### eSDK Cloud Storage Plugins 2.3.RC2

### FusionStorage OpenStack Driver Configuration Guide

Issue 01

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### Overview

This chapter describes the definition of Cinder Driver.

Cinder Driver is a plug-in that is deployed on the OpenStack Cinder module. The plug-in can be used to provide functions such as the logical volume and snapshot for virtual machines (VMs) in OpenStack.

## **2** Version Mappings

This chapter describes the version mappings among Cinder Driver, FusionStorage, and OpenStack.

Version mapping between OpenStack and storage products

OpenStack Version	Storage Product Version		
Mitaka/Rocky/Stein/Train/Ussuri/ Victoria/Wallaby	FusionStorage V100R006C30 FusionStorage Block 8.0.0/8.0.1		
	OceanStor Pacific series 8.1.0		

#### □ NOTE

Mitaka only supports OceanStor Pacific series 8.1.0.

Mappings among Cinder Driver, features, and the OpenStack version ( $\sqrt{}$ : supported, x: not supported)

Feature	Mitak a	Rock y	Stein	Train	Ussur	Victo ria	Wall aby
Create Volume	√	√	√	√	√	√	√
Delete Volume	√	√	√	√	√	√	√
Attach Volume	√	√	√	√	√	√	√
Detach Volume	√	√	√	√	√	√	√
Extend Volume	√	√	√	√	√	√	√
Create Snapshot	√	√	√	√	√	√	√
Delete Snapshot	√	√	√	√	√	√	√
Create Volume from Snapshot	√	√	√	√	√	√	√

Feature	Mitak a	Rock y	Stein	Train	Ussur	Victo ria	Wall aby
Create Volume from Image	√	√	√	√	√	√	√
Create Volume from Volume	√	√	√	√	√	√	√
Create Image from Volume	√	√	√	√	√	√	√
SmartThin	√	√	√	√	√	√	√
Manage/Unmanage Volume	√	√	√	√	√	√	√
Manage/Unmanage Snapshot	х	√	√	√	√	√	√
Multipath	√	√	√	√	√	√	√
QoS	√	√	√	√	√	√	√
Retype	√	√	√	√	√	√	√
iSCSI	√ (Restr icted)	√	√	√	√	√	√
SCSI	√	√	√	√	√	√	х
MultiAttach	х	√	√	√	√	√	√
Revert to Snapshot	х	√	√	√	√	√	√
Backup Volume	√	√	√	√	√	√	√
HyperMetro	х	х	x	x	х	х	х
Replication V2.1	х	х	х	х	х	х	х
HyperMetro Consistency Group	x	х	x	x	х	х	x
Backup Snapshot	х	х	х	х	х	х	х
Snapshot Consistency Group	х	х	х	х	х	х	х
Consistency Group	х	х	х	х	х	х	х

# 3 Specifications and Restrictions

Feature	Sub-feature	Description	Remarks
Mapping platform	Native OpenStack platform	OpenStack versions: Rocky/Stein/Train/Ussuri/ Victoria/Wallaby	
Configurati on	Multipathing configuration	Host multipathing: Manually install the multipathing software and enable the multipathing service.	
		OpenStack multipathing: OpenStack multipathing is disabled by default. You need to manually modify Nova and Cinder configurations.	
Policy	QoS	The priority of maxIOPS is higher than total_iops_sec.	<ul><li>maxIOPS</li><li>maxMBPS</li><li>total_iops_se</li></ul>
		The priority of maxMBPS is higher than total_bytes_sec.	c • total_bytes_s ec
		When the qos_trigger_key parameter is configured, the storage system version must be FusionStorage V100R008C00 or later.	<ul><li>qos_trigger_k ey</li></ul>

Feature	Sub-feature	Description	Remarks
		When the qos_trigger_key parameter is configured, the user role must be a super administrator.	
		When the qos_trigger_key parameter is configured, change the environment time of OpenStack to the storage system time.	

## 4 Deployment

- 4.1 Obtaining Cinder Driver
- 4.2 Deploying FusionStorage Driver for the Cinder Volume Service in Non-Containerized Mode
- 4.3 Deploying FusionStorage Driver for the Cinder Volume Service in Containerized Mode

#### 4.1 Obtaining Cinder Driver

You can obtain FusionStorage Cinder Driver in either of the following ways:

- OpenStack community warehouse. Since the Rocky version, FusionStorage Cinder Driver has been integrated into the OpenStack community warehouse. After OpenStack is installed, Cinder Driver is provided. Cinder Driver is stored in the ../cinder/cinder/volume/drivers/fusionstorage directory.
- FusionStorage OpenStack Driver warehouse
- **Step 1** Open a browser and enter <a href="https://github.com/Huawei/FusionStorage\_OpenStack\_Driver">https://github.com/Huawei/FusionStorage\_OpenStack\_Driver</a> in the address box.
- **Step 2** Click the **Download ZIP** button to download the Cinder Driver package to a local host.
- **Step 3** Decompress the package.
- **Step 4** In the decompressed directory, find the **Cinder** directory, which contains Cinder Driver of multiple OpenStack versions.

#### **□** NOTE

- After OpenStack community versions are released, new features cannot be integrated.
  The bug fixing period is long and risks exist. FusionStorage Cinder Driver warehouse
  versions ensure that new features are released and bugs are fixed in time. These
  versions are more stable than OpenStack community versions.
- The OpenStack community maintains only two stable versions. FusionStorage Cinder Driver warehouse maintains six stable versions, ensuring long-term stable running of historical versions.
- It is strongly recommended that OpenStack community versions be replaced by FusionStorage Cinder Driver warehouse versions.

### 4.2 Deploying FusionStorage Driver for the Cinder Volume Service in Non-Containerized Mode

### 4.2.1 Deploying FusionStorage Driver for the Cinder Volume Service in Non-Containerized Mode (Mitaka in SCSI Mode)

- Step 1 Log in to all OpenStack controller nodes and run the mkdir -p oceanstor\_100d\_fsc\_cli command to create the oceanstor\_100d\_fsc\_cli directory.
- Step 2 Upload OceanStor\_100D\_Fsc\_Cli\_Mitaka.tar.gz to the oceanstor\_100d\_fsc\_cli directory and run the tar zxvf OceanStor\_100D\_Fsc\_Cli\_Mitaka.tar.gz command to decompress the installation package.
- **Step 3** Run the **sh appctl.sh install** command to install fsc\_cli.
- Step 4 Copy all files in the Mitaka directory to the /usr/lib/python2.7/site-packages/cinder/volume/drivers directory. If the /usr/lib/python2.7/site-packages/cinder/volume/drivers directory does not exist, create it manually.

	$\cap$	I	J	O	Т	F
_	_		А.	${f -}$		_

Replace /usr/lib/python2.7/site-packages/cinder/volume/drivers with the actual path.

Step 5 Change the owner of the dsware.py and fspythonapi.py files in the /usr/lib/ python2.7/site-packages/cinder/volume/drivers directory to root:root and the permission on them to 644.

**chown root:root** /usr/lib/python2.7/site-packages/cinder/volume/drivers/dsware.py **chown root:root** /usr/lib/python2.7/site-packages/cinder/volume/drivers/fspythonapi.py **chmod 644** /usr/lib/python2.7/site-packages/cinder/volume/drivers/dsware.py **chmod 644** /usr/lib/python2.7/site-packages/cinder/volume/drivers/fspythonapi.py

- **Step 6** Make configuration by referring to **5 Configuring Basic Properties**.
- **Step 7** After configuration, restart the Cinder-Volume service by running the following command:

systemctl restart openstack-cinder-volume.service

**Step 8** Check the status of service restart by running the **cinder service-list** command. If **State** is **up**, the Cinder-Volume service has been restarted.

root@redhat:/# cinder service-list								
+   Binary Reason	•	Host	Zone   Status   State	Updated_at	Disabled			



----End

### 4.2.2 Deploying FusionStorage Driver for the Cinder Volume Service in Non-Containerized Mode (Others)

**Step 1** Before installation, delete all the installation files of Huawei OpenStack Driver. The default installation path is /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage.

#### □ NOTE

On the host, the version of Python is 2.7. If another version is used, use the correct version number. You can obtain the Cinder Driver installation directory by running the following commands:

```
# python -c "from cinder.volume import drivers; print (drivers.__path__)"
['/usr/lib/python2.7/site-packages/cinder/volume/drivers']
```

As shown above is the directory of all drivers. So the fusionstorage driver installation directory is as follows:

/usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage

If the directory does not exist, create it manually. And change the owner the permission of the directory:

mkdir -p /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage chown root:root /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage chmod 755 /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage

#### □ NOTE

Replace /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage with the actual path

**Step 2** Copy OpenStack Cinder Driver to the Cinder Driver installation directory. The default installation path is described in **Step 1**.

```
# ls -l
-rw-r--r- 1 root root 1138 May 15 08:23 constants.py
-rw-r--r- 1 root root 22174 May 15 08:23 dsware.py
-rw-r--r- 1 root root 18880 May 15 08:23 fs_client.py
-rw-r--r- 1 root root 4799 May 15 08:23 fs_conf.py
-rw-r--r- 1 root root 14419 May 15 08:23 fs_flow.py
-rw-r--r- 1 root root 2248 May 15 08:23 fs_qos.py
-rw-r--r- 1 root root 2988 May 15 08:23 fs_utils.py
-rw-r--r- 1 root root 0 May 15 08:23 __init__.py
```

- **Step 3** Make configuration by referring to **5 Configuring Basic Properties**.
- **Step 4** After configuration, restart the Cinder-Volume service by running the following command:

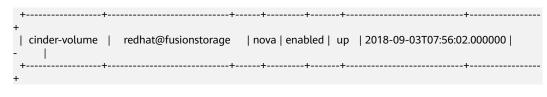
systemctl restart openstack-cinder-volume.service

**Step 5** Check the status of service restart by running the **cinder service-list** command. If **State** is **up**, the Cinder-Volume service has been restarted.

```
root@redhat:/# cinder service-list

+-----+

+ Binary | Host | Zone | Status | State | Updated_at | Disabled Reason |
```



----End

### 4.3 Deploying FusionStorage Driver for the Cinder Volume Service in Containerized Mode

**Step 1** (Optional) Run the **docker save** command to back up the Cinder Volume container image.

**MOTE** 

To obtain the image version, run the docker image ls command.

**Step 2** Run the following command to create temporary directory **build** in any directory and go to the created directory:

# mkdir \*\*\*/build;cd \*\*\*/build

**Step 3** Run the following commands to copy the obtained FusionStorage Driver code files to the current directory:

```
# ls -l
-rw-rw-r-- 1 root root 1138 May 15 08:23 constants.py
-rw-rw-r-- 1 root root 22174 May 15 08:23 dsware.py
-rw-rw-r-- 1 root root 18880 May 15 08:23 fs_client.py
-rw-rw-r-- 1 root root 4799 May 15 08:23 fs_conf.py
-rw-rw-r-- 1 root root 14419 May 15 08:23 fs_flow.py
-rw-rw-r-- 1 root root 2988 May 15 08:23 fs_utils.py
-rw-rw-r-- 1 root root 0 May 15 08:23 __init__.py
```

**Step 4** Create the **Dockerfile** file in the current directory and edit the following content:

FROM \*\*\*:\*\*\*
COPY \*.py /fusionstorage/cinder/driver/path/

#### 

- Replace \*\*\*\*\*\*\*\*\* with the name and version of the original Cinder Volume container image.
- Replace /fusionstorage/cinder/driver/path with the path of Driver in the container. You can obtain the Cinder Driver code directory by running the following commands:
   # python -c "from cinder.volume import drivers; print (drivers.\_\_path\_\_)"
   ['/usr/lib/python2.7/site-packages/cinder/volume/drivers']
- As shown above is the directory of all drivers. So the fusionstorage driver installation directory is as follows:
  - /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage
- If the directory does not exist, create it manually. And change the owner the permission
  of the directory:

mkdir -p /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage chown root:root /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage chmod 755 /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage

■ NOTE

Replace /usr/lib/python2.7/site-packages/cinder/volume/drivers/fusionstorage with the actual path

#### **Step 5** Run the following command to build an image:

docker build -t \*\*\*:\*\*\* .

#### □ NOTE

Replace \*\*\*:\*\*\* with the name and version of the original Cinder Volume container image.

- **Step 6** Make configuration by referring to **5 Configuring Basic Properties**.
- **Step 7** Restart the Cinder Volume container.

## 5 Configuring Basic Properties

This chapter describes how to configure the FusionStorage Cinder Driver.

- 5.1 Configuring the conf File (Mitaka in SCSI Mode)
- 5.2 Configuring the conf File (Others)
- 5.3 Configuring Host Multipathing (iSCSI Mode)
- 5.4 Configuring OpenStack Multipathing (iSCSI Mode)
- 5.5 Configuring the QoS Property

#### 5.1 Configuring the conf File (Mitaka in SCSI Mode)

Step 1 Configure /etc/cinder/cinder.conf.

Modify the **enabled\_backends**, **dsware\_manager**, and **fusionstorageagent** fields under **[DEFAULT]**. The following is an example:

```
[DEFAULT]
enabled_backends=fusionstorage_8_scsi
dsware_manager = 192.168.211.99
fusionstorageagent = 192.168.211.82,192.168.211.85,192.168.211.86
```

Add the following fields to the end of the file:

```
[fusionstorage_8_scsi]
volume_backend_name = fusionstoragescsi
volume_driver = cinder.volume.drivers.dsware.DSWARELocalDriver
pool_id_list = 0,1
over_ratio = 3.0
manager_ips=
node1.hw.com:192.168.160.177,
node2.hw.com:192.168.160.178
```

Table 5-1 describes the parameters in the configuration file.

Table 5-1 Parameter description

Parameter	Description
enabled_backe nds	Name of the storage node that needs to take effect in the system. For example, <b>fusionstorage_8_scsi</b> .
	If multiple storage nodes need to take effect, separate their names with commas (,).
dsware_manag er	Floating IP address of FusionStorage.
fusionstoragea gent	Management IP address of the OpenStack compute node (VBS) used for the communication between OpenStack and FusionStorage. If there are multiple IP addresses, separate them using commas (,).
volume_backe nd_name	Name of the back-end storage for the volume. For example, fusionstoragescsi.
volume_driver	Path of the storage system driver. The value is fixed to cinder.volume.drivers.dsware.DSWARELocalDriver.
pool_id_list	Storage pool list.  This parameter specifies the storage pool where the volume is created. If there are multiple storage pools, you can use this parameter to create volumes in the storage pool with the specified ID.
over_ratio	Thin provisioning ratio. In thin provisioning mode, you can set the storage overcommitment rate. You can set this parameter to 1 or higher. If you do not set this parameter, default value 1 is used. 3.0 or higher is recommended.  This parameter is optional.
manager_ips	Host name of OpenStack and the management IP address used for creating a VBS. Multiple IP addresses are separated by commas (,) and line breaks. The information about the last VBS is not followed by a comma (,).
	In this example, <b>node1.hw.com</b> is the host name of OpenStack, and <b>192.168.160.177</b> is the management IP address displayed for a VBS after the VBS is created for the OpenStack node.

#### **Step 2** Test the connectivity of fsc\_cli.

Run the following command:

#### fsc\_cli --op getDSwareIdentifier --manage\_ip x.x.x.x --ip y.y.y.y

x.x.x.x indicates the floating IP address of FusionStorage, and y.y.y.y indicates the IP address of a VBS node.

#### 5.2 Configuring the conf File (Others)

At the end of /etc/cinder/cinder.conf, configure the FusionStorage back end with DSWAREDriver. volume\_driver indicates the loaded driver file, volume\_backend\_name indicates the name of the back end, each row of manager\_ips indicates the name and IP address of an FSA host, dsware\_rest\_url indicates the IP address of a storage array, san\_login and san\_password are the login information of the storage array, and dsware\_storage\_pools indicates the storage pool name on the storage array. For details, see Table 5-2.

■ NOTE

Ensure that both the owner and user group of /etc/cinder/cinder.conf are cinder.

-rw-r--r-- 1 cinder cinder 2839 Aug 29 15:29 cinder.conf

**Step 1** Add the FusionStorage back end. Configure parameters for the back end according to **Table 5-2**.

[fusionstorage]

volume\_driver = cinder.volume.drivers.fusionstorage.dsware.DSWAREDriver

volume\_backend\_name = fusionstorage

manager\_ips =
 node1.hw.com:192.168.160.177,
 node2.hw.com:192.168.160.178

dsware\_rest\_url = https://x.x.x.x:28443

san\_login= xxx

san\_password = xxx

dsware\_storage\_pools = xxx1;xxx2;xxx3

target\_ips = x.x.x.y.y.y.y

iscsi\_manager\_groups = x.x.x.x1;x.x.x.x2,x.x.x.x3;x.x.x.x4

use\_ipv6 = False

force\_delete\_volume = False

**MOTE** 

If the iSCSI mode is used, **volume\_driver** needs to be set to **cinder.volume.drivers.fusionstorage.dsware.DSWAREISCSIDriver**.

[fusionstorage]
...
volume\_driver = cinder.volume.drivers.fusionstorage.dsware.DSWAREISCSIDriver

**Step 2** In the **[DEFAULT]** area, configure the FusionStorage back end.

[DEFAULT]
...
enabled\_backends=fusionstorage

Step 3 If the Cinder Volume service is deployed on multiple nodes, you need to configure a distributed lock in the [coordination] area. For details about <user>, <password>, <host>, and <database>, see the value of connection under [database] in the configuration file.

[coordination] backend\_url = mysql://<user>:<password>@<host>/<database>?charset=utf8

For example, [database] in the configuration file is configured as follows:

[database] connection = mysql+pymysql://cinder:302824058e9a4f31@127.0.0.1/cinder

Then configure [coordination] as follows:

[coordination] backend\_url = mysql://cinder:302824058e9a4f31@127.0.0.1/cinder

Table 5-2 Parameter description

Parameter	Description	Mandatory
volume_backe nd_name	Back end name of the default driver.	Yes
volume_driver	Default driver.	Yes
dsware_rest_ur l	URL and port number used by the Cinder node to access FusionStorage (If the management IP address of FusionStorage is an IPv6 IP address, configure https://[ipv6_ip]:28443, where ipv6_ip is the management IPv6 IP address of FusionStorage).	Yes
san_login	User name used by the Cinder node to access FusionStorage.	Yes
san_password	Password used by the Cinder node to access FusionStorage.	Yes
dsware_storag e_pools	Names of existing storage pools on FusionStorage.	Yes
manager_ips	Management host name and its corresponding IP address. ':' is preceded by a host name, and followed by the corresponding host IP address. Each host is separated using commas (,). Add spaces at the start of each row.	Mandatory when selecting the SCSI mode
scan_device_ti meout	Timeout for scanning disks when the iSCSI mode is selected. The default value is <b>3</b> , the type is Int, and the unit is seconds.	Mandatory when selecting the SCSI mode
target_ips	Management IP addresses of nodes when the iSCSI mode is selected. They are separated by commas (,). You must specify either target_ips or iscsi_manager_groups.	Conditionall y mandatory when selecting the iSCSI mode

Parameter	Description	Mandatory
iscsi_manager_ groups	IP address group formed by management IP addresses when the iSCSI mode is selected. IP addresses in an IP address group are separated by semicolons (;), and IP address groups are separated by commas (,). You must specify either target_ips or iscsi_manager_groups.	Conditionall y mandatory when selecting the iSCSI mode
use_ipv6	Whether to use an IPv6 address as the service IP address. The default value is <b>False</b> .	Optional when selecting the SCSI mode
force_delete_v olume	Whether to forcibly delete a volume that has been mapped during volume deletion. The value can be <b>True</b> (yes) or <b>False</b> (no). The default value is <b>False</b> . This parameter is optional.	No

#### 

Only 8.0.1.5 SPH503, 8.1.0, and later versions support **iscsi\_manager\_groups**. Only 8.0.1.5 SPH502, 8.1.0, and later versions support **use\_ipv6**.

#### 5.3 Configuring Host Multipathing (iSCSI Mode)

Multipathing is configured to improve the link reliability of LUNs of SAN storage. If the multipathing configuration is incorrect, an I/O error occurs when a single link is faulty. As a result, the VM file system is read-only or faulty, affecting VM service delivery. When configuring multipathing, install the multipathd service on the host and configure proper parameters. Then, configure multipathing parameters on OpenStack.

#### 5.3.1 Installing the Multipathing Tool Package

**Step 1** Install the Multipath tool package based on the operating system.

#### CentOS:

yum install -y device-mapper-multipath

#### Ubuntu:

apt-get install -y multipath-tools apt-get install -y multipath-tools-boot

**Step 2** Enable the host multipathing service.

#### CentOS:

/sbin/mpathconf --enable systemctl start multipathd.service

```
systemctl enable multipathd.service
systemctl restart multipathd.service

Ubuntu:
systemctl restart multipath-tools.service
----End
```

#### 5.3.2 Configuring the Multipathing Service

Add the following content to the **devices** field in the multipathing configuration file (/etc/multipath.conf). For details, see the Configuring Multipathing for an Application Server (Red Hat or CentOS) on OceanStor 100D.

```
devices {
  device {
          vendor
                               "Huawei"
          product
                               "VBS fileIO"
          path_grouping_policy
                                   multibus
          path_checker
                                 tur
          prio
                             const
          path selector
                                 "service-time 0"
          failback
                              immediate
          no_path_retry
                                 "10"
      }
```

After the configuration is complete, restart the multipathd service.

systemctl restart multipathd.service

#### 5.4 Configuring OpenStack Multipathing (iSCSI Mode)

#### 5.4.1 Configuring Multipathing for OpenStack Nova Nodes

**Step 1** Configure the /etc/nova/nova.conf file.

Add volume\_use\_multipath = True in [libvirt] of /etc/nova/nova.conf.

If "/etc/nova/nova-cpu.conf" exists in the Nova Compute node, add "volume\_use\_multipath = True" to its [libvirt].

**Step 2** Restart the nova-compute service.

systemctl restart openstack-nova-compute.service

----End

#### 5.4.2 Configuring Multipathing for OpenStack Cinder Nodes

**Step 1** Add the following content to the end of **BACKEND** in the /etc/cinder/cinder.conf file:

```
[fusionstorage]
...
use_multipath_for_image_xfer = true
enforce_multipath_for_image_xfer = true
```

**Step 2** Restart the cinder-volume service.

systemctl restart openstack-cinder-volume.service

----End

#### 5.5 Configuring the QoS Property

QoS in OpenStack mainly depends on front-end Hypervisor and back-end storage.

For details about how to configure front-end QoS, see https://docs.openstack.org/cinder/

latest/admin/blockstorage-basic-volume-qos.html.

This section describes how to configure back-end QoS for Huawei storage devices.

**Step 1** Run the following command to create a volume type. <name> indicates the name of the volume type.

# cinder type-create <name>

**Step 2** Run the following command to enable QoS. <vtype> indicates the volume type name configured in **Step 1**.

# cinder type-key <vtype> set capabilities:QoS\_support='<is> true'

**Step 3** Run the following command to create a QoS specification. <name> indicates the name of a customized QoS specification.

# cinder qos-create <name> <qos\_key>=\*\*\* <qos\_trigger\_key>=\*\*\*

**Table 5-3** qos\_key parameters

Parameter	Description	Remarks	Mandatory
maxIOPS	Maximum IOPS.	The value is a positive integer. The default value is 999999999.	No, but one must be specified. The priority of maxIOPS is
maxMBPS	Maximum bandwidth.	The value is a positive integer, expressed in MB/s. The default value is 999999.	higher than total_iops_sec; the priority of maxMBPS is higher than total_bytes_sec.
total_iops_sec	Maximum IOPS.	The value is a positive integer. The default value is 999999999.	,
total_bytes_sec	Maximum bandwidth.	The value is a positive integer, expressed in byte/s. The default value is 999999 * 1024 * 1024.	

**Table 5-4** qos\_trigger\_key parameters

Parameter	Description	Remarks	Mandatory
scheduleType	QoS triggered policy type.	Available values are: 0 (always), 1 (one-off), 2 (daily), and 3 (weekly). The default is 0 when not set.	No
startDate	QoS triggered start date.	Not earlier than the current date, the format of the date is: "xx-xx-xx". Such as "2019-06-01".	Yes when the scheduleType is not 0
startTime	QoS triggered start time.	In 24-hour format, the time format is: "xx-xx", such as "08:00".	Yes when the scheduleType is not 0
durationTime	QoS daily duration.	The configuration range is 30 minutes to 24 hours. The format is: "xx:xx", for example "24:00", "0:30".	Yes when the scheduleType is not 0
dayOfWeek	QoS weekly effective date.	Available values are: "Mon", "Tue", "Wed", "Thur", "Fri", "Sat", "Sun", which means Monday to Sunday respectively. Support for configuring multiple parameters, separated by spaces. For example, "Mon Tue Thur Sun" means that QoS will take effect on Monday, Tuesday, Thursday and Sunday.	Yes when the scheduleType is 3

**Step 4** Associate the QoS specification with the volume type. <qos\_specs> indicates the QoS specification ID created in **3** and <volume\_type\_id> indicates the volume type ID created in **Step 1**.

# cinder qos-associate <qos\_specs> <volume\_type\_id>

**Step 5** Use the volume type in **Step 1** to create a volume.

#### ----End

#### ■ NOTE

- When the **qos\_trigger\_key** parameter is configured, the storage system version must be FusionStorage V100R008C00 or later.
- When the **qos\_trigger\_key** parameter is configured, the user role must be a super administrator.
- When the **qos\_trigger\_key** parameter is configured, change the environment time of OpenStack to the storage system time.

 $\mathbf{6}$  faq

6.1 Failed to Create a Volume from an Image When verify\_glance\_signatures Is Set to enabled

6.2 Failed to Create a VM on the Specified Host If iscsi\_manager\_groups Is Used When the iSCSI Network Is Used to Connect to Distributed Storage

6.3 When the SCSI Network Is Used to Connect to Distributed Storage, the number of concurrent I/Os to disks on VMs is limited to less than 64.

### 6.1 Failed to Create a Volume from an Image When verify\_glance\_signatures Is Set to enabled

#### **Symptom**

OpenStack creates a volume from an image. After the image is copied for a period of time, the following error message is displayed: Failed to copy metadata to volume: Glance metadata cannot be updated, key signature\_verified exists for volume id b75f957c-0ba4-4099-8706-866c68012779. As a result, the volume fails to be created.

#### **Environment**

Operating system: CentOS 7.6

Server: Huawei 5288 V5OpenStack version: Rocky

#### **Root Cause**

BUG Link: https://bugs.launchpad.net/cinder/+bug/1823445

In Rocky and later versions, the **verify\_glance\_signatures** field is added to **cinder.image.glance.py**. Its default value is **enabled**. When **verify\_glance\_signatures** in the **cinder.conf** file is **disabled** and **signature\_verification** exists in the image, the DB API does not allow repeated writing of **signature\_verification** and reports an exception.

#### Workaround

In the **[DEFAULT]** area of the **cinder.conf** file, set **verify\_glance\_signatures** to **disabled**. The following is an example:

[DEFAULT] ... verify\_glance\_signatures = disabled

## 6.2 Failed to Create a VM on the Specified Host If iscsi\_manager\_groups Is Used When the iSCSI Network Is Used to Connect to Distributed Storage

#### **Symptom**

After **iscsi\_manager\_groups** is configured, OpenStack mounts volumes to a VM. At the beginning, the mounting is successful. However, volumes cannot be mounted to VMs from a certain time point, the Cinder driver does not report any error logs, and the iSCSI-based link fails to be established.

The target IP address returned to the Nova host from the Cinder volume log is obtained. On the Nova host, the **ping** *x.x.x.x* command is executed to check the IP address connectivity. In addition, whether the **iscsiadm** command can be used to establish a link is checked. The target IP address failed to be pinged from the host.

#### **Environment**

Operating system: CentOS 7.6

Server: Huawei 5288 V5

OpenStack version: Pike and later

#### **Root Cause**

The data plane network between the Nova host and storage device is faulty.

#### Workaround

Rectify the data plane network fault and deliver a new VM.

## 6.3 When the SCSI Network Is Used to Connect to Distributed Storage, the number of concurrent I/Os to disks on VMs is limited to less than 64.

#### **Symptom**

When the SCSI network is used to connect to distributed storage, and the management plane is normal. However, on the service plane, the I/O size of the VM is limited to less than 64, and the VM cannot be pressed.

#### **Environment**

The Mode of OpenStack Networking: SCSI

#### **Root Cause**

The disk need to use libvirt for virtualization after mapping to a host machine, and then need to be generated a configuration file. When the SCSI network is used, the Nova does not have the "driver\_io = native" configuration item. As a result, the disk I/O mode is threads (default), affecting the concurrent size.

#### Workaround

1. On each Nova node, add conf.driver\_io = "native" to the get\_config method of LibvirtVolumeDriver in nova.virt.libvirt.volume.volume.py.

2. Restart the nova-compute service.

systemctl restart openstack-nova-compute.service

## **7** Appendix

7.1 Appendix 1: Configuring Volume-backend image

7.2 Appendix 2: Configuring Image-Volume Cache

#### 7.1 Appendix 1: Configuring Volume-backend image

This function is provided by the native OpenStack platform. It is used to store images in the storage backend of Cinder to accelerate the speed of creating volumes from images. Official link: https://docs.openstack.org/cinder/stein/admin/blockstorage-volume-backed-image.html

**Step 1** Edit the /etc/glance/glance-api.conf file and complete the following configurations:

Configure Cinder as the storage backend of glance and configure the following content in [glance store]:

```
[glance_store]
...
stores = file,http,swift,cinder
default_store = cinder
```

Configure **show\_multiple\_locations** in [DEFAULT] to parse the locations URL information of Cinder.

```
[DEFAULT]
...
show_multiple_locations = True
```

**Step 2** Edit the /etc/cinder/cinder.conf file and complete the following configurations:

Configure **allowed\_direct\_url\_schemes** and **glance\_api\_version** to use Cinder as the backend of glance.

```
[DEFAULT]
...
glance_api_version=2
allowed_direct_url_schemes = cinder
```

Configure **image\_upload\_use\_cinder\_backend** at the backend, for example, [fusionstorage].

[fusionstorage]

image\_upload\_use\_cinder\_backend = True

**Step 3** After the preceding configuration is complete, restart the cinder and glance services.

systemctl restart openstack-glance-\* systemctl restart openstack-cinder-\*

----End

#### 7.2 Appendix 2: Configuring Image-Volume Cache

This function is provided by the native OpenStack platform. Image volume cache can significantly improve the performance of creating EVS disks from images. Official link: https://docs.openstack.org/cinder/stein/admin/blockstorage-image-volume-cache.html

**Step 1** Obtain the project ID, for example, admin.

# openstack project list | grep admin | 366d9f386ecd4defb91df5b0830e7267 | admin |

Step 2 Obtain a Cinder user ID.

# openstack user list | grep cinder | 1b2a016cb4a74326a469834dfbc7a841 | cinder

**Step 3** Edit the /etc/cinder/cinder.conf file.

Add cinder\_internal\_tenant\_project\_id and cinder\_internal\_tenant\_user\_id to [DEFAULT].

[DEFAULT]

cinder\_internal\_tenant\_project\_id = 366d9f386ecd4defb91df5b0830e7267 cinder\_internal\_tenant\_user\_id = 1b2a016cb4a74326a469834dfbc7a841

Configure **image\_volume\_cache\_enabled** at the backend, for example, [fusionstorage].

[fusionstorage]

•••

image\_volume\_cache\_enabled = True

**Step 4** After the preceding configuration is complete, restart the cinder and glance services.

systemctl restart openstack-cinder-\*