

## 1.3.2. Dell EqualLogic volume driver

The Dell EqualLogic volume driver interacts with configured Dell EqualLogic Groups and supports various operations, such as:

- Volume creation and deletion
- Volume attachment and detachment
- Snapshot creation and deletion
- Clone creation

The OpenStack Block storage service supports multiple instances of Dell EqualLogic Groups or Dell EqualLogic Group Storage Pools, and/or multiple pools on a single array, simultaneously.

The Dell EqualLogic volume driver's ability to access the EqualLogic Group is dependent upon the generic block storage driver's SSH settings in the `cinder.conf` file. See section 1.5, "Block Storage Sample Configuration Files".

### 1.3.2.1 Default (Single Instance) Configuration

To configure and use a single Dell EqualLogic Group with Block Storage, modify your `cinder.conf` file as follows.

- Set the `volume_driver` option to `cinder.volume.drivers.eqlx.DellEQLSanISCSIDriver` (the Dell EqualLogic volume driver).
- Set the `san_ip` option to the IP address used to reach the EqualLogic Group through SSH. There is no default value.
- Set the `san_login` option to the user name to login to the Group manager via SSH at the `san_ip`. Default user name is `grpadmin`.
- Set the `san_password` option to the password to login to the Group manager via SSH at the `san_ip`. Not used when `san_private_key` is set. Default password is `password`.
- Set the `eqlx_group_name` option to the group to be used for a pool where cinder will create volumes and snapshots. Default group is `group-0`.
- Set the `eqlx_pool` option to the pool where cinder will create volumes and snapshots. Default pool is `default`. This option cannot be used for multiple pools utilized by Cinder on a single Dell EqualLogic Group.
- Optionally set the `san_private_key` option to the filename of the private key used for SSH authentication. This provides password-less login to the EqualLogic Group. Not used when `san_password` is set. There is no default value.

- Optionally set the `ssh_min_pool_conn` option to the minimum number of SSH connections in the pool. Default minimum number is 1.
- Optionally set the `ssh_max_pool_conn` option to the maximum number of SSH connections in the pool. Default maximum number is 5.
- Optionally set the `san_thin_provision` option to `true` to enable creation of thin-provisioned volumes. Default value is `false`.
- Optionally set the `eqlx_use_chap` option to use CHAP authentication for each volume in a pool. Default value is `false`.
- Optionally set the `eqlx_chap_login` option to the CHAP login account for each volume in a pool, if `eqlx_use_chap` is set to `true`. Default account name is `chapadmin`.
- Optionally set the `eqlx_chap_password` option to the CHAP login account password to be used for each volume in a pool, if `eqlx_use_chap` is set to `true`. The default password is randomly generated in hexadecimal, so you must set this password manually.
- Optionally set the `eqlx_cli_timeout` option to the timeout value, in seconds, for CLI commands. Default timeout value is 30.
- Optionally set the `eqlx_cli_max_retries` option to the maximum CLI retries. Default is 5.
- Optionally set the `san_ssh_port` option to the port used for SSH. Default port is 22.
- Optionally set the `ssh_conn_timeout` to the timeout value, in seconds, used by CLI commands over SSH. Default timeout value is 30.

### Sample Default Configuration

```
[DEFAULT]
#Required options
volume_driver=cinder.volume.drivers.eqlx
san_ip=<IP_address_of_EQLX>
san_login=<user_name>
san_password=<password>
eqlx_group_name=<group_name>
eqlx_pool=<pool_name>

#Non-required options
san_thin_provision=<true|false>
eqlx_use_chap=<true|false>
eqlx_chap_login=<user_name>
eqlx_chap_password=<password>
eqlx_cli_timeout=30
eqlx_cli_max_retries=5
san_ssh_port=22
ssh_conn_timeout=30
san_private_key=<filename>
ssh_min_pool_conn=1
```

```
ssh_max_pool_conn=5
```

### 1.3.2.2 Multiple Instance Configuration

When using multiple Dell EqualLogic backends, uncomment the `enabled_backends` flag. The default (single instance) configuration is not used. List all of the options in the single instance configuration in sections for each backend. Title each section for one of the names listed in `enabled_backends`. The section titles are enclosed in brackets.

- Set the `enabled_backends` option to a comma-separated list of the names of the backends that you wish to use. Default is `none`.
- Set the `volume_backend_name` option to the name of the Dell EqualLogic volume.

#### Sample Multi-Backend Configuration

```
#enabled_backends is required to be set for multiple backends.

enabled_backends=backend1,backend2
san_ssh_port=22
ssh_conn_timeout=30

[backend1]
#Required options
volume_driver=cinder.volume.drivers.eqlx.DellEQLSanISCSIDriver
volume_backend_name=backend1san_ip=<IP_address_of_EQLX1>
san_login=<user_name>
san_password=<password>
eqlx_group_name=<group_name>
eqlx_pool=<pool_name>

#Non-required options
san_thin_provision=<true|false>
eqlx_use_chap=<true|false>
eqlx_chap_login=<user_name>
eqlx_chap_password=<password>
eqlx_cli_timeout=30
eqlx_cli_max_retries=5
san_private_key=<filename>
ssh_min_pool_conn=1
ssh_max_pool_conn=5

[backend2]
#Required options
volume_driver=cinder.volume.drivers.eqlx.DellEQLSanISCSIDriver
volume_backend_name=backend2
san_ip=<IP_address_of_EQLX2>
```

```
san_login=<user_name>
san_password=<password>
eqlx_group_name=<group_name>
eqlx_pool=<pool_name>

#Non-required options
san_thin_provision=<true|false>
eqlx_use_chap=<true|false>
eqlx_chap_login=<user_name>
eqlx_chap_password=<password>
eqlx_cli_timeout=30
eqlx_cli_max_retries=5
san_private_key=<filename>
ssh_min_pool_conn=1
ssh_max_pool_conn=5
```