

# Configure multiple-storage back ends

« (blockstorage-nfs-backend.html) » (blockstorage-backup-disks.html) 🐞 (https://bugs.launchpad.net/cinder/+filebug?field.title=Configure%20multiple-storage%20back%20ends%20in%20Cinder&field.comment=%0A%0A%0AThis bug tracker is for errors with the documentation, use the following as a template and remove or add fields as you see fit. Convert [ ] into [x] to check boxes:%0A%0A- [ ] This doc is inaccurate in this way: \_\_\_\_%0A- [ ] This is a doc addition request.%0A- [ ] I have a fix to the document that I can paste below including example: input and output. %0A%0AIf you have a troubleshooting or support issue, use the following resources:%0A%0A - Ask OpenStack: http://ask.openstack.org%0A - The mailing list: http://lists.openstack.org%0A - IRC: 'openstack' channel on Freenode%0A%0A-----%0ARelease:%2012.0.1.dev9%20on%202018-03-08%2015:24%0ASHA:%20ca6e2fb1fb74150680bff605a241947fc88ddd51%0ASource:%20https://git.openstack.org/cgit/openstack/cinder/tree/doc/source/admin/blockstorage-multi-backend.rst%0AURL: https://docs.openstack.org/cinder/queens/admin/blockstorage-multi-backend.html&field.tags=doc)

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When you configure multiple-storage back ends, you can create several back-end storage solutions that serve the same OpenStack Compute configuration and one **cinder-volume** is launched for each back-end storage or back-end storage pool.

In a multiple-storage back-end configuration, each back end has a name (**volume\_backend\_name**). Several back ends can have the same name. In that case, the scheduler properly decides which back end the volume has to be created in.

The name of the back end is declared as an extra-specification of a volume type (such as, **volume\_backend\_name=LVM**). When a volume is created, the scheduler chooses an appropriate back end to handle the request, according to the volume type specified by the user.

## Enable multiple-storage back ends

To enable a multiple-storage back ends, you must set the **enabled\_backends** flag in the **cinder.conf** file. This flag defines the names (separated by a comma) of the configuration groups for the different back ends: one name is associated to one configuration group for a back end (such as, **[lvmdriver-1]**).

### Note

The configuration group name is not related to the **volume\_backend\_name**.

### Note

After setting the **enabled\_backends** flag on an existing cinder service, and restarting the Block Storage services, the original **host** service is replaced with a new host service. The new service appears with a name like **host@backend**. Use:

```
$ cinder-manage volume update_host --currenthost CURRENTHOST --newhost CURRENTHOST@BACKEND
```

to convert current block devices to the new host name.

The options for a configuration group must be defined in the group (or default options are used). All the standard Block Storage configuration options (**volume\_group**, **volume\_driver**, and so on) might be used in a configuration group. Configuration values in the **[DEFAULT]** configuration group are not used.

These examples show three back ends:

```
enabled_backends=lvmdriver-1,lvmdriver-2,lvmdriver-3
[lvmdriver-1]
volume_group=cinder-volumes-1
volume_driver=cinder.volume.drivers.lvm.LVMVolumeDriver
volume_backend_name=LVM
[lvmdriver-2]
volume_group=cinder-volumes-2
volume_driver=cinder.volume.drivers.lvm.LVMVolumeDriver
volume_backend_name=LVM
[lvmdriver-3]
volume_group=cinder-volumes-3
volume_driver=cinder.volume.drivers.lvm.LVMVolumeDriver
volume_backend_name=LVM_b
```

In this configuration, **lvmdriver-1** and **lvmdriver-2** have the same **volume\_backend\_name**. If a volume creation requests the **LVM** back end name, the scheduler uses the capacity filter scheduler to choose the most suitable driver, which is either **lvmdriver-1** or **lvmdriver-2**. The capacity filter scheduler is enabled by default. The next section provides more information. In addition, this example presents a **lvmdriver-3** back end.

### Note

For Fiber Channel drivers that support multipath, the configuration group requires the **use\_multipath\_for\_image\_xfer=true** option. In the example below, you can see details for HPE 3PAR and EMC Fiber Channel drivers.

```
[3par]
use_multipath_for_image_xfer = true
volume_driver = cinder.volume.drivers.hpe.hpe_3par_fc.HPE3PARFCDriver
volume_backend_name = 3parfc

[emc]
use_multipath_for_image_xfer = true
volume_driver = cinder.volume.drivers.emc.emc_smis_fc.EMCSMISFCDriver
volume_backend_name = emcfc
```

## Configure Block Storage scheduler multi back end¶

You must enable the *filter\_scheduler* option to use multiple-storage back ends. The filter scheduler:

1. Filters the available back ends. By default, **AvailabilityZoneFilter**, **CapacityFilter** and **CapabilitiesFilter** are enabled.
2. Weights the previously filtered back ends. By default, the *CapacityWeigher* option is enabled. When this option is enabled, the filter scheduler assigns the highest weight to back ends with the most available capacity.

The scheduler uses filters and weights to pick the best back end to handle the request. The scheduler uses volume types to explicitly create volumes on specific back ends. For more information about filter and weighing, see [Configure and use driver filter and weighing for scheduler \(blockstorage-driver-filter-weighing.html#filter-weigh-scheduler\)](#).

## Volume type¶

Before using it, a volume type has to be declared to Block Storage. This can be done by the following command:

```
$ openstack --os-username admin --os-tenant-name admin volume type create lvm
```

Then, an extra-specification has to be created to link the volume type to a back end name. Run this command:

```
$ openstack --os-username admin --os-tenant-name admin volume type set lvm \
  --property volume_backend_name=LVM_iSCSI
```

This example creates a **lvm** volume type with **volume\_backend\_name=LVM\_iSCSI** as extra-specifications.

Create another volume type:

```
$ openstack --os-username admin --os-tenant-name admin volume type create lvm_gold

$ openstack --os-username admin --os-tenant-name admin volume type set lvm_gold \
  --property volume_backend_name=LVM_iSCSI_b
```

This second volume type is named **lvm\_gold** and has **LVM\_iSCSI\_b** as back end name.

### Note

To list the extra-specifications, use this command:

```
$ openstack --os-username admin --os-tenant-name admin volume type list --long
```

### Note

If a volume type points to a **volume\_backend\_name** that does not exist in the Block Storage configuration, the **filter\_scheduler** returns an error that it cannot find a valid host with the suitable back end.

## Usage¶

When you create a volume, you must specify the volume type. The extra-specifications of the volume type are used to determine which back end has to be used.

```
$ openstack volume create --size 1 --type lvm test_multi_backend
```

Considering the **cinder.conf** described previously, the scheduler creates this volume on **lvmdriver-1** or **lvmdriver-2**.

```
$ openstack volume create --size 1 --type lvm_gold test_multi_backend
```

This second volume is created on **lvmdriver-3**.

