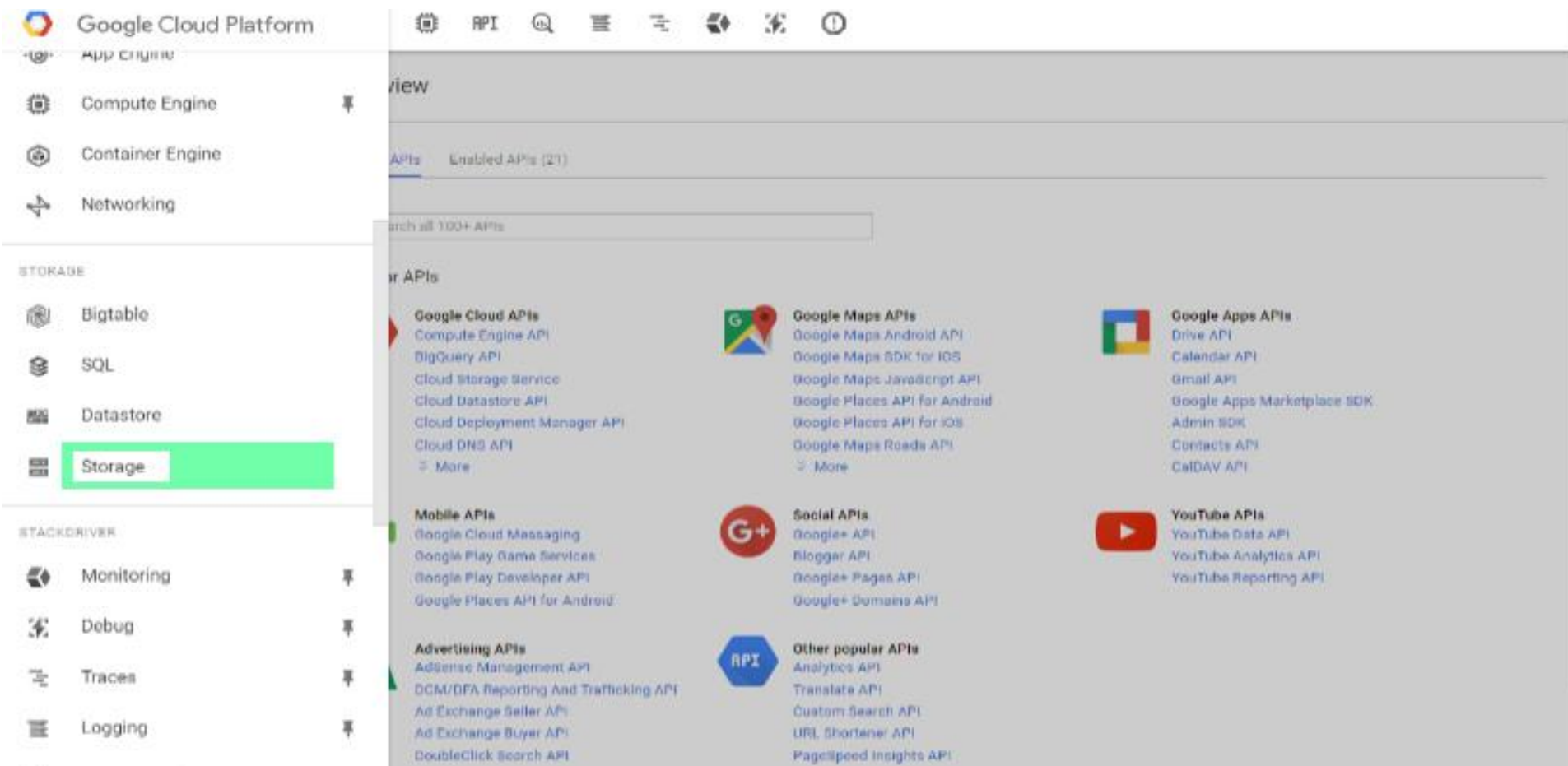
→ List Cinder volume backups

```
$ cinder backup-list
```

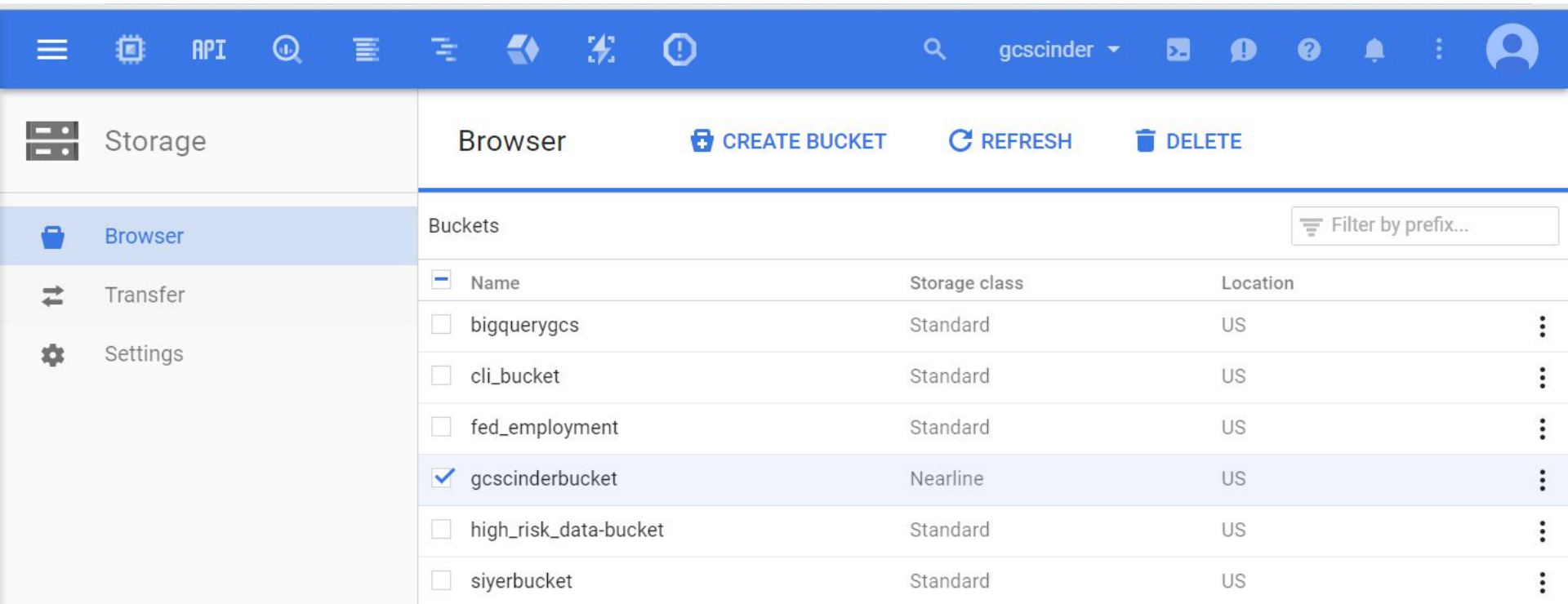
ID	Volume ID	Status	Name	Size	Object Count	Container
d6c4a96b-9a9b-4ebf-aad7-2c142f65800c	90e829aa-e410-4305-b529-d5e141c0e90f	creating	back1	1	0	gcscinderbucket

Verify Created Backups in GCS

- Login to Google developer console
- Select the project “gcscinder”
- Select the “Products & Services” tab
- Click on “Storage”



→ Select and Open “gcscinderbucket” from listed buckets



The screenshot shows the Google Cloud Storage interface. The left sidebar contains navigation options: Storage, Browser (selected), Transfer, and Settings. The main area displays a list of buckets under the 'Buckets' heading. The list has columns for Name, Storage class, and Location. The bucket 'gcscinderbucket' is selected, indicated by a blue checkmark in the Name column. Above the list, there are buttons for 'CREATE BUCKET', 'REFRESH', and 'DELETE'. A search bar with the text 'gcscinder' is visible in the top right of the main area.

Name	Storage class	Location
☐ bigquerygcs	Standard	US
☐ cli_bucket	Standard	US
☐ fed_employment	Standard	US
☒ gcscinderbucket	Nearline	US
☐ high_risk_data-bucket	Standard	US
☐ siyerbucket	Standard	US

- Backup of a Cinder volume is stored as objects having prefix: `volume_volid/timestamp/az_saz_backup_bakid` , where
 - `volid` is volume id.
 - `timestamp` is time in UTC with format of YearMonthDateHourMinuteSecond.
 - `saz` is `storage_availability_zone`.
 - `bakid` is backup id for volid.

The screenshot shows the GCS Cinder web interface. The left sidebar contains navigation links: Storage, Browser (selected), Transfer, and Settings. The main area displays the 'Browser' view for the bucket 'gcsinderbucket'. It shows a list of folders, each representing a backup. The selected folder is 'volume_90e829aa-e410-4305-b529-d5e141c0e90f/'.

Name	Size	Type	Last m
☐ volume_1eb911c0-ca4e-405a-b238-365fb09a8aeb/	—	Folder	—
☐ volume_2ef7e354-2ae3-41fe-9276-2ea74ca67b81/	—	Folder	—
☐ volume_7d865564-d65f-40b9-a2bf-205610294af6/	—	Folder	—
☒ volume_90e829aa-e410-4305-b529-d5e141c0e90f/	—	Folder	—
☐ volume_bd13a279-a738-45bd-8cab-9001ba2065e4/	—	Folder	—
☐ volume_c3aff4d0-fc75-49e1-ada6-04a9e2344ae3/	—	Folder	—
☐ volume_f4d7dcdd-81de-4904-ac87-98cb78875779/	—	Folder	—

 API

gcscinder  2

 Storage

 Browser

 Transfer

 Settings

Browser

 UPLOAD FILES

 UPLOAD FOLDER









Buckets / gcscinderbucket / volume_90e829aa-e410-4305-b529-d5e141c0e90f

☒	Name	Size	Type	Last modified
☒	 20160524054201/	—	Folder	—

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Restore Cinder Backups from GCS

→ Restore Cinder volume backup

```
vedams@nikesh:~/devstack$ cinder backup-restore d6c4a96b-9a9b-4ebf-aad7-2c142f65800c
```

Property	Value
backup_id	d6c4a96b-9a9b-4ebf-aad7-2c142f65800c
volume_id	a9c5dc86-a8c3-4bc5-9333-4764cf35bff7
volume_name	restore_backup_d6c4a96b-9a9b-4ebf-aad7-2c142f65800c

→ Check for restored backup volume

```
vedams@nikesh:~/devstack$ cinder list
```

ID	Status	Name	Size	Volume Type	Bootable	Attached to
90e829aa-e410-4305-b529-d5e141c0e90f	available	snial	1	lvmdriver-1	true	
a9c5dc86-a8c3-4bc5-9333-4764cf35bff7	available	restore_backup_d6c4a96b-9a9b-4ebf-aad7-2c142f65800c	1	lvmdriver-1	true	

Configure Cinder Backup Driver - Swift

- To enable the Ceph backup driver, include the following option in the cinder.conf file:

[DEFAULT]

backup_driver = cinder.backup.drivers.swift

- Configuration options available for the swift backup driver:

[DEFAULT]

backup_swift_container = volumebackups

backup_swift_object_size = 52428800

backup_swift_url = <http://localhost:8080/v1/AUTH>

backup_swift_auth = per_user

backup_swift_retry_attempts = 3

backup_swift_retry_backoff = 2

backup_swift_user = None

backup_swift_key = None

backup_compression_algorithm = zlib

- Restart Cinder backup service



→ List available Containers inside the Swift Storage

```
$ swift list
```

```
volumebackups
```

→ List volume backups stored inside Ceph Storage Pools

```
$ swift list volumebackups
```

```
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00001
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00002
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00003
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00004
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00005
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00006
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00007
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00008
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00009
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00010
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00011
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00012
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00013
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00014
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00015
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00016
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00017
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00018
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00019
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00020
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add-00021
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add_metadata
volume_9bc1c573-de69-486d-a4b8-2a7b001a6258/20160523134736/az_nova_backup_67abe33f-38ca-457c-9cba-4b96cd147add_sha256file
```


Configure Cinder Backup Driver- Ceph

- To enable the Ceph backup driver, include the following option in the cinder.conf file:

[DEFAULT]

backup_driver = cinder.backup.drivers.ceph

- Configuration options available for the Ceph backup driver:

[DEFAULT]

backup_ceph_pool = backup

backup_ceph_conf = /etc/ceph/ceph.conf

backup_ceph_stripe_count = 0

backup_ceph_stripe_unit = 0

backup_ceph_chunk_size = 134217728

backup_ceph_user = cinder-bak

restore_discard_excess_bytes = True

- Restart Cinder backup service

→ List available pools inside Ceph Object storage

```
$ rados ls
```

```
rbd
backup
images
vms
volumes
```

→ List available volumes

```
$ rados -p volumes ls -
```

```
rbd_data.5a6c74b0dc51.0000000000000000
rbd_id.volume-360740af-2414-4b26-8f13-8ea1bfef0582
rbd_data.5a6c74b0dc51.00000000000000002
rbd_header.5a6c74b0dc51
rbd_directory
rbd_data.5a6c74b0dc51.00000000000000004
```

→ List volume backups stored inside Ceph Object Storage Pools

```
$ rados -p backup ls -
```

```
backup.0ca2c43f-93f4-4f74-a435-653ca4e7e453.meta
```

```
rbd_id.volume-360740af-2414-4b26-8f13-8ea1bfef0582.backup.0ca2c43f-93f4-4f74-a435-653ca4e7e453
```

References

<http://gorka.eguileor.com/tag/backup/>

<http://gorka.eguileor.com/inside-cinders-incremental-backup/>

<http://www.unixarena.com/2015/10/openstack-backup-cinder-volumes-using-swift-storage.html>

http://docs.openstack.org/juno/config-reference/content/section_backup-drivers.html

<http://www.esds.co.in/kb/category/cloud-computing/>

http://docs.openstack.org/openstack-ops/content/storage_decision.html

<http://www.sparkmycloud.com/blog/cinder-block-storage-as-a-service/>

<https://github.com/openstack/cinder/blob/master/cinder/backup/drivers/google.py>



Thank You!

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Q & A

