FusionStorage OpenStack Driver

Configuration Guide

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1 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
Pike Queens Rocky Stein	FusionStorage V100R006C30 FusionStorage V100R008C00

NOTE

Queens only supports iSCSI protocol.

You can query the version mapping table of eSDK plug-ins to obtain the storage system versions. To obtain the version mapping table, log in to **http://support.huawei.com/enterprise/en/index.html**. In the search box, enter **eSDK Cloud Storage Plugins** to search for and download the *eSDK Cloud Storage Plugins x.x.xxx Version Mapping*. *x.x.xxx* indicates the version number.

Mappings among Cinder Driver, features, and the OpenStack version (√ : supported, x: not supported)

Feature	Pike	Queens	Rocky	Stein
Create Volume	√	√	√	√
Delete Volume	√	√	√	√
Attach Volume	√	√	√	√
Detach Volume	√	√	√	√
Extend Volume	√	√	√	√

Feature	Pike	Queens	Rocky	Stein
Create Snapshot	√	√	√	√
Delete Snapshot	√	√	√	√
Create Volume from Snapshot	√	√	√	√
Create Volume from Image	√	√	√	√
Create Volume from Volume	√	√	√	√
Create Image from Volume	√	√	√	√
SmartThin	√	√	√	√
Manage/Unmanage Volume	√	√	√	√
Manage/Unmanage Snapshot	√	√	√	√
Multipath	√	√	√	√
QoS	√	√	√	√
Retype	√	√	√	√
iSCSI	√	√	√	√
SCSI	x	x	√	√
SmartCache	x	x	x	x
SmartThick	x	x	x	x
SmartPartition	x	x	x	x
HyperMetro	x	x	x	x
Replication V2.1	x	x	x	x
HyperMetro Consistency Group	x	x	x	x
Backup Snapshot	x	x	x	x
Snapshot Consistency Group	x	x	x	x
Consistency Group	x	x	x	x

3 Deployment

To obtain the operating systems supported by FusionStorage Block 6.3, access **http://support-open.huawei.com/en/**, choose **Interoperability Center** > **Storage Interoperability**, set **Storage System** to **FusionStorage** and **Storage Service Type** to **Block**, and select the desired operating system. The following uses Red Hat as an example to describe how to deploy Cinder Driver.

3.1 Obtaining Cinder Driver

Two ways to obtain FusionStorage OpenStack Driver:

- OpenStack community warehouse. Since Rocky, Huawei has contributed Huawei Storage Driver to OpenStack, so that users can download FusionStorage OpenStack Driver from the OpenStack community for free. After installing the specified OpenStack version, FusionStorage OpenStack Driver will be placed under directory *../cinder/cinder/volume/drivers/fusionstorage*. If you cannot find the corresponding installation files, you can download FusionStorage OpenStack Driver from the OpenStack community warehouse at **https://github.com/openstack/cinder**.
- Huawei OpenStack Driver warehouse. By visiting **https://github.com/Huawei/FusionStorage_OpenStack_Driver**, you can download FusionStorage OpenStack Driver that corresponds to OpenStack community version.

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

Red Hat OpenStack deployment steps are as follows:

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:

```
root@redhatL004:~# find / -name dsware.py
/usr/lib/python2.7/dist-packages/cinder/volume/drivers/fusionstorage/dsware.py
```

Step 2 Copy OpenStack Cinder Driver to the Cinder Driver installation directory.

Step 3 Make configuration by referring to **4 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 |
  +------------------+-----------------------------+------+---------+-------
+-------------------------+-----------------+
  |  cinder-volume   |  r  edhat@fusionstorage     | nova | enabled |  up   |
2018-09-03T07:56:02.000000 |        -        |
  +------------------+-----------------------------+------+---------+-------
+-------------------------+-----------------+
```

----End

3.3 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.

NOTE

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/
```

NOTE

- Replace ***:*** with the name and version of the original Cinder Volume container image.
- Replace */fusionstorage/cinder/driver/path* with the path of Huawei Driver in the container.

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 **4 Configuring Basic Properties**.

Step 7 Restart the Cinder Volume container.

----End

4 Configuring Basic Properties

This chapter describes how to configure the FusionStorage Cinder Driver.

4.1 Configuring a conf File

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 an FSM, **san_login** and **san_password** are the login information of the FSM, and **dsware_storage_pools** indicates the storage pools name on the FSM. For details, see **Table 4-1**.

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 4-1**.

```
[fusionstorage]
volume_driver = cinder.volume.drivers.fusionstorage.dsware.DSWAREDriver
volume_backend_name = fusionstorage
manager_ips =
    xx: x.x.x.x,
    xx: x.x.x.x
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.x
```


NOTE

Once ISCSI mode is used, "volume_driver" needs to be configured as "cinder.volume.drivers.fusionstorage.dsware.DSWAREISCSIDriver"

[fusionstorage]

...

volume_driver = cinder.volume.drivers.fusionstorage.dsware.DSWAREISCSIDriver

...

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

```
[DEFAULT]
 ...
enabled_backends = fusionstorage
```

----End

4.2 conf Configuration File Parameters

Table 4-1 Parameter description

Parameter	Description	Mandatory
volume_backend_name	Back end name of the default driver.	Yes
volume_driver	Default driver.	Yes
dsware_rest_url	URL and port number used by the Cinder node to access 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_storage_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 IP host is separated using commas (,). Add spaces at the start of each row.	Yes when selecting SCSI mode
target_ips	Default IP address of the iSCSI target port IP(the FSA node IP configured with the service IP) provided for compute nodes by the storage device.	Yes when selecting iSCSI mode

4.3 Configuring iSCSI Multipathing

Step 1 Configure multiple IP addresses in the **target_ips** item of the Cinder Driver conf, and separate them with a comma (,).

```
[fusionstorage]
 ...
 target_ips = x.x.x.x,y.y.y.y
```

Step 2 Enable multipathing for the OpenStack Nova module.

Add **volume_use_multipath = True** in **[libvirt]** of **/etc/nova/nova.conf**.

NOTE

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

Step 3 Restart the nova-compute service.

----End

4.4 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 thevolume 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 4-2 qos_key parameters

Parameter	Description	Remarks	Mandatory
maxIOPS	Maximum IOPS.	The value is a positive integer.	Yes
maxMBPS	Maximum bandwidth.	The value is a positive integer, expressed in MB/s.	Yes
minBaselineIOPS	Minimum IOPS.	The value is a positive integer.	No

Parameter	Description	Remarks	Mandatory
minBaselineMBPS	Minimum bandwidth.	The value is a positive integer, expressed in MB/s.	No

Table 4-3 qos_trigger_key parameters

Parameter	Description	Remarks	Mandatory
scheduleType	QoS triggered policy type.	Available values are: 0(Always), 1(Oneoff), 2(Daily), 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

Parameter	Description	Remarks	Mandatory
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 version is required to be FusionStorage V100R008C00 or later.

When configuring the qos_trigger_key parameter, the user role is required to be a super administrator.

