**RED HAT ENTERPRISE LINUX OPENSTACK PLATFORM 7 DELL STORAGECENTER BACK END GUIDE**

RED HAT ENTERPRISE LINUX OPENSTACK PLATFORM**7**

**A GUIDE TO USING DELL STORAGECENTER STORAGE IN A RHEL OPENSTACK PLATFORM ENVIRONMENT**

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**Abstract**

This document describes how to configure OpenStack to use one or more Dell StorageCenter back ends.

**CHAPTER 1. INTRODUCTION**

This document describes how to configure OpenStack to use one or more Dell StorageCenter back ends. It also includes instructions on addressing volume size discrepancies between Dell StorageCenter and the OpenStack Block Storage service.

The following chapters assume that:

* Only covers **Dell Storage Center ISCSI drivers**
* OpenStack has already been deployed with a properly-configured Block Storage service
* A Dell StorageCenter Group with Dell Enterprise Manager is already deployed and accessible
* No other back end is configured aside from the Dell StorageCenter devices
* You have the necessary credentials for connecting to the Enterprise manager and Dell StorageCenter Group
* You have the username and password of an admin account for the OpenStack deployment (see "User and Role Management" in the *Users and Identity Management Guide*, or [Creating additional OpenStack admin users](https://access.redhat.com/articles/1247413) for more information)

**CHAPTER 2. USE A SINGLE DELL STORAGECENTER BACK END FOR OPENSTACK BLOCK STORAGE**

This section describes how to configure OpenStack to use a single Dell StorageCenter device as a Block Storage back end.

**2.1. DEFINE THE BACK END**

In a deployment that uses a single back end, the settings for the back end are defined in the[DEFAULT] section. The following snippet displays the different settings required for using a Dell StorageCenter SAN device (in this case, the device is named dell\_sc\_iscsi):

[DEFAULT]

​volume\_driver=**cinder.volume.drivers.dell\_storagecenter\_iscsi.DellStorageCenterISCSIDriver** 1

​volume\_backend\_name= dell\_sc\_iscsi

​​san\_ip=**10.1.1.1** 2

​san\_login=**Admin** 3

​san\_password=**password** 4

​iscsi\_ip\_address=192.168.0.20 5

dell\_sc\_ssn=64702 6

dell\_sc\_api\_port=3033 7

dell\_sc\_server\_folder=server\_folder 8

dell\_sc\_volume\_folder=volume\_folder9

iscsi\_port=326010

[**1**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-1)

**volume\_driver**: The ISCSI volume driver required for Dell StorageCenter back ends (namely,cinder.volume.drivers.dell\_storagecenter\_iscsi.DellStorageCenterISCSIDriver).

[**2**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-3)

**san\_ip**: The IP address used to reach the Dell Enterprise Manager. This field has no default value.

[**3**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-4)

**san\_login**: The user name to login to the Dell Enterprise Manager at the san\_ip. The default user name is Admin.

[**4**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-5)

**san\_password**: The corresponding password of san\_login. Default password is password.

[**5**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-6)

**iscsi\_ip\_address**: The Dell Storage Center ISCSI IP address to create volumes and snapshots.

[**6**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-7)

**​dell\_sc\_ssn**: The Dell Storage Center serial number to use. Default is 64702.

[**7**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-8)

**dell\_sc\_api\_port**: The Dell Enterprise Manager API port. It’s optional and defaults to 3033.

[**8**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-9)

**​dell\_sc\_server\_folder**: The Server folder in Dell Storage Center where the new server definitions are placed

[**9**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-9)

**​ dell\_sc\_volume\_folder**: The Server folder in Dell Storage Center where the new volumes are created.

[**10**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO1-9)

**​ iscsi\_port**: The ISCSI port of the Dell Storage Center array. It’s optional and defaults to 3036.

**NOTE**

**2.2. LOAD THE NECESSARY ADMINISTRATOR CREDENTIALS**

As you will be performing administrative functions from this point onwards, you will need to load the necessary environment variables to facilitate authentication. To do so, run the following commands:

# export OS\_USERNAME=*ADMIN\_USER*# export OS\_TENANT\_NAME=admin# export OS\_PASSWORD=*ADMIN\_PW*# export OS\_AUTH\_URL=http://*KEYSTONE\_IP*:35357/v2.0/# export PS1='[\u@\h \W(keystone\_admin)]\$

Where:

* *ADMIN\_USER* and *ADMIN\_PW* are the username/password of a user account with administrative rights within the OpenStack environment.
* *KEYSTONE\_IP* is the IP address or hostname of the Identity service.

For more information about OpenStack admin accounts, see [Creating additional OpenStack admin users](https://access.redhat.com/articles/1247413).

**2.3. CREATE A VOLUME TYPE AND RESTART BLOCK STORAGE SERVICE**

After defining the back end, create a volume type for it. The following commands will create the volume type lvm and map it to the back end dell\_sc\_iscsi (from [Define the Back End](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#be-single-define-be)):

# cinder type-create dell\_sc\_backend

# cinder type-key dell-sc\_backend set volume\_backend\_name=dell\_sc\_iscsi

Then, restart the Block Storage service:

# systemctl restart openstack-cinder-volume

**2.4. TEST YOUR CONFIGURATION**

Verify your configuration by creating a 1GB volume named test\_backend. To do so:

# cinder create --volume\_type dell\_sc\_backend --display\_name test\_backend 1

**CHAPTER 3. USE MULTIPLE DELL STORAGECENTER BACK ENDS FOR OPENSTACK BLOCK STORAGE**

This section describes how to configure OpenStack to use multiple Dell StorageCenter devices as Block Storage back ends.

**3.1. DEFINE EACH BACK END**

Start by creating a section for each back end in the /etc/cinder/cinder.conf file of the node hosting the openstack-cinder-volume service. The following snippet defines two back ends,[backend1] and [backend2]:

[backend1]

​volume\_driver=**cinder.volume.drivers.dell\_storagecenter\_iscsi. DellStorageCenterISCSIDriver** 1

​volume\_backend\_name=**backend1** 2

​san\_ip=**10.1.1.1** 3

​san\_login=**Admin** 4

​san\_password=**password** 5

​iscsi\_ip\_address=192.168.0.20 6

dell\_sc\_ssn=64702 7

dell\_sc\_api\_port=3033 8

dell\_sc\_server\_folder=server\_folder 9

dell\_sc\_volume\_folder=volume\_folder10

iscsi\_port=326011

​

​[backend2]

​volume\_driver=**cinder.volume.drivers. dell\_storagecenter\_iscsi. DellStorageCenterISCSIDriver** 12

​volume\_backend\_name=**backend1** 13

​san\_ip=**10.1.1.1** 14

​san\_login=**Admin** 15

​san\_password=**password** 16

​iscsi\_ip\_address=192.168.0.20 17

dell\_sc\_ssn=64702 18

dell\_sc\_api\_port=3033 19

dell\_sc\_server\_folder=server\_folder 20

dell\_sc\_volume\_folder=volume\_folder21

iscsi\_port=326022

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[**1**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**1**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)**2**

**volume\_driver**: The ISCSI volume driver required for Dell StorageCenter back ends (namely,cinder.volume.drivers.dell\_storagecenter\_iscsi.DellStorageCenterISCSIDriver).

[**2**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**1**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)**3**

**volume\_backend\_name**: Defines each back end’s name. Each back end must have a unique name.

[**3**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**1**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)**4**

**san\_ip**: The IP address used to reach the Dell Enterprise Manager. This field has no default value.

[**4**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**1**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)**5**

**san\_login**: The user name to login to the Dell Enterprise Manager at the san\_ip. The default user name is Admin.

[**5**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**1**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)**6**

**san\_password**: The corresponding password of san\_login. Default password is password.

[**6**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**1**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)**7**

**iscsi\_ip\_address**: The Dell Storage Center ISCSI IP address to create volumes and snapshots.

[**[2](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide" \l "CO1-7)**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)**[7](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide" \l "CO1-7)**[**[1](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide" \l "CO1-7)**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)**[8](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide" \l "CO1-7)**

**​dell\_sc\_ssn**: The Dell Storage Center serial number to use. Default is 64702.

[**8**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**19**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)

**dell\_sc\_api\_port**: The Dell Enterprise Manager API port. It’s optional and defaults to 3033.

[**9**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**20**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)

**​dell\_sc\_server\_folder**: The Server folder in Dell Storage Center where the new server definitions are placed

[**10**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**21**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)

**​ dell\_sc\_volume\_folder**: The Server folder in Dell Storage Center where the new volumes are created.

[**11**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-2)[**22**](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#CO2-12)

**​ iscsi\_port**: The ISCSI port of the Dell Storage Center array. It’s optional and defaults to 3036.

**​**

**3.2. LOAD THE NECESSARY ADMINISTRATOR CREDENTIALS**

As you will be performing administrative functions from this point onwards, you will need to load the necessary environment variables to facilitate authentication. To do so, run the following commands:

# export OS\_USERNAME=*ADMIN\_USER*

# export OS\_TENANT\_NAME=admin

# export OS\_PASSWORD=*ADMIN\_PW*

# export OS\_AUTH\_URL=http://*KEYSTONE\_IP*:35357/v2.0/

# export PS1='[\u@\h \W(keystone\_admin)]\$

Where:

* *ADMIN\_USER* and *ADMIN\_PW* are the username/password of a user account with administrative rights within the OpenStack environment.
* *KEYSTONE\_IP* is the IP address or hostname of the Identity service.

For more information about OpenStack admin accounts, see [Creating additional OpenStack admin users](https://access.redhat.com/articles/1247413).

**3.3. CONFIGURE THE VOLUME SERVICE**

1. After defining each back end, configure the volume service to use each of them. To do so, set the defined back ends as a comma-delimited list to the enabled\_backends setting in the[DEFAULT] section of /etc/cinder/cinder.conf. For example, to set backend1 and backend2 (from [Define Each Back End](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#be-multi-define-be)) as your back ends, run:

# openstack-config --set /etc/cinder/cinder.conf DEFAULT enabled\_backends backend1,backend2

1. Next, declare a *volume type* for each back end. Later on, when you create a volume, you can use the volume type to specify which back end the Block Storae service should use for creating the volume. The following commands will allow you to create two volume types: dell\_sc\_iscsi1 and dell\_sc\_iscsi2:

# cinder type-create dell\_sc\_iscsi1

# cinder type-create dell\_sc\_iscsi2

Likewise, map the iscsi2volume type to backend2 (also from [Define Each Back End](https://access.redhat.com/documentation/en/red-hat-enterprise-linux-openstack-platform/version-7/dell-equallogic-back-end-guide#be-multi-define-be)):

1. Configure the Block Storage service to intelligently determine which back end to use for a specific request:

# openstack-config --set /etc/cinder/cinder.conf DEFAULT scheduler\_default\_filters CapacityFilter

With this, the Block Storage service will choose from the configured back ends based on each one’s capacity.

1. Enable thin provisioning for SAN volumes:

# openstack-config --set /etc/cinder/cinder.conf DEFAULT san\_thin\_provision true

1. Restart the Block Storage service:

# systemctl restart openstack-cinder-volume

**3.4. TEST YOUR CONFIGURATION**

Verify your configuration by creating a 1GB volume backed by backend2 and namedtest\_backend2:

# cinder create --volume\_type dell\_sc\_iscsi2 --display\_name test\_backend2 1