



**NetApp Element**

# **CLI Tools User Guide**

Version 1.7

November 2020 | 215-15172\_A0  
doccomments@netapp.com

 **NetApp**<sup>®</sup>

# Contents

**CLI Tools overview..... 4**

- Installing CLI Tools..... 4
- Using CLI Tools: Examples..... 5
- Using CLI Tools with nonstandard options..... 6
- Options..... 7
- Output formats overview..... 7
- Enabling autocomplete..... 10
- Accessing embedded help..... 10
- Managing connections..... 10
- Enabling debug messages..... 11

**List of commands..... 14**

- API command..... 14
- Account commands..... 14
- Async command..... 17
- Backup target commands..... 17
- Cluster administrator commands..... 18
- Cluster commands..... 22
- Drive commands..... 33
- Hardware information commands..... 35
- IdP commands..... 37
- Initiator commands..... 39
- Lightweight Directory Access Protocol (LDAP) commands..... 42
- Link Layer Discovery Protocol (LLDP) commands..... 45
- Logging session commands..... 45
- Network commands..... 46
- Node commands..... 47
- Pairing commands..... 53
- Restart commands..... 55
- Schedule commands..... 56
- Security commands..... 57
- Sensor commands..... 62
- Service command..... 62
- SnapMirror commands..... 63
- Snapshot commands..... 80
- snmp commands..... 87
- SSH commands..... 90
- Storage container commands..... 91
- Test commands..... 92
- Virtual network commands..... 94
- Virtual volume commands..... 97
- Volume commands..... 99
- Volume access group commands..... 116

**Where to find product documentation and other information ..... 119**

**Contacting NetApp Support..... 120**

**Copyright..... 121**

**Trademark..... 122**

**How to send comments about documentation and receive update notifications.... 123**

## CLI Tools overview

---

This document introduces CLI Tools and provides information about the prerequisites for using it, software components that it supports, and how to install and use it. It also lists the functions available in CLI Tools, and provides instructions for accessing inline help, managing connections, executing commands with standard and nonstandard parameters, and executing unsupported API methods.

**Note:** Starting in release 1.6, Solidfire Element OS is now NetApp Element.

CLI Tools is for users who want to control their SolidFire cluster from a command line. It also provides programmatic control of the system via scripts. From the command-line interface, you can execute commands that are based on the API methods supported by NetApp Element version 9.0 and later. You can choose to get the responses to the commands in any of the following formats:

- JSON
- Pickle

CLI Tools also includes an inline help system that provides more information about the commands.

### Support matrix

Refer to the *CLI Tools Release Notes* to view the supported software and operating systems for this release.

## Installing CLI Tools

Install the NetApp Element Python SDK and the NetApp Element CLI Tools to use the commands in this guide.

### Before you begin

You must have Python installed to install CLI Tools.

**Note:** If you are a Linux user, you have to set up a virtual environment before you install CLI Tools. To set up the virtual environment, run the following command:

```
pip install virtualenv
virtualenv pythoncli
source pythoncli/bin/activate
```

This activates the virtual environment.

CLI Tools depend on NetApp Element Python SDK.

You can install the NetApp Element Python SDK from the [NetApp Support Site](#).

### Steps

1. Download the `solidfire-sdk-python-<version number>.tar.gz` from the [NetApp Support Site](#).
2. Unzip the downloaded file into your directory.
3. Navigate to the `solidfire-sdk-python` directory:

```
cd solidfire-sdk-python
```
4. Run the following command to install the Element Python SDK:

```
python setup.py install
```

5. To use the Element Python SDK in other Python scripts, append the SolidFire directory location to your `PYTHONPATH` environment variable:

```
export PYTHONPATH=$PYTHONPATH:/path/to/solidfire-sdk-python/
```

After you do this, you can use the following method to install CLI Tools.

6. Search for the tool on the [NetApp Support Site](#).
7. Download the `solidfire-sdk-cli-<version number>.tar.gz` file.
8. Navigate to the directory which contains the `.tar.gz` file and run the following command to install CLI Tools:

```
easy_install solidfire-sdk-cli-<version number>.tar.gz
```

## Using CLI Tools: Examples

This section includes examples of using CLI Tools to perform common cluster operations, such as creating volumes and creating accounts. For detailed descriptions of the command options, see the embedded help.

### Creating a new account

To create a new account in the system, use the command as shown in the following example:

```
sfcli Account add --username abc123
```

This command is based on the `AddAccount` API method, and creates a new account in the system. The `username` option is mandatory for this command. The value should be unique, between 1 and 64 characters in length. The value specified above ("abc123") is an example.

The following options are optional for this command:

- `initiatorsecret`: The secret for CHAP authentication for the initiator. The value must be between 12 and 16 characters in length, and should be impenetrable.
- `targetsecret`: The secret for CHAP authentication for the target. The value must be between 12 and 16 characters in length, and should be impenetrable.
- `attributes`: List of name-value pairs in JSON object format.

### Creating a new volume

You can create new volumes under the new account you created. To create a new volume, use the command as shown in the following example:

```
sfcli Volume create --name xyz456 --accountid 289 --totalsize 1000000000 --enable512e true
```

This command is based on the `CreateVolume` API method, and creates a new volume on the cluster. The following options are mandatory for this command:

- `name`: Name of the volume; between 1 to 64 characters in length. It is best if the name is unique. In the example given above, `name` is specified as "xyz456."
- `accountid`: Account ID for the owner of the volume. In the example given above, `accountid` is specified as "289."
- `totalsize`: Total size of the volume, in bytes. In the example given above, `totalsize` is specified as "1000000000."
- `enable512e`: Default value is false, which specifies that 512e emulation is not enabled. If you set the value to true, the volume provides 512 byte sector emulation. In the example given above, `enable512e` is set to "true."

The following options are optional with this command:

- `attributes`: List of name-value pairs in JSON object format.

- `qos`: Initial quality of service settings for this volume. Default values are used, if you do not specify any values. Valid settings are `minIOPS`, `maxIOPS`, and `burstIOPS`.

### Getting details about an account

To get details about an account, use the command as shown in the following example:

```
sfcli -c 0 Account GetByID --accountid 3065
```

**Note:** The account ID provided in the command above is an example.

This command is based on the `GetAccountByID` API method, and returns details about a specific account (3065, in the above example). You should specify the `accountid` option for this command.

The output for the above command is as follows:

```
account:
  attributes:
    target_secret:
      secret: q7788;0a:Cd0xCE4
    initiator_secret:
      secret: r0Jul}t:02"5p<L^
  status: active
  account_id: 3065
  username: example
  volumes:
```

### Adding drives to a cluster

To add one or more available drives to a cluster, use the following command in the CLI:

```
sfcli Drive add <options>
```

This command is based on the `AddDrives` API method. When you add a node to the cluster or install new drives in an existing node, the new drives are marked as "available" and must be added before they can be utilized. When you add multiple drives, it is more efficient to add them in a single `AddDrives` method call. This reduces the amount of data balancing that must occur to stabilize the storage load on the cluster. When you add a drive, the system automatically determines the type of drive it should be. The method is asynchronous and returns immediately. However, it can take some time for the data in the cluster to be rebalanced using the newly added drives.

## Using CLI Tools with nonstandard options

In some cases, you input options in JSON format directly to the command-line interface. There are two such "nonstandard" options. They are called `parameters` and `attributes`. In the inline help for these two parameters, a JSON object will be requested.

The following example shows the command syntax for making a call directly to the API:

```
$account = sfcli -c 0 SFApi Invoke --method GetAccountByID --parameters "{\"accountID\": 94}"
```

**Note:** In the above example, `parameters` is a "nonstandard" option, for which the value has been specified as a JSON string.

## Options

This section lists the options that you can use in CLI Tools.

Option	Description	Type
-m, --mvip	The management virtual IP address of the cluster.	Text
-u, --username	The username for the cluster.	Text
-p, --password	The password for the cluster.	Text
-v, --version	The version of the cluster to which you want to connect.	Text
-q, --port	The port number on which you want to connect to the cluster.	Integer
-n, --name	The name of the connection you want to use in <code>connections.csv</code> . You can use this option, if you have a stored connection.	Text
-c --connectionindex	The index of the connection you want to use in <code>connections.csv</code> . You can use this option, if you have a stored connection.	Integer
-s --verifyssl	Enable this to check the SSL connection for errors when using a host name in the target. It is invalid to set this to True when using an IP address in the target.	Boolean
-t --timeout	Specify the request timeout, in seconds.	Integer
-j, --json	Displays the output in JSON format.	N/A
-k, --pickle	Displays the output in pickled JSON format.	N/A
--debug [0 1 2 3]	The debug level that you want to set.	N/A
--help	Displays the inline help.	N/A

## Output formats overview

When you run commands in CLI Tools, you can choose to obtain output in JSON or pickle format.

### JSON format

The output in this format resembles the output of the API. This format is useful if you want to save the data for later use with Postman or if you want to import it using JSON libraries. To get your output in this format, use the `-j` option after `sfcli` in your command. See the following sample:

```
{
  "accounts": [
    {
      "attributes": {},
      "initiator_secret": {
        "secret": "3,gG[sP02V'@911]"
      },
      "volumes": [
```

```

    4588
  ],
  "target_secret": {
    "secret": "aAe6Bb&q]63zU0Ei"
  },
  "status": "active",
  "account_id": 2404,
  "username": "XYZ",
  "storage_container_id": {
    "hex": "00000000000000000000000000000000"
  }
},
{
  "attributes": {},
  "initiator_secret": {
    "secret": "haxecliisgmB"
  },
  "volumes": [],
  "target_secret": {
    "secret": "haxecliLUuvO9s"
  },
  "status": "active",
  "account_id": 2405,
  "username": "haxecliFV8QdeT6fn5DxtvFuYzjsFwWtclYzXfT5-
NQE5pHiQAQBelnqVskTsJY8",
  "storage_container_id": {
    "hex": "00000000000000000000000000000000"
  }
},
{
  "attributes": {},
  "initiator_secret": {
    "secret": "haxecli7tOAtk"
  },
  "volumes": [],
  "target_secret": {
    "secret": "haxecliXFty4F2"
  },
  "status": "active",
  "account_id": 2406,
  "username":
"haxeclij0yA7YVfCDiq9jZXdkdiKfkSytk2flKk9Gi9NFq0677Fcg44QIDc9inqF",
  "storage_container_id": {
    "hex": "00000000000000000000000000000000"
  }
}
]

```

**Pickle format**

This is the default output format. The output in this format is similar to the JSON format, except that there is an extra object type field for every object. This format is useful if you want to save data for use later with a Python SDK. To get your output in this format, use the `-k` option after `sfcli` in your command. See the following sample:

```

{
  "py/object": "solidfire.models.ListAccountsResult",
  "accounts": [
    {
      "account_id": 2404,

```





```
    }  
  }  
]  
}
```

## Enabling autocomplete

You can set up CLI Tools to complete the command syntax automatically for you.

### Step

Do either of the following to use the autocomplete feature:

- Copy and paste the following syntax in your `.bashrc` file:

```
eval "$(_SFCLI_COMPLETE=source sfcli)"
```

Entering the syntax in your `.bashrc` file enables you to use the feature every time you open a new terminal window.

- Enter the following syntax in your command prompt when you want to use the feature:

```
eval "$(_SFCLI_COMPLETE=source sfcli)"
```

## Accessing embedded help

CLI Tools includes an inline help that you can access through the command line. Help content includes details about how to use the commands. You can also see the version of CLI Tools from the help output.

### Step

To access inline help, enter the following command:

```
sfcli --help
```

See the following examples for different levels at which you can access inline help:

- To access inline help for an object (for example, `account`), enter the following command:

```
sfcli account --help
```

- To access inline help for a specific command (for example, `getbyid`), enter the following command:

```
sfcli account getbyid --help
```

## Managing connections

You can use commands in CLI Tools to manage connections to a SolidFire storage cluster. This section lists the commands that you can use to manage connections and provides some examples.

- To execute a command on a connection without storing it, use the `mvip`, `login`, and `password` options, as in the following example:

```
sfcli --mvip 10.117.60.15 --login admin --password admin Account List
```

If you do not store the connection, you need to enter your credentials every time you execute a command.

- To store a connection, use `Connection Push` and the `name` option, as in the following example:

```
sfcli --mvip 10.117.60.15 --login admin --password admin --name "Example" Connection Push
```

**Note:** If you do not specify a name, the connection name gets set from the name of the cluster or node.

When you store a connection, your credentials are saved locally in an encrypted form. This ensures that you do not need to enter your credentials every time you run a command.

- To use a stored connection, do the following:
  - Use `-n` or `--name` to find the connection by name, as in the following example:

```
sfcli -n Example Account List # by name
```

- Use `connection 0` to use the default, as in the following example:

```
sfcli Account List # use connection 0
```

- To remove a connection, use the `Connection Remove` command as follows:
  - Use `-n` or `--name` to remove a connection by name, as in the following example:

```
sfcli Connection Remove -n Example
```

- To list the stored connections, use the `Connection List` command as follows:

```
sfcli Connection List
```

- To prune a broken connection from the `connection.csv` file, use the `Connection Prune` command as follows:

```
sfcli Connection Prune
```

## Enabling debug messages

You can use the `debug` option in CLI Tools to enable debug messages. Debug messages provide information about the request that you sent to the system. This information will help you understand command errors. You also need this information if you have to contact NetApp Support.

You can specify the debug level by choosing from one of the following values:

- 0: Critical logging. Displays only errors.
- 1: Warning logging. Displays errors and warnings.
- 2: Info logging. Displays errors, warnings, and information.
- 3: Debug logging. Displays errors, warnings, information, and debug information.

To set the debug level, specify the `debug` option in your command as shown in the following example:

```
sfcli --debug 2 account list
```

In the above example, the debug level specified is 2, which returns the following response:

```
in cmd_account.py at 494 - INFO: : startaccountid = None;limit =  
None;includestoragecontainers = None;  
{  
  "id": 1,  
  "result": {  
    "accounts": [  
      {  
        "accountID": 85,  
        "attributes": {},  
        "initiatorSecret": "QK%.Xv9dDHg,5LDQ",
```

```
        "status": "active",
        "storageContainerID": "00000000-0000-0000-0000-000000000000",
        "targetSecret": "7N9@g*7u0[znA*q?",
        "username": "ElementCLISDK",
        "volumes": []
    },
    {
        "accountID": 86,
        "attributes": {},
        "initiatorSecret": "A2l#^8z9Q8?3mAz",
        "status": "active",
        "storageContainerID": "00000000-0000-0000-0000-000000000000",
        "targetSecret": "b10PCEkfj&A20]h<",
        "username": "ElementCLISDK_1",
        "volumes": []
    }
]
}
```

You might want to save the above output. To save the information from the server, use the following command:

```
sfcli --debug 2 account list 2> info.txt
```

info.txt will include only the following text labeled "INFO" in the above sample response:

```
in cmd_account.py at 494 - INFO: : startaccountid = None;limit =
None;includestoragecontainers = None;
```

To save the response from the server, use the following command:

```
sfcli --debug 2 account list > data.txt
```

data.txt will include the following text labeled "accounts" in the above sample response:

```
{
  "id": 1,
  "result": {
    "accounts": [
      {
        "accountID": 85,
        "attributes": {},
        "initiatorSecret": "QK%.Xv9dDHg,5LDQ",
        "status": "active",
        "storageContainerID": "00000000-0000-0000-0000-000000000000",
        "targetSecret": "7N9@g*7u0[znA*q?",
        "username": "ElementCLISDK",
        "volumes": []
      },
      {
        "accountID": 86,
        "attributes": {},
        "initiatorSecret": "A2l#^8z9Q8?3mAz",
        "status": "active",
        "storageContainerID": "00000000-0000-0000-0000-000000000000",
        "targetSecret": "b10PCEkfj&A20]h<",
        "username": "ElementCLISDK_1",
        "volumes": []
      }
    ]
  }
}
```

```
}  
  }  
  ]
```

## List of commands

---

This section lists all the commands that you can use in the tool and their descriptions.

### API command

You can use the command in this section to invoke any API method that is supported by the Element API for the version and port that the connection is using.

**sfcli SFApi invoke** <options>

Description	Options
<p>You can use this command to invoke any API method supported by the Element API for the version and port the connection is using. The command returns a nested hashtable of key-value pairs that contain the result of the invoked method.</p>	<p><b>method:</b> The name of the method to invoke. This is case sensitive.</p> <p><b>parameters:</b> An object, normally a dictionary or hashtable of the key-value pairs, to be passed as the parameters for the method being invoked.</p>

### Account commands

This section describes the account-related commands that you can use in CLI Tools.

**sfcli Account add** <options>

Description	Options
<p>This command enables you to add a new account to the system. You can create new volumes under the new account. The CHAP settings you specify for the account apply to all volumes owned by the account.</p>	<p><b>attributes:</b> List of name-value pairs in JSON object format.</p> <p><b>initiatorsecret:</b> The CHAP secret to use for the initiator. This secret must be 12-16 characters in length and should be impenetrable. The initiator CHAP secret must be unique and cannot be the same as the target CHAP secret. If unspecified, a random secret is created.</p> <p><b>targetsecret:</b> The CHAP secret to use for the target (mutual CHAP authentication). This secret must be 12-16 characters in length and should be impenetrable. The target CHAP secret must be unique and cannot be the same as the initiator CHAP secret. If unspecified, a random secret is created.</p> <p><b>username:</b> Specifies the username for this account. (Might be 1 to 64 characters in length).</p>

**sfcli Account getbyid** <options>

Description	Options
<p>This command enables you to return details about a specific account, given its <code>accountId</code>.</p>	<p><b>accountId:</b> Specifies the account for which details are gathered.</p>

**sfcli Account getbyname <options>**

Description	Options
This command enables you to retrieve details about a specific account, given its username.	username: Username for the account.

**sfcli Account getefficiency <options>**

Description	Options
This command enables you to retrieve efficiency statistics about a volume account. It returns efficiency information only for the account you specify.	accountid: Specifies the volume account for which efficiency statistics are returned.

**sfcli Account list <options>**

Description	Options
This command returns the entire list of accounts, with optional paging support.	includestoragecontainers: Includes storage containers in the response by default. To exclude storage containers, set to false. limit: Maximum number of AccountInfo objects to return. startaccountid: Starting AccountID to return. If no account exists with this AccountID, the next account by AccountID order is used as the start of the list. To page through the list, pass the AccountID of the last account in the previous response + 1.

**sfcli Account modify <options>**

Description	Options
<p>This command enables you to modify an existing account. When you lock an account, any existing connections from that account are immediately terminated. When you change an account's CHAP settings, any existing connections remain active, and the new CHAP settings are used on subsequent connections or reconnections. To clear an account's <code>attributes</code>, specify <code>{}</code> for the <code>attributes</code> option.</p>	<p><code>accountid</code>: Specifies the AccountID for the account to be modified.</p> <p><code>attributes</code>: List of name-value pairs in JSON object format.</p> <p><code>initiatorsecret</code>: Specifies the CHAP secret to use for the initiator. This secret must be 12-16 characters in length and should be impenetrable. The initiator CHAP secret must be unique and cannot be the same as the target CHAP secret.</p> <p><code>status</code>: Sets the status for the account. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>active</code>: The account is active and connections are allowed.</li> <li>• <code>locked</code>: The account is locked and connections are refused.</li> </ul> <p><code>targetsecret</code>: Specifies the CHAP secret to use for the target (mutual CHAP authentication). This secret must be 12-16 characters in length and should be impenetrable. The target CHAP secret must be unique and cannot be the same as the initiator CHAP secret.</p> <p><code>username</code>: Specifies the username associated with the account. (Might be 1 to 64 characters in length).</p>

**sfcli Account remove <options>**

Description	Options
<p>This command enables you to remove an existing account. You must delete and purge all volumes associated with the account before you can remove the account. If volumes on the account are still pending deletion, you cannot use this command to remove the account.</p>	<p><code>accountid</code>: Specifies the AccountID for the account to be removed.</p>



## Async command

You can use the commands in this section to learn about the running and completed asynchronous commands on the system.

### sfcli Async getresult <options>

Description	Options
You can use this command to retrieve the result of asynchronous commands. Some commands require some time to run, and might not be finished when the system sends the initial response. To obtain the status or result of the command, use this command to poll the asyncHandle value returned by the command. This command returns the overall status of the operation (in progress, completed, or error) in a standard fashion, but the actual data returned for the operation depends on the original command and the return data is documented with each command.	<p>asynchandle: Specifies a value that was returned from the original asynchronous method call.</p> <p>keepresult: If true, this command does not remove the asynchronous result upon returning it, enabling future queries to that asyncHandle.</p>

### sfcli Async listresults <options>

Description	Options
You can use this command to list the results of all currently running and completed asynchronous commands on the system. Querying asynchronous results with this command does not cause completed asyncHandles to expire; you can use the Async getresult command to query any of the asyncHandles returned by this command.	<p>asyncreulttypes: Specifies an optional list of types of results. You can use this list to restrict the results to only these types of operations. Possible values are:</p> <ul style="list-style-type: none"> <li>BulkVolume: Copy operations between volumes, such as backups or restores.</li> <li>Clone: Volume cloning operations.</li> <li>DriveRemoval: Operations involving the system copying data from a drive in preparation to remove it from the cluster.</li> <li>RtFiPendingNode: Operations involving the system installing compatible software on a node before adding it to the cluster.</li> </ul>

## Backup target commands

You can use the commands in this section to perform various operations related to your backup targets.

### sfcli BackupTarget create <options>

Description	Options
This command enables you to create and store backup target information so that you do not need to reenter it each time a backup is created.	<p>attributes: List of name-value pairs in JSON object format.</p> <p>name: The name of the backup target.</p>

### sfcli BackupTarget get <options>

Description	Options
This command enables you to get information about a specific backup target that you created.	<p>backuptargetid: The unique identifier assigned to the backup target.</p>

**sfcli BackupTarget list <options>**

Description	Options
This command enables you to retrieve information about all backup targets that have been created.	None

**sfcli BackupTarget modify <options>**

Description	Options
This command enables you to change attributes of a backup target.	<p><b>attributes:</b> List of name-value pairs in JSON object format.</p> <p><b>backuptargetid:</b> The unique target ID for the target to modify.</p> <p><b>name:</b> The new name for the backup target.</p>

**sfcli BackupTarget remove <options>**

Description	Options
This command enables you to delete backup targets.	<b>backuptargetid:</b> The unique target ID of the target to remove.

## Cluster administrator commands

You can use the commands in this section to perform cluster administrator tasks.

**sfcli ClusterAdmin add <options>**

Description	Options
This command enables you to add a Cluster Admin account. A cluster admin can manage the cluster using the API and management tools. Cluster admins are completely separate and unrelated to standard tenant accounts. Each cluster admin can be restricted to a subset of the API. NetApp recommends using multiple cluster admin accounts for different users and applications. You should give each cluster admin the minimal permissions necessary; this reduces the potential impact of credential compromise. You must accept the End User License Agreement (EULA) by setting the <code>acceptEula</code> parameter to true to add a cluster administrator account to the system.	<p><b>acceptEula:</b> Accept the End User License Agreement. Set to true to add a cluster administrator account to the system. If omitted or set to false, the command fails.</p> <p><b>access:</b> Controls which commands the cluster admin can use.</p> <p><b>attributes:</b> List of name/value pairs in JSON object format. This option is not required.</p> <p><b>password:</b> Password used to authenticate this cluster admin.</p> <p><b>username:</b> Unique username for this cluster admin. Must be between 1 and 1024 characters in length.</p>

**sfcli ClusterAdmin deleteauthsession <options>**

Description	Options
This command enables you to remove an individual authentication (auth) session. If the user initiating the command is not in the ClusterAdmins/Administrator access group, only the auth session belonging to that user can be deleted.	<b>sessionid:</b> Universally unique identifier (UUID) for the auth session to be deleted.

**sfcli ClusterAdmin deleteauthsessionsby <options>**

Description	Options
<p>This command enables you to remove all auth sessions associated with the specified ClusterAdminID. If the specified ClusterAdminID maps to a group of users, all auth sessions for all members of that group will be deleted. To see the list of sessions that could be deleted, use ListAuthSessionsByClusterAdmin with the same parameter.</p>	<p>clusteradminid: Identifier that identifies a clusterAdmin.</p>

**sfcli ClusterAdmin deleteauthsessionsbyusername <options>**

Description	Options
<p>This command enables you to remove all auth sessions for the given user. If the user initiating the command is not in an access group of cluster admins or administrators, the user may only delete their own sessions. A user with cluster admin or administrator privileges may delete sessions belonging to any user. To see the list of sessions that could be deleted, use ListAuthSessionsByUsername with the same parameters.</p>	<p>username: Name that uniquely identifies the user. When authMethod is Cluster, this specifies the ClusterAdmin user name. When authMethod is Ldap, this specifies the user's LDAP DN. When authMethod is IdP, this may specify the user's IdP user id or name id. If the IdP is not configured to return either, this specifies a random UUID issued when the session was created. Only a user in the ClusterAdmins / Administrator access group can provide this parameter.</p> <p>authmethod: Authentication method of the user sessions to be deleted. Only a caller in the ClusterAdmins / Administrator access group can provide this parameter.</p>

**sfcli ClusterAdmin getcurrent <options>**

Description	Options
<p>This command enables you to return information for the current primary Cluster Admin. The primary Cluster Admin was created when the cluster was created.</p>	<p>None</p>

**sfcli ClusterAdmin getloginbanner <options>**

Description	Options
<p>This command enables you to get the currently active Terms of Use banner that users see when they log in to the Element UI.</p>	<p>banner: The current text of the Terms of Use banner. This value can contain text even when the banner is disabled.</p> <p>enabled: The status of the Terms of Use banner. Possible values:</p> <ul style="list-style-type: none"> <li>• true: The Terms of Use banner is displayed upon web interface login.</li> <li>• false: The Terms of Use banner is not displayed upon web interface login.</li> </ul>

**sfcli ClusterAdmin list <options>**

Description	Options
<p>This command returns the list of all cluster administrators for the cluster. There can be several cluster administrator accounts with different levels of permissions. There can be only one primary cluster administrator in the system. The primary Cluster Admin is the administrator that was created when the cluster was created. You can also create LDAP administrators when setting up an LDAP system on the cluster.</p>	<p>None</p>

**sfcli ClusterAdmin listactiveauthsessions <options>**

Description	Options
<p>This command returns the list of all active authentication sessions. You need administrative access rights to use this command.</p>	<p>None</p>

**sfcli ClusterAdmin listauthsessionsby <options>**

Description	Options
<p>This command returns the list of all authentication sessions associated with the specified ClusterAdminID. If the specified ClusterAdminID maps to a group of users, the system lists all authentication sessions for all members of that group.</p>	<p><code>clusteradminid</code>: Specifies the cluster administrator you want to use as a filter for this command.</p>

**sfcli ClusterAdmin listauthsessionsbyusername <options>**

Description	Options
<p>This command returns the list of all authentication sessions for the given user. If you are not in the ClusterAdmins access group or do not have Administrator privileges, you can only list your own sessions. If you are in the ClusterAdmins access group or have Administrator privileges, you can list sessions belonging to any user.</p>	<p><code>authmethod</code>: Specifies the authentication method of the user sessions to be listed. You must be in the ClusterAdmins access group or have Administrator privileges to use this parameter. Authmethod options include:</p> <ul style="list-style-type: none"> <li>• Cluster</li> <li>• Idp</li> <li>• Ldap</li> </ul> <p><code>username</code>: Specify the name that uniquely identifies the user.</p> <ul style="list-style-type: none"> <li>• <i>Cluster</i>: Specifies the ClusterAdmin user name.</li> <li>• <i>Idp</i>: Specifies the user's IdP uid or NameID. If the IdP is not configured to return either, this specifies a random UUID issued when the session was created.</li> <li>• <i>Ldap</i>: Specifies the user's LDAP DN.</li> </ul> <p>You must be in the ClusterAdmins access group or have Administrator privileges to use this parameter. Otherwise, run the command without parameters.</p>

**sfcli ClusterAdmin modify <options>**

Description	Options
<p>This command enables you to change the settings for a Cluster Admin or LDAP Cluster Admin. You cannot change access for the administrator Cluster Admin account.</p>	<p><b>access:</b> Controls which methods this Cluster Admin can use. For more details, see "Access Control" in the <i>Element API Reference Guide</i>.</p> <p><b>attributes:</b> List of name-value pairs in JSON object format.</p> <p><b>clusteradminid:</b> ClusterAdminID for the Cluster Admin or LDAP Cluster Admin to modify. This is required.</p> <p><b>password:</b> Password used to authenticate this Cluster Admin.</p>

**sfcli ClusterAdmin remove <options>**

Description	Options
<p>This command enables you to remove a local cluster admin, an LDAP cluster admin, or a third party Identity Provider (IdP) cluster admin. You cannot remove the administrator cluster admin account. When an IdP Admin is removed that has authenticated sessions associated with a third party Identity Provider (IdP), those sessions will either logout or possibly experience a loss of access rights within their current session. The access rights loss will depend on whether the removed IdP cluster admin matched one of multiple IdP cluster admins from a given user's SAML Attributes and the remaining set of matching IdP cluster admins results in a reduced set of aggregate access rights. Other cluster admin user types will be logged out upon their cluster admin removal.</p>	<p><b>clusteradminid:</b> ClusterAdminID for the cluster admin to remove.</p>

**sfcli ClusterAdmin setloginbanner <options>**

Description	Options
<p>This command enables you to configure the currently active Terms of Use banner that users see when they log in to the Element UI.</p>	<p><b>banner:</b> The desired text of the Terms of Use banner. The maximum length allowed is 4,096 characters.</p> <p><b>enabled:</b> The status of the Terms of Use banner. Possible values:</p> <ul style="list-style-type: none"> <li>• true: The Terms of Use banner is displayed upon web interface login.</li> <li>• false: The Terms of Use banner is not displayed upon web interface login.</li> </ul>

## Cluster commands

You can use the commands in this section to perform various operations on the cluster, such as getting the configuration information about the cluster, retrieving information about any faults on your cluster, and so on.

### sfcli Cluster checkproposednodeadditions <options>

Description	Options
This command validates that adding a node (or nodes) to an existing cluster is likely to succeed. Any problems with the proposed new cluster are returned as errors with a human-readable description and unique error code.	nodes: Specifies the list of node IPs for the nodes in the new cluster.

### sfcli Cluster clearfaults <options>

Description	Options
This command enables you to remove information about both current and previously detected faults. You can remove both resolved and unresolved faults.	faulttypes: Determines the types of faults cleared. Possible values are: <ul style="list-style-type: none"> <li>• current: Faults that are currently detected and have not been resolved.</li> <li>• resolved: (Default) Faults that were previously detected and resolved.</li> <li>• all: Both current and resolved faults. The fault status can be determined by the resolved field of the fault object.</li> </ul>

### sfcli Cluster create <options>

Description	Options
<p>This command enables you to initialize the node in a cluster that has ownership of the storage virtual IP address (SVIP) and management virtual IP address (MVIP). Each new cluster is initialized using the management IP (MIP) of the first node in the cluster. This command also automatically adds all the nodes being configured into the cluster. You only need to use this command once each time a new cluster is initialized.</p> <p><b>Note:</b> You need to log in to the node that is used as the master node for the cluster. After you log in, run <code>getbootstrapconfig</code> on the node to get the IP addresses for the rest of the nodes that you want to include in the cluster. Then, run the <code>create</code> command.</p>	accepteula: Required to indicate your acceptance of the End User License Agreement when creating this cluster. Set this option to true. attributes: List of name-value pairs in JSON object format. mvip: Floating (virtual) IP address for the cluster on the management network. nodes: CIP/SIP addresses of the initial set of nodes making up the cluster. This node's IP must be in the list. password: Initial password for the cluster admin account. svip: Floating (virtual) IP address for the cluster on the storage (iSCSI) network. username: Username for the cluster admin.

**sfcli Cluster createinterfacepreference <options>**

Description	Options
This command enables you to create a new cluster preference and store it on your storage cluster.	<p><code>name</code>: The name of the cluster interface preference. This option is required.</p> <p><code>value</code>: The value of the cluster interface preference. This option is required.</p>

**sfcli Cluster createsupportbundle <options>**

Description	Options
This command enables you to create a support bundle file under the node's directory. The bundle is stored on the node as a <code>tar.gz</code> file.	<p><code>bundlename</code>: The unique name for the support bundle. If no name is provided, <code>supportbundle</code> and the node name are used as the filename.</p> <p><code>extraargs</code>: Passed to the <code>sf_make_support_bundle</code> script. You should use this option only at the request of NetApp Support.</p> <p><code>timeoutsec</code>: The number of seconds to allow the support bundle script to run before stopping. The default value is 1500 seconds.</p>

**sfcli Cluster deleteinterfacepreference <options>**

Description	Options
This command removes a cluster preference stored on your storage cluster.	<p><code>name</code>: The name of the cluster interface preference. This option is required.</p>

**sfcli Cluster deleteallsupportbundles <options>**

Description	Options
This command enables you to delete all support bundles generated with the <code>createsupportbundle</code> command.	None

**sfcli Cluster disableencryptionatrest <options>**

Description	Options
This command enables you to remove the encryption that was previously applied to the cluster using the <code>enableencryptionatrest</code> . This command is asynchronous and returns a response before encryption is disabled.	None

**sfcli Cluster disablemaintenancemode <options>**

Description	Options
This command enables you to take a node out of maintenance mode. This should be called after maintenance is complete and the node is online.	<p><code>nodes</code>: Specify the list of Node IDs to take out of maintenance mode.</p>

**sfcli Cluster enableencryptionatrest <options>**

Description	Options
<p>This command enables the Advanced Encryption Standard (AES) 256-bit encryption at rest on the cluster, so that the cluster can manage the encryption key used for the drives on each node. This feature is not enabled by default. When you enable this feature, the cluster automatically manages encryption keys internally for the drives on each node in the cluster.</p> <p><b>Note:</b> If you have a node type with a model number ending in "-NE", the command fails with a response of "Encryption not allowed. Cluster detected non-encryptable node".</p> <p>You should enable or disable encryption only when the cluster is running and in a healthy state. You can enable or disable encryption at your discretion and as often as you need.</p>	<p>None</p>

**sfcli Cluster enablemaintenancemode <options>**

Description	Options
<p>This command enables you to prepare a node for maintenance. Maintenance includes anything that will require the node to be powered-off or restarted.</p>	<p><code>forcewithunresolvedfaults</code>: Use this option to force maintenance mode to be enabled even with blocking cluster faults present.</p> <p><code>nodes</code>: Specify a list of Node IDs to put into maintenance mode.</p> <p><code>perminuteprimaryswaplimit</code>: Specify the number of primaries to swap per minute. If not specified, all will be swapped at once.</p> <p><code>timeout</code>: Specify how long to allow maintenance mode to remain enabled before automatically disabling. Formatted in <code>HH:mm:ss</code>. If not specified, it will remain enabled until explicitly disabled</p>

**sfcli Cluster getactivetlsciphers <options>**

Description	Options
<p>This command gets a list of the Transport Layer Security (TLS) ciphers that are currently accepted on the cluster.</p>	<p>None</p>

**sfcli Cluster getapi <options>**

Description	Options
<p>This command enables you to return a list of all the API methods and supported API endpoints that can be used in the system.</p>	<p>None</p>

**sfcli Cluster getbinassignmentproperties <options>**

Description	Options
<p>This command enables you to retrieve the bin assignment properties in the database.</p>	<p>None</p>



**sfcli Cluster getcapacity <options>**

Description	Options
This command enables you to return the high-level capacity measurements for an entire cluster. You can use the fields returned from this command to calculate the efficiency rates that are displayed in the Element.	None

**sfcli Cluster getcompletestats <options>**

Description	Options
NetApp engineering uses this command to troubleshoot new features. The data returned from is not documented, changes frequently, and is not guaranteed to be accurate. NetApp does not recommend using this command for collecting performance data or any other management integration with a SolidFire storage cluster.	None

**sfcli Cluster getconfig <options>**

Description	Options
This command enables you to return information about the cluster configuration this node uses to communicate with the cluster that it is a part of.	None

**sfcli Cluster getfullthreshold <options>**

Description	Options
<p>This command enables you to view the stages set for cluster fullness levels. It returns all fullness metrics for the cluster.</p> <p><b>Note:</b> When a cluster reaches the Error stage of block cluster fullness, the maximum IOPS on all volumes are reduced linearly to the volume's minimum IOPS as the cluster approaches the Critical stage. This helps prevent the cluster from reaching the Critical stage of block cluster fullness.</p>	None

**sfcli Cluster getinfo <options>**

Description	Options
This command enables you to return configuration information about the cluster.	None

**sfcli Cluster getinterfacepreference <options>**

Description	Options
This command retrieves information about a cluster preference stored on your storage cluster.	name: The name of the cluster interface preference. This option is required.

**sfcli Cluster getlicensekey <options>**

Description	Options
This command enables you to get the current license key.	None

**sfcli Cluster getlimits <options>**

Description	Options
<p>This command enables you to retrieve the limit values set by the API. These values might change between releases of Element, but do not change without an update to the system.</p> <p><b>Note:</b> This command returns the limits for the current software version regardless of the API endpoint version used to pass the command.</p>	None

**sfcli Cluster getmasternodeid <options>**

Description	Options
This command enables you to retrieve the ID of the node that can perform cluster-wide administration tasks and holds the SVIP and MVIP.	None

**sfcli Cluster getntpinfo <options>**

Description	Options
This command enables you to return the current network time protocol (NTP) configuration information.	None

**sfcli Cluster getprotectiondomainlayout <options>**

Description	Options
This command returns all the Protection Domain information for the cluster.	None

**sfcli Cluster getrawstats <options>**

Description	Options
NetApp engineering uses this command to troubleshoot new features. The data returned is not documented, changes frequently, and is not guaranteed to be accurate. NetApp does not recommend using this command for collecting performance data or any other management integration with a SolidFire storage cluster.	None

**sfcli Cluster getsslcertificate <options>**

Description	Options
This command enables you to retrieve the SSL certificate that is currently active on the storage nodes of the cluster.	None

**sfcli Cluster getstate <options>**

Description	Options
<p>This command enables you to indicate if a node is part of a cluster or not. The three states are:</p> <ul style="list-style-type: none"> <li>• Available: Node has not been configured with a cluster name.</li> <li>• Pending: Node is pending for a specific named cluster and can be added.</li> <li>• Active: Node is an active member of a cluster and may not be added to another cluster.</li> </ul>	<p><code>force</code>: To run this command, set this option to true.</p>

**sfcli Cluster getstats <options>**

Description	Options
<p>This command enables you to retrieve high-level activity measurements for the cluster. Values returned are cumulative from the creation of the cluster.</p>	<p>None</p>

**sfcli Cluster getstructure <options>**

Description	Options
<p>This command backs up the current storage cluster configuration information. If the storage cluster configuration is changed while this command is running, the contents of the configuration backup will be unpredictable. You can save this data to a text file and restore it on other clusters, or the cluster in the case of a disaster.</p>	<p>None</p>

**sfcli Cluster getsupportedtlsciphers <options>**

Description	Options
<p>This command gets a list of the TLS ciphers on this node. You can use this command on both management and storage nodes.</p>	<p>No options available.</p>

**sfcli Cluster getsystemstatus <options>**

Description	Options
<p>This command enables you to return whether a reboot is required or not.</p>	<p>None</p>

**sfcli Cluster getversioninfo <options>**

Description	Options
<p>This command enables you to retrieve information about the Element software version running on each node in the cluster. This command also returns information about nodes that are currently in the process of upgrading software.</p>	<p>None</p>

**sfcli Cluster listevents <options>**

Description	Options
<p>This command returns events detected on the cluster, sorted from oldest to newest.</p>	<p><b>driveid:</b> Specifies that only events with this DriveID will be returned.</p> <p><b>endeventid:</b> Specifies the end of a range of events to return.</p> <p><b>endpublishtime:</b> Specifies that only events published earlier than this time will be returned.</p> <p><b>endreporttime:</b> Specifies that only events reported earlier than this time will be returned.</p> <p><b>eventtype:</b> Specifies the type of events to return.</p> <p><b>maxevents:</b> Specifies the maximum number of events to return.</p> <p><b>nodeid:</b> Specifies that only events with this NodeID will be returned.</p> <p><b>serviceid:</b> Specifies that only events with this ServiceID will be returned.</p> <p><b>starteventid:</b> Identifies the beginning of a range of events to return.</p> <p><b>startpublishtime:</b> Specifies that only events published after this time will be returned.</p> <p><b>startreporttime:</b> Specifies that only events reported after this time will be returned.</p>

**sfcli Cluster listfaults <options>**

Description	Options
<p>This command enables you to retrieve information about any faults detected on the cluster. With this command, you can retrieve both current faults as well as faults that have been resolved. The system caches faults every 30 seconds.</p>	<p><b>bestpractices:</b> Specifies whether to include faults triggered by suboptimal system configuration. Possible values are: true or false.</p> <p><b>faulttypes:</b> Determines the types of faults returned. Possible values are: current (List active, unresolved faults), resolved (list faults that were previously detected and resolved), and all (default; list both current and resolved faults). You can see the fault status in the resolved field of the Cluster Fault object.</p>

**sfcli Cluster listinterfacepreferences <options>**

Description	Options
<p>This command shows all existing cluster preferences stored on your storage cluster.</p>	<p>None</p>

**sfcli Cluster listprotectiondomainlevels <options>**

Description	Options
This command returns the tolerance and resiliency information for the cluster.	None

**sfcli Cluster listsyncjobs <options>**

Description	Options
This command enables you to return information about synchronization jobs that are running on a SolidFire storage cluster. The type of synchronization jobs that are returned with this command are slice, clone, and remote.	None

**sfcli Cluster modifyfullthreshold <options>**

Description	Options
You can use this command to change the level at which the system generates an event when the storage cluster approaches a certain capacity utilization.	<p>maxMetadataOverProvisionFactor: A value representative of the number of times metadata space can be overprovisioned relative to the amount of space available.</p> <p>stage2AwareThreshold: The percentage of block storage utilization below the Error threshold that causes the system to trigger a cluster Warning alert.</p> <p>stage3blockthresholdpercent: The number of nodes of capacity remaining in the cluster before the system triggers a capacity notification.</p>

**sfcli Cluster modifyinterfacepreference <options>**

Description	Options
This command changes an existing cluster preference stored on your storage cluster.	<p>name: The name of the cluster interface preference. This option is required.</p> <p>value: The value of the cluster interface preference. This option is required.</p>

**sfcli Cluster removesslcertificate <options>**

Description	Options
This command enables you to remove the user SSL certificate and private key for the storage nodes in the cluster. After the certificate and private key are removed, the storage nodes are configured to use the default certificate and private key.	None

**sfcli Cluster resetsupplementaltlsciphers <options>**

Description	Options
This command can restore the supplemental ciphers to their defaults.	None

**sfcli Cluster setconfig <options>**

Description	Options
<p>This command enables you to set the configuration the node uses to communicate with the cluster.</p>	<p><code>cipi</code>: Network interface used for cluster communication.</p> <p><code>clusterconfig</code>: Configures the cluster.</p> <p><code>clustercluster</code>: Unique cluster name.</p> <p><code>encryptioncapable</code>: Indicates whether the node supports encryption.</p> <p><code>ensemble</code>: Nodes that are participating in the cluster.</p> <p><code>fipsdriveconfiguration</code>: Indicates whether the node supports FIPS 140-2 certified drives.</p> <p><code>haslocaladmin</code>: Indicates whether the cluster has a local administrator.</p> <p><code>mipi</code>: Network interface used for node management.</p> <p><code>name</code>: Unique cluster name.</p> <p><code>nodeid</code>: Identifies the nodes that are participating in the cluster.</p> <p><code>pendingnodeid</code></p> <p><code>role</code>: Identifies the role of the node.</p> <p><code>sipi</code>: Network interface used for storage.</p> <p><code>state</code>: Indicates the state.</p> <p><code>version</code>: Indicates the version.</p>

**sfcli Cluster setlicensekey <options>**

Description	Options
<p>This command enables you to set the serial number and order number for the cluster.</p>	<p><code>ordernumber</code>: Specifies the new sales order number for this cluster.</p> <p><code>serialnumber</code>: Specifies the new Serial Number for this cluster.</p>

**sfcli Cluster setntpinfo <options>**

Description	Options
<p>This command enables you to configure NTP on cluster nodes. The values you set with this interface apply to all nodes in the cluster. If an NTP broadcast server periodically broadcasts time information on your network, you can optionally configure nodes as broadcast clients.</p> <p><b>Note:</b> NetApp recommends using NTP servers that are internal to your network, rather than the installation defaults.</p>	<p><code>broadcastclient</code>: Enables every node in the cluster as a broadcast client. [This is optional.</p> <p><code>servers</code>: List of NTP servers to add to each nodes NTP configuration.</p>

**sfcli Cluster setprotectiondomainlayout <options>**

Description	Options
<p>This command enables you to assign nodes to user-defined protection domains. This information must be provided for all active nodes in the cluster, and no information may be provided for nodes that are not active. All nodes in a given chassis must be assigned to the same user-defined protection domain. The same <code>ProtectionDomainType</code> must be supplied for all nodes. Protection domain types that are not user-defined, such as <code>Node</code> and <code>Chassis</code>, must not be included. If any of these are not true, the custom protection domains will be ignored, and an appropriate error will be returned.</p>	<p><code>nodeid</code>: Specifies the unique identifier for the node.</p> <p><code>protectiondomainlayout</code>: Specifies the Protection Domains for each Node.</p> <p><code>protectiondomainname</code>: Specifies the Protection Domain Name.</p> <p><code>protectiondomains</code>: Specifies the Protection Domains of which the Node is a member.</p> <p><code>protectiondomaintype</code>: Specifies the Protection Domain Type.</p>

**sfcli Cluster setsslcertificate <options>**

Description	Options
<p>This command enables you to set a user SSL certificate and private key for the storage nodes in the cluster.</p>	<p><code>certificate</code>: The PEM-encoded text version of the certificate.</p> <p><code>privatekey</code>: The PEM-encoded text version of the private key.</p>

**sfcli Cluster setstructure <options>**

Description	Options
<p>This command restores the storage cluster configuration information from a backup. When you use this command, pass the json result returned from the sfcli Cluster getstructure command containing the configuration information you want to restore.</p>	<p>accounts</p> <p>features</p> <p>getactivetlsciphersresultmandatoryciphers: List of mandatory TLS cipher suites for the cluster.</p> <p>getactivetlsciphersresultsupplementalciphers: List of supplemental TLS cipher suites for the cluster.</p> <p>getntpinforesultbroadcastclient: Indicates whether or not the nodes in the cluster are listening for broadcast NTP messages. Possible values: true or false.</p> <p>getntpinforesultservers: List of NTP servers.</p> <p>initiators</p> <p>qospolicies</p> <p>remotehosts</p> <p>schedules</p> <p>storagecontainers</p> <p>virtualnetworks</p> <p>volumeaccessgroupunassignments</p> <p>volumeaccessgroups</p> <p>volumeqosburstiops: Specifies the maximum peak 4KB IOPS allowed for short periods of time. Allows for bursts of I/O activity over the normal max IOPS value.</p> <p>volumeqosbursttime: Specifies the length of time burst IOPS is allowed. The value returned is represented in time units of seconds.</p> <p><b>Note:</b> This value is calculated by the system based on IOPS set for QoS.</p> <p>volumeqoscurve: The curve is a set of key-value pairs. The keys are I/O sizes in bytes. The values represent the cost of performing an IOP at a specific I/O size. The curve is calculated relative to a 4096 byte operation set at 100 IOPS.</p> <p>volumeqosmaxiops: Specifies the desired maximum 4KB IOPS allowed over an extended period of time.</p> <p>volumeqosminiops: Specifies the desired minimum 4KB IOPS to guarantee. The allowed IOPS will only drop below this level if all volumes have been capped at their min IOPS value and there is still insufficient performance capacity.</p> <p>volumes</p>



**sfcli Cluster setsupplementaltlsciphers <options>**

Description	Options
This command lists the supplemental TLS ciphers for this cluster.	<b>supplementalCiphers:</b> Specifies the supplemental cipher suite names using the OpenSSL naming scheme. Use of cipher suite names is case-insensitive.

**sfcli Cluster testaddressavailability <options>**

Description	Options
You can use this command to check to see if a certain IP address is in use on an interface within the storage cluster.	<b>address:</b> Specifies the IP address to scan for on the target interface. This option is required. <b>interface:</b> Specifies the target network interface (such as eth0, Bond10G, etc.). This option is required. <b>timeout:</b> Specifies the timeout in seconds for testing the target address. <b>virtualnetworktag:</b> Specifies the target VLAN ID.

## Drive commands

You can use the commands in this section to perform operations, such as adding drives to a cluster, removing drives from a cluster, getting hardware information about the drives in a cluster.

**sfcli Drive add <options>**

Description	Options
This command enables you to add one or more available drives to the cluster, enabling the drives to host a portion of the cluster's data. When you add a node to the cluster or install new drives in an existing node, the new drives are marked as "available" and must be added via the <code>Drive add</code> command before they can be used. Use the <code>Drive list</code> command to display drives that are "available" to be added. When you add multiple drives, it is more efficient to add them in a single <code>Drive add</code> command rather than multiple commands with a single drive each. This reduces the amount of data balancing that must occur to stabilize the storage load on the cluster. When you add a drive, the system automatically determines the "type" of drive it should be. The command is asynchronous and returns immediately. However, it can take some time for the data in the cluster to be rebalanced using the newly added drives. As the new drives are syncing on the system, you can use the <code>Cluster listsyncjobs</code> command to see how the drives are being rebalanced and the progress of adding the new drive. You can also use the <code>Async GetResult</code> command to query the returned <code>asyncHandle</code> .	<b>drives:</b> Returns information about each drive to be added to the cluster. Possible values: <ul style="list-style-type: none"> <li>• <code>driveID:</code> Optional; ID of the drive to add.</li> <li>• <code>type:</code> Type of drive to add; valid values are "slice" or "block."</li> </ul> This is required. <b>driveid:</b> Specifies a unique identifier for this drive. <b>type:</b> Specifies whether the drive type is "slice" or "block."

**sfcli Drive getconfig <options>**

Description	Options
This command enables you to display drive information for expected slice and block drive counts as well as the number of slices and block drives that are currently connected to the node.	None

**sfcli Drive gethardwareinfo <options>**

Description	Options
This command returns all the hardware information for the given drive. This generally includes details about manufacturers, vendors, versions, and other associated hardware identification information.	driveid: DriveID for the drive information requested.

**sfcli Drive getstats <options>**

Description	Options
This command returns high-level activity measurements for a single drive. Values are cumulative from the addition of the drive to the cluster. Some values are specific to block drives. You might not obtain statistical data for both block and metadata drives when you run this command.	driveid: Specifies the drive for which statistics are gathered.

**sfcli Drive list <options>**

Description	Options
This command enables you to retrieve the list of the drives that exist in the cluster's active nodes. It returns drives that have been added as volume metadata or block drives as well as drives that have not been added and are available.	None

**sfcli Drive listhardware <options>**

Description	Options
This command returns all the drives connected to a node. Use this command on individual nodes to return drive hardware information or use it on the cluster master node MVIP to see information for all the drives on all nodes.	force: Set this option to true.

**sfcli Drive liststats <options>**

Description	Options
This command enables you to retrieve high-level activity measurements for multiple drives in the cluster. By default, this command returns statistics for all drives in the cluster, and these measurements are cumulative from the addition of the drive to the cluster. Some values this command returns are specific to block drives, and some are specific to metadata drives.	drives: Optional list of DriveIDs for which to return drive statistics. If you omit this option, measurements for all drives are returned.

**sfcli Drive remove <options>**

Description	Options
<p>This command enables you to proactively remove drives that are part of the cluster. You might want to use this when reducing cluster capacity or preparing to replace drives nearing the end of their service life. Any data on the drives is removed and migrated to other drives in the cluster before the drive is removed from the cluster. This is an asynchronous command. Depending on the total capacity of the drives being removed, it might take several minutes to migrate all of the data.</p>	<p><code>drives</code>: List of driveIDs to remove from the cluster. This is required.</p>

**sfcli Drive reset <options>**

Description	Options
<p>This command enables you to proactively initialize drives and remove all data currently residing on a drive. The drive can then be reused in an existing node or used in an upgraded node. You must specify the <code>force</code> option for this command.</p>	<p><code>drives</code>: List of device names (not driveIDs) to reset.</p> <p><code>force</code>: Required option to successfully reset a drive.</p>

**sfcli Drive secureerase <options>**

Description	Options
<p>This command enables you to remove any residual data from drives that have a status of "available". You might want to use this when replacing a drive nearing the end of its service life that contained sensitive data.</p>	<p><code>drives</code>: List of driveIDs to be secure erased.</p>

**sfcli Drive test <options>**

Description	Options
<p>This command enables you to run a hardware validation on all drives on the node. It detects hardware failures on the drives (if present) and reports them in the results of the validation tests. You can use this command only on nodes that are not "active" in a cluster.</p> <p><b>Note:</b> This test takes approximately 10 minutes.</p>	<p><code>force</code>: Required parameter to successfully test the drives on the node.</p> <p><code>minutes</code>: Specifies the number of minutes to run the test.</p>

## Hardware information commands

You can use the commands in this section to get hardware information about nodes and drives in a cluster.

**sfcli Hardware disablebmccoldreset <options>**

Description	Options
<p>This command disables the background task that periodically resets the Baseboard Management Controller (BMC) for all nodes in the cluster.</p>	<p>None</p>

**sfcli Hardware enablebmccoldreset <options>**

Description	Options
This command enables a background task that periodically resets the Baseboard Management Controller (BMC) for all nodes in the cluster..	timeout: If set, the time between BMC reset operations in minutes. The default is 20160 minutes.

**sfcli Hardware getclusterinfo <options>**

Description	Options
This command retrieves the hardware status and information for all Fibre Channel nodes, iSCSI nodes and drives in the cluster. This generally includes details about manufacturers, vendors, versions, and other associated hardware identification information.	type: Includes only a certain type of hardware information in the response. Possible values are: drives (list only drive information in the response), nodes (list only node information in the response), and all (include both drive and node information in the response). If this option is omitted, a type of "all" is assumed.

**sfcli Hardware getconfig <options>**

Description	Options
This command enables you to display the hardware configuration information for a node.	None

**sfcli Hardware gethardwareinfo <options>**

Description	Options
The command allows you to return hardware information and status for a single node. This generally includes details about manufacturers, vendors, versions, drives, and other associated hardware identification information.	None

**sfcli Hardware getinfo <options>**

Description	Options
This command enables you to return hardware information and status for a single node. This generally includes details about manufacturers, vendors, versions, drives, and other associated hardware identification information.	None

**sfcli Hardware getnodeinfo <options>**

Description	Options
This command enables you to return all the hardware information and status for the node specified. This generally includes details about manufacturers, vendors, versions, and other associated hardware identification information.	nodeid: The ID of the node for which you need the hardware information. Information about a Fibre Channel node is returned if a Fibre Channel node is specified.

**sfcli Hardware getnvraminfo <options>**

Description	Options
This command enables you to retrieve information from each node about the NVRAM card.	force: Required option for the command to successfully run on all nodes in the cluster.

## IdP commands

An identity provider is a service that authenticates, stores, and manages identity information for users. An IdP is often used as the central storage and authenticator for SSO systems.

**sfcli IDP addidpclusteradmin <options>**

Description	Options
This command enables you add a cluster administrator user authenticated by a third party Identity Provider (IdP). IdP cluster admin accounts are configured based on SAML attribute-value information provided within the IdP's SAML assertion associated with the user. If a user successfully authenticates with the IdP and has SAML attribute statements within the SAML assertion matching multiple IdP cluster admin accounts, the user will have the combined access level of those matching IdP cluster admin accounts.	<p>accepteula: Accept the End User License Agreement. Set to true to add a cluster administrator account to the system. If omitted or set to false, the method call fails.</p> <p>access: Controls which methods this IdP Cluster Admin can use. For more details on the levels of access, see the Access Control appendix in the <i>API Reference</i>.</p> <p>attributes: List of name-value pairs in JSON object format.</p> <p>username: A SAML attribute-value mapping to a IdP cluster admin (e.g. email=test@example.com). This could be defined using a specific SAML subject using NameID, or an entry in the SAML attribute statement such as eduPersonAffiliation.</p>

**sfcli IDP createidpconfiguration <options>**

Description	Options
This command enables you to create a potential trust relationship for authentication using a third party Identity Provider (IdP) for the cluster. A SAML Service Provider certificate is required for IdP communication, which will be generated as necessary.	<p>idpname: Specifies the name used to identify an IdP provider for SAML 2.0 single sign-on.</p> <p>idpmetadata: Provides the IdP Metadata to store.</p>

**sfcli IDP deleteidpconfiguration <options>**

Description	Options
This command enables you to delete an existing configuration with a third party Identity Provider (IdP) for the cluster. Deleting the last IdP Configuration will remove the SAML Service Provider certificate from the cluster.	<p>idpconfigurationid: Specifies the UUID for the third party Identity Provider (IdP) Configuration array of IDs of initiators to delete.</p> <p>idpname: Specifies the name for identifying and retrieving IdP provider for SAML 2.0 single sign-on.</p>

**sfcli IDP disableidpauthentication <options>**

Description	Options
<p>This command lets you disable support for authentication using third party Identity Providers (IdP) for the cluster. Once disabled, users authenticated by third party IdPs will no longer be able to access the cluster and any active authenticated sessions will be invalidated/logged out. Ldap and cluster admins will be able to access the cluster via supported UIs.</p>	<p>None</p>

**sfcli IDP enableidpauthentication <options>**

Description	Options
<p>This command lets you enable support for authentication using a third party Identity Provider (IdP) for the cluster. Once IdP authentication is enabled, cluster and Ldap admins will no longer be able to access the cluster via supported UIs and any active authenticated sessions will be invalidated/logged out. Only third party IdP authenticated users will be able to access the cluster via the supported UIs.</p>	<p>idpconfigurationid: Specifies the UUID for the third party Identity Provider (IdP) Configuration. If only one IdP Configuration exists, then we will default to enabling that configuration.</p>

**sfcli IDP getidpauthenticationstate <options>**

Description	Options
<p>This command enables you to return information regarding the state of authentication using third party Identity Providers.</p>	<p>None</p>

**sfcli IDP listidpconfigurations <options>**

Description	Options
<p>This command enables you to list configurations for third party Identity Provider(s) (IdP), optionally providing either enabledOnly flag to retrieve the currently enabled IdP configuration, or an IdP meta data UUID or IdP name to query a specific IdP configuration information.</p>	<p>enabledonly: Filters the result to return the currently enabled IdP configuration. idpconfigurationid: Specifies the UUID for the third party Identity Provider (IdP) Configuration. idpname: Filters the result to an IdP configuration information for a specific IdP name.</p>

**sfcli IDP updateidpconfiguration <options>**

Description	Options
<p>This command enables you to update an existing configuration with a third party Identity Provider (IdP) for the cluster.</p>	<p><b>generatenewcertificate:</b> If true, generate new SAML key/certificate and replace the existing pair. NOTE: Replacing the existing certificate will disrupt the established trust between the Cluster and the IdP until Cluster's Service Provider meta data is reloaded at the IdP. If not provided or false, the SAML certificate and key will remain unchanged.</p> <p><b>idpconfigurationid:</b> Specifies the UUID for the third party Identity Provider (IdP) Configuration.</p> <p><b>idpmetadata:</b> Specifies IdP meta data for configuration and integration details for SAML 2.0 single sign-on.</p> <p><b>idpname:</b> Filters the result to an IdP configuration information for a specific IdP name.</p> <p><b>newidpname:</b> If specified, replaces the IdP name.</p>

**Initiator commands**

Initiators enable external clients access to volumes in a cluster, serving as the entry point for communication between clients and volumes. You can create and delete initiators, and give them friendly aliases to simplify administration and volume access. When you add an initiator to a volume access group, that initiator enables access to all volumes in the group.

**sfcli Initiators addtovolumeaccessgroup <options>**

Description	Options
<p>This command enables you to add initiators to a specified volume access group.</p>	<p><b>initiators:</b> The list of initiators to add to the volume access group.</p> <p><b>volumeaccessgroupid:</b> The ID of the volume access group to modify.</p>

**sfcli Initiators create <options>**

Description	Options
<p>This command enables you to create multiple new initiator IQNs or World Wide Port Names (WWPNs) and optionally assign them aliases and attributes. When you use this command to create new initiators, you can also add them to volume access groups. If this command fails to create one of the initiators you specify, you get an error, and the command does not create any initiators (no partial completion is possible).</p>	<p><b>alias:</b> If specified, a friendly name to assign to the initiator.</p> <p><b>attributes:</b> If specified, a set of JSON attributes to assign to the initiator.</p> <p><b>chapusername:</b> If specified, the CHAP username for this initiator. Defaults to the initiator name (IQN) if not specified during creation and "requireChap" is true.</p> <p><b>initiators:</b> A list of objects containing characteristics of each new initiator.</p> <p><b>initiatorsecret:</b> The CHAP secret used for authentication of the initiator. Defaults to a randomly generated secret if not specified during creation and "requireChap" is true.</p> <p><b>requirechap:</b> Determines if the initiator is required to use CHAP during session login. CHAP is optional if "requireChap" is false.</p> <p><b>targetsecret:</b> The CHAP secret used for authentication of the target. Defaults to a randomly generated secret if not specified during creation and "requireChap" is true.</p>

**sfcli Initiators delete <options>**

Description	Options
<p>This command enables you to delete one or more initiators from the system (and from any associated volumes or volume access groups). If this command fails to delete one of the initiators you specify, the system returns an error and does not delete any initiators (no partial completion is possible).</p>	<p><b>initiators:</b> An array of IDs of initiators to delete.</p>

**sfcli Initiators list <options>**

Description	Options
<p>This command enables you to list initiator IQNs or World Wide Port Names (WWPNs).</p>	<p><b>initiators:</b> A list of initiator IDs to retrieve. You can provide a value for this parameter or the <code>startinitiatorid</code> option, but not both.</p> <p><b>limit:</b> The maximum number of initiator objects to return.</p> <p><b>startinitiatorid:</b> The initiator ID at which to begin the listing. You can supply this option or the <code>initiators</code> option, but not both.</p>



**sfcli Initiators modify <options>**

Description	Options
<p>This command enables you to change the attributes of one or more existing initiators. You cannot change the name of an existing initiator. If you need to change the name of an initiator, delete it first and create a new one. If this command fails to change one of the initiators you specify, you get an error, and the command does not modify any initiators (no partial completion is possible).</p>	<p><b>alias:</b> If specified, a friendly name to assign to the initiator.</p> <p><b>attributes:</b> If specified, a set of JSON attributes to assign to the initiator.</p> <p><b>chapusername:</b> If specified, the CHAP username for this initiator. Defaults to the initiator name (IQN) if not specified during creation and "requireChap" is true.</p> <p><b>initiatorid:</b> (Required) The ID of the initiator to modify.</p> <p><b>initiators:</b> A list of objects containing characteristics of each initiator to modify.</p> <p><b>initiatorsecret:</b> The CHAP secret used for authentication of the initiator. Defaults to a randomly generated secret if not specified during creation and "requireChap" is true.</p> <p><b>requirechap:</b> Determines if the initiator is required to use CHAP during session login. CHAP is optional if "requireChap" is false.</p> <p><b>targetsecret:</b> The CHAP secret used for authentication of the target. Defaults to a randomly generated secret if not specified during creation and "requireChap" is true.</p> <p><b>volumeaccessgroupid:</b> If specified, the ID of the volume access group to which the initiator should be added. If the initiator was previously in a different volume access group, it is removed from the old volume access group. If this key is present but null, the initiator is removed from its current volume access group, but not placed in any new volume access group.</p>

**sfcli Initiators removefromvolumeaccessgroup <options>**

Description	Options
<p>This command enables you to remove initiators from a specified volume access group.</p>	<p><b>deleteorphaninitiators:</b> Specifies whether to delete initiator objects after they are removed from a volume access group or not. Possible values are:</p> <ul style="list-style-type: none"> <li>• true: Delete initiator objects after they are removed from a volume access group.</li> <li>• false: Do not delete initiator objects after they are removed from a volume access group.</li> </ul> <p><b>initiators:</b> The list of initiators to remove from the volume access group.</p> <p><b>volumeaccessgroupid:</b> The ID of the volume access group from which the initiators are removed.</p>

## Lightweight Directory Access Protocol (LDAP) commands

You can set up LDAP to enable secure directory-based login functionality to SolidFire storage. You can use the commands in this section to perform operations, such as enabling and disabling LDAP authentication.

### sfcli LDAP addclusteradmin <options>

Description	Options
This command enables you to add a new LDAP cluster administrator user.	accepteula: Accept the End User License Agreement. Set to true to add a cluster administrator account to the system. If omitted or set to false, the command fails.  access: Controls which methods this cluster admin can use. For more details on the levels of access, see the "Access Control" appendix in the <i>NetApp Element API Reference</i> .  attributes: List of name-value pairs in JSON object format.  username: The distinguished username for the new LDAP cluster admin.

### sfcli LDAP disableauthentication <options>

Description	Options
This command enables you to disable LDAP authentication and remove all LDAP configuration settings. It does not remove any configured cluster admin accounts (user or group). However, those cluster admin accounts will no longer be able to log in.	None

**sfcli LDAP enableauthentication <options>**

Description	Options
<p>This command enables you to configure an LDAP directory connection to use for LDAP authentication to a cluster. Users that are members of the LDAP directory can then log in to the storage system using their LDAP credentials.</p>	<p><b>authtype:</b> Identifies which user authentication method to use. Must be either DirectBind or SearchAndBind.</p> <p><b>groupsearchbasedn:</b> The base DN of the tree to start the group search (will do a subtree search from here).</p> <p><b>groupsearchcustomfilter:</b> For use with the CustomFilter search type, an LDAP filter to use to return the DN's of a users groups. The string can have placeholder text of %USERNAME% and %USERDN% to be replaced with their username and full userDN as needed.</p> <p><b>groupsearchtype:</b> Controls the default group search filter used, and must be one of the following: NoGroups (no group support), ActiveDirectory (nested membership of all of a user's AD groups), MemberDN (memberDN style groups (single level).</p> <p><b>searchbinddn:</b> A fully qualified DN to log in with to perform an LDAP search for the user (needs read access to the LDAP directory).</p> <p><b>searchbindpassword:</b> The password for the searchBindDN account used for searching.</p> <p><b>serveruris:</b> A comma-separated list of LDAP server URIs (for example, "ldap://1.2.3.4" and ldaps://1.2.3.4:123").</p> <p><b>userdn-template:</b> A string that is used to form a fully qualified user DN. The string should have the placeholder text %USERNAME%, which is replaced with the username of the authenticating user.</p> <p><b>usersearchbasedn:</b> The base DN of the tree to start the search (will do a subtree search from here).</p> <p><b>usersearchfilter:</b> The LDAP filter to use. The string should have the placeholder text %USERNAME%, which is replaced with the username of the authenticating user. Example: (&amp;(objectClass=person)(sAMAccountName=%USERNAME%)) will use the sAMAccountName field in Active Directory to match the username entered at cluster login.</p>

**sfcli LDAP getconfiguration <options>**

Description	Options
<p>This command enables you to get the currently active LDAP configuration on the cluster.</p>	<p>None</p>

**sfcli LDAP testauthentication <options>**

Description	Options
<p>This command enables you to validate the currently enabled LDAP authentication settings. If the configuration is correct, you get the group membership of the tested user.</p>	<p>ldapconfigurationauthtype: Identifies which user authentication method will be used.          Valid values:</p> <ul style="list-style-type: none"> <li>• DirectBind</li> <li>• SearchAndBind</li> </ul> <p>ldapconfigurationenabled: Identifies whether or not the system is enabled for LDAP.          Valid values:</p> <ul style="list-style-type: none"> <li>• true</li> <li>• false</li> </ul> <p>ldapconfigurationgroupsearchbasedn: The base DN of the tree to start the group search (will do a subtree search from here).</p> <p>ldapconfigurationgroupsearchcustomfilter: The custom search filter used.</p> <p>ldapconfigurationgroupsearchtype: Controls the default group search filter used, can be one of the following:</p> <ul style="list-style-type: none"> <li>• NoGroups: No group support.</li> <li>• ActiveDirectory: Nested membership of all of a user's AD groups.</li> <li>• MemberDN: MemberDN style groups (single-level).</li> </ul> <p>ldapconfigurationsearchbinddn: A fully qualified DN to log in with to perform an LDAP search for the user (needs read access to the LDAP directory).</p> <p>ldapconfigurationserveruris: A comma-separated list of LDAP server URIs (examples: "ldap://1.2.3.4" and ldap://1.2.3.4:123")</p> <p>ldapconfigurationuserdn-template: A string that is used to form a fully qualified user DN.</p> <p>ldapconfigurationusersearchbasedn: The base DN of the tree used to start the search (will do a subtree search from here).</p> <p>ldapconfigurationusersearchfilter: The LDAP filter used.</p> <p>password: The password for the username to be tested.</p> <p>username: The username to be tested.</p>

## Link Layer Discovery Protocol (LLDP) commands

You can set up LLDP to enable network devices to communicate on a LAN.

### sfcli Lldp getconfig <options>

Description	Options
This command enables you to retrieve the current LLDP configuration for this node.	None

### sfcli Lldp setconfig <options>

Description	Options
This command enables you to set LLDP configuration options. If an option is not set in the request the values remain unchanged.	<p>enablelldp: Enable the LLDP service.</p> <p>enablemed: Enable MED, an extension to LLDP that provides inventory information for NetApp HCI products.</p> <p>enableotherprotocols: Enable other discovery protocols: CDP, FDP, EDP, and SONMP.</p> <p>lldpconfig: Enable the LLDP service.</p>

## Logging session commands

You can use the commands in this section to perform operations, such as setting the duration for which the login authentication is valid for a session. After the specified duration elapses, you need to reenter login credentials to continue to access the cluster.

### sfcli Logging getloginsessioninfo <options>

Description	Options
This command enables you to return the period of time a log in authentication session is valid for both login shells and the TUI.	None

### sfcli Logging getremotehosts <options>

Description	Options
This command enables you to retrieve the current list of log servers.	None

### sfcli Logging setloginsessioninfo <options>

Description	Options
This command enables you to set the period of time that a session's login authentication is valid. After the log in period elapses without activity on the system, the authentication expires. New login credentials are required for continued access to the cluster after the timeout period has elapsed.	<p>timeout: Cluster authentication expiration period. Formatted in HH:mm:ss. For example, 01:30:00, 00:90:00, and 00:00:5400 can be used to equal a 90 minute timeout period. The default value is 30 minutes. The minimum value is 1 minute.</p>

**sfcli Logging setremotehosts <options>**

Description	Options
This command enables you to configure remote logging from the nodes in the storage cluster to a centralized log server or servers. Remote logging is performed over TCP using the default port 514. This command does not add to the existing logging hosts. Rather, it replaces what currently exists with new values specified.	remotehosts: List of hosts to receive log messages. host: Specify the host name or IP address of the log server. port: Specify the port number to which the log server is listening.

## Network commands

You can use the commands in this section to perform operations, such as getting information about the Fibre Channel and iSCSI sessions on your cluster.

**sfcli Network listfibrechannelportinfo <options>**

Description	Options
This command enables you to retrieve information about the Fibre Channel ports on a node. It is intended for use on individual nodes; userid and password authentication is required for access to individual Fibre Channel nodes.	None

**sfcli Network listfibrechannelsessions <options>**

Description	Options
This command enables you to retrieve information about the active Fibre Channel sessions on a cluster.	None

**sfcli Network listinterfaces <options>**

Description	Options
This command enables you to retrieve information about each network interface on a node. It is intended for use on individual nodes; userid and password authentication is required for access to individual nodes.	None

**sfcli Network listiscsisessions <options>**

Description	Options
This command enables you to return iSCSI information for volumes in the cluster.	None

**sfcli Network listnodefibrechannelportinfo <options>**

Description	Options
This command enables you to retrieve information about the Fibre Channel ports on a node. It is intended for use on individual nodes; userid and password authentication is required for access to individual Fibre Channel nodes.	None

## Node commands

You can use the commands in this section to perform operations, such as adding nodes to a cluster, removing nodes from a cluster, setting the network configuration for a node, and so on.

### sfcli disableautoip <options>

Description	Options
This command can disable automatic IP assignment for a node.	None

### sfcli enableautoip <options>

Description	Options
This command can enable automatic IP assignment for a node.	None

### sfcli Node add <options>

Description	Options
<p>This command enables you to add one or more new nodes to a cluster. When a node that is not configured starts up for the first time, you are prompted to configure the node. After you configure the node, it is registered as a "pending node" with the cluster.</p> <p><b>Note:</b> It might take several seconds after adding a new node for it to start up and register its drives as available.</p>	<p><b>autoinstall:</b> Specifies whether the nodes should be auto-installed.</p> <p><b>pendingnodes:</b> List of pending NodeIDs for the nodes to be added. You can obtain the list of pending nodes using the <code>sfcli Node listpending &lt;options&gt;</code> command. This option is required.</p>

**sfcli Node checkpingonvlan <options>**

Description	Options
<p>This command provides the ability to test IP address(s) reachability on a not-yet-configured VLAN.</p> <p>This command creates a temporary VLAN interface, uses it to ping the provided list of host IP addresses, and then removes the VLAN interface.</p> <p>If the VLAN interface already exists, use the <code>Test ping</code> command instead.</p>	<p><code>attempts</code>: Specifies the number of times the system should repeat the test ping.</p> <p><code>hosts</code>: Specifies a string containing comma separated IP addresses whose reachability needs to be tested. This option is required.</p> <p><code>interface</code>: Specifies an existing interface on which the temporary VLAN interface is created. Possible values are <code>Bond10G</code> and <code>Bond1G</code>. This option is required.</p> <p><code>packetSize</code>: Specifies the number of bytes to send in the ICMP packet that is sent to each IP. The number of bytes must be less than the maximum MTU specified in the network configuration.</p> <p><code>pingTimeoutMsec</code>: Specifies the number of bytes to send in the ICMP packet that is sent to each IP. The number of bytes must be less than the maximum MTU specified in the network configuration.</p> <p><code>prohibitFragmentation</code>: Enables the DF (Do not Fragment) flag for the ICMP packets.</p> <p><code>sourceAddressV4</code>: Specifies the IPv4 source address to be used in the ICMP ping packets. Specifying either <code>sourceAddressV4</code> or <code>sourceAddressV6</code> is required.</p> <p><code>sourceAddressV6</code>: Specifies the IPv6 source address to be used in the ICMP ping packets. Specifying either <code>sourceAddressV4</code> or <code>sourceAddressV6</code> is required.</p> <p><code>totalTimeoutSec</code>: Specifies the time in seconds the ping should wait for a system response before issuing the next ping attempt or ending the process.</p> <p><code>virtualNetworkTag</code>: Specifies the VLAN on which host addresses reachability needs to be tested. The temporary VLAN interface is created with this tag. This option is required.</p>

**sfcli Node checkproposedcluster <options>**

Description	Options
<p>This command validates that creating a cluster from a given set of nodes is likely to succeed. Any problems with the proposed cluster are returned as errors with a human-readable description and unique error code.</p>	<p><code>nodes</code>: Specifies the list of node IPs for the nodes in the new cluster.</p>



**sfcli Node controlpower <options>**

Description	Options
This command can reboot or halt a node.	<p><b>action:</b> Specifies the action to take, either <code>Halt</code> or <code>Restart</code>.</p> <p><b>force:</b> Required for the command to succeed.</p> <p><b>wakeupDelay:</b> Specifies the delay in seconds to wait before powering on. This is only usable when the action is <code>Halt</code>.</p>

**sfcli Node getactivetlsiphers <options>**

Description	Options
This command gets a list of the Transport Layer Security (TLS) ciphers that are currently accepted on the cluster.	None

**sfcli Node getbootstrapconfig <options>**

Description	Options
This command returns cluster and node information from the bootstrap configuration file. Use this command on an individual node before it has been joined with a cluster. You can use the information you get in the cluster configuration interface when you create a cluster.	None

**sfcli Node getconfig <options>**

Description	Options
This command enables you to retrieve all configuration information for a node.	None

**sfcli Node getfipsdrivesreport <options>**

Description	Options
This command reports the FipsDrives capability of a node. This is a per-node command.	None

**sfcli Node getnetworkconfig <options>**

Description	Options
This command enables you to display the network configuration information for a node.	None

**sfcli Node getorigin <options>**

Description	Options
This command enables you to retrieve the origination certificate for where the node was built. It might return <code>null</code> if there is no origination certification.	None

**sfcli Node getpendingoperation <options>**

Description	Options
You can use this command to detect an operation on a node that is currently in progress. You can also use this to report back when an operation has completed.	None

**sfcli Node getsslcertificate <options>**

Description	Options
This command enables you to retrieve the SSL certificate that is currently active on the management node.	None

**sfcli Node getstats <options>**

Description	Options
This command enables you to retrieve the high-level activity measurements for a single node.	nodeid: Specifies the node for which statistics are gathered.

**sfcli Node getsupportedtlsciphers <options>**

Description	Options
This command gets a list of the TLS ciphers on this node. You can use this command on both management and storage nodes.	No options available.

**sfcli Node listactive <options>**

Description	Options
This command returns the list of currently active nodes that are in the cluster.	None

**sfcli Node listall <options>**

Description	Options
This command enables you to retrieve a list of active and pending nodes in the cluster.	None

**sfcli Node listpending <options>**

Description	Options
This command returns a list of the currently pending nodes in the system.	None

**sfcli Node listpendingactive <options>**

Description	Options
This command returns the list of nodes in the cluster that are currently in the PendingActive state, between the pending and active states. These are nodes that are currently being returned to the factory image.	None

**sfcli Node liststats <options>**

Description	Options
This command enables you to view the high-level activity measurements for all nodes in a cluster.	None

**sfcli Node remove <options>**

Description	Options
This command enables you to remove one or more nodes that should no longer participate in the cluster. Before removing a node, you must remove all drives the node contains. You cannot remove a node until the process to remove drives has completed and all data has been migrated away from the node.	nodes: List of NodeIDs for the nodes to be removed.

After you remove a node, it registers itself as a pending node. You can add the node again or shut it down (shutting the node down removes it from the *Pending Node* list).

**sfcli Node removesslcertificate <options>**

Description	Options
This command enables you to remove the user SSL certificate and private key for the management node. After the certificate and private key are removed, the management node is configured to use the default certificate and private key.	None

**sfcli Node resetnetworkconfig <options>**

Description	Options
This command can reset the network configuration for a node.	None

**sfcli Node resetsupplementaltlsciphers <options>**

Description	Options
This command can restore the supplemental ciphers to their defaults. You can use this command on management nodes.	None

**sfcli Node setconfig <options>**

Description	Options
This command enables you to set all the configuration information for the node.	config: Objects that you want changed for the cluster interface settings.



**CAUTION:** Changing the "bond-mode" on a node can cause a temporary loss of network connectivity. Exercise caution when using this command.

**sfcli setlldpconfig <options>**

Description	Options
This command sets LLDP configuration options. If an option is not set in the request, then it is unchanged from the previous value.	<p><code>enableLldp</code>: Enables or disables LLDP entirely.</p> <p><code>enableMed</code>: Enable or disable MED, an extension to LLDP that provides inventory information for NetApp HCI product.</p> <p><code>enableOtherProtocols</code>: Enable other discovery protocols: CDP, FDP, EDP, and SONMP.</p>

**sfcli Node setnetworkconfig <options>**

Description	Options
This command enables you to set the network configuration for a node.	<code>network</code> : An object containing node network settings to modify.



**CAUTION:** Changing the "bond-mode" on a node can cause a temporary loss of network connectivity. Exercise caution when using this command.

**sfcli Node setsslcertificate <options>**

Description	Options
This command enables you to set a user SSL certificate and private key for the management node.	<p><code>certificate</code>: The PEM-encoded text version of the certificate.</p> <p><code>privatekey</code>: The PEM-encoded text version of the private key.</p>

**sfcli Node setsupplementaltlsciphers <options>**

Description	Options
This command lists the supplemental TLS ciphers for this node. You can use this command on management nodes.	<code>supplementalCiphers</code> : Specifies the supplemental cipher suite names using the OpenSSL naming scheme. Use of cipher suite names is case-insensitive.

## Pairing commands

You can use the commands in the section to perform operations, such as complete the pairing between two volumes, remove the pairing between two volumes, and so on.

### sfcli Pairing completecluster <options>

Description	Options
You can use this command with the <code>sfcli Pairing startcluster &lt;options&gt;</code> command to complete the cluster pairing process.	<code>clusterpairingkey</code> : A string of characters that is returned from the <code>sfcli Pairing startcluster &lt;options&gt;</code> command.

### sfcli Pairing completevolume <options>

Description	Options
This command enables you to complete the pairing of two volumes.	<code>volumeid</code> : The ID of the volume on which to complete the pairing process. <code>volumepairingkey</code> : The key returned from the <code>sfcli Pairing startvolume &lt;options&gt;</code> command.

### sfcli Pairing listactivepairedvolumes <options>

Description	Options
This command enables you to list all the active volumes paired with a volume. You get information about volumes with active and pending pairings.	<code>limit</code> : Specifies the maximum number of active paired volumes to return. <code>startvolumeid</code> : Specifies the beginning of the range of active paired volumes to return.

### sfcli Pairing listclusterpairs <options>

Description	Options
This command enables you to list all the clusters that a cluster is paired with. It returns information about active and pending cluster pairings, such as statistics about the current pairing as well as the connectivity and latency (in milliseconds) of the cluster pairing.	None

**sfcli Pairing modifyvolumepair <options>**

Description	Options
<p>This command enables you to pause or restart replication between a pair of volumes.</p>	<p>mode: Specifies the volume replication mode. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>Async</code>: Writes are acknowledged when they complete locally. The cluster does not wait for writes to be replicated to the target cluster.</li> <li>• <code>Sync</code>: The source acknowledges the write when the data is stored locally and on the remote cluster.</li> <li>• <code>SnapshotsOnly</code>: Only snapshots created on the source cluster are replicated. Active writes from the source volume are not replicated.</li> </ul> <p>pausedmanual: Specifies whether to pause or restart volume replication process. Valid values are: true (pauses volume replication) or false (restarts volume replication). If you do not specify a value, no change in replication is performed.</p> <p>volumeid: The ID of the volume to be modified.</p>

**sfcli Pairing removeclusterpair <options>**

Description	Options
<p>This command enables you to close the open connections between two paired clusters.</p> <p><b>Note:</b> Before you remove a cluster pair, you must first remove all volume pairing to the clusters.</p>	<p>clusterpairingid: Unique identifier used to pair two clusters.</p>

**sfcli Pairing removevolumepair <options>**

Description	Options
<p>This command enables you to remove the remote pairing between two volumes. Use this command on both the source and target volumes that are paired together. When you remove the volume pairing information, data is no longer replicated to or from the volume.</p>	<p>volumeid: The ID of the volume on which to stop the replication process.</p>

**sfcli Pairing startcluster <options>**

Description	Options
<p>This command enables you to create an encoded key from a cluster that is used to pair with another cluster. You can use this key with the key you get when you run <code>sfcli Pairing completecluster &lt;options&gt;</code> to establish a cluster pairing. You can pair a cluster with a maximum of four other clusters.</p>	<p>None</p>


**sfcli Pairing startvolume <options>**

Description	Options
<p>This command enables you to create an encoded key from a volume that is used to pair with another volume.</p>	<p>mode: The mode of the volume on which to start the pairing process. The mode can only be set if the volume is the source volume. Possible values are: volumeid ( ID of the volume on which to start the pairing process), mode (mode of the volume on which to start the pairing process). The mode can only be set if the volume is the source volume.</p> <p>Possible values for mode are:</p> <ul style="list-style-type: none"> <li>• <b>Async:</b> (default if no mode parameter specified) Writes are acknowledged when they complete locally. The cluster does not wait for writes to be replicated to the target cluster.</li> <li>• <b>Sync:</b> Source acknowledges write when the data is stored locally and on the remote cluster.</li> <li>• <b>SnapshotsOnly:</b> Only snapshots created on the source cluster are replicated. Active writes from the source volume are not replicated.</li> </ul> <p>volumeid: The ID of the volume on which to start the pairing process.</p>


**Restart commands**

You can use the commands in this section to perform operations, such as restarting a node, restarting the networking services on a node, and so on.

**sfcli Restart networking <options>**

Description	Options
<p>This command enables you to restart the networking services on a node.</p> <div style="display: flex; align-items: center;">  <p><b>CAUTION:</b> This command restarts all networking services on a node, causing temporary loss of networking connectivity. Exercise caution when using this command.</p> </div>	<p>force: Required parameter to successfully restart the node.</p>

**sfcli Restart resetnode <options>**

Description	Options
<p>This command enables you to reset a node to the factory settings. All data, packages (software upgrades, and so on), configurations, and log files are deleted from the node when you use this command. However, network settings for the node are preserved during this operation. Nodes that are participating in a cluster cannot be reset to the factory settings. This command can only be used on nodes that are in an "Available" state. It cannot be used on nodes that are "Active" in a cluster, or in a "Pending" state.</p> <p> <b>CAUTION:</b> Exercise caution when using this command, because it clears any data that is on the node.</p>	<p><b>build:</b> Specifies the URL to a remote Element software image to which the node will be reset.</p> <p><b>force:</b> Required parameter to successfully reset the node.</p> <p><b>options:</b> Specifications for running the reset operation. Details will be provided by NetApp Support, if required.</p> <p><b>reboot:</b> Set to true if you want to reboot the node.</p>

**sfcli Restart shutdown <options>**

Description	Options
<p>This command enables you to restart or shutdown a node that has not yet been added to a cluster. To use this command, log in to the MIP for the pending node, and run this command with either the <code>restart</code> or <code>halt</code> options.</p>	<p><b>nodes:</b> List of NodeIDs for the nodes to be shut down.</p> <p><b>option:</b> Specifies the action to take for the node shutdown. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>restart</code>: Restarts the node.</li> <li>• <code>halt</code>: Shuts down the node.</li> </ul>

## Schedule commands

You can use the commands in this section to get a schedule or list available schedules.

**sfcli Schedule get <options>**

Description	Options
<p>This command enables you to retrieve information about a scheduled snapshot. You can see information about a specific schedule if there are many snapshot schedules in the system. You also retrieve information about more than one schedule with this command by specifying the <code>scheduleid</code> option.</p>	<p><b>scheduleid:</b> Specifies the unique ID of the schedule or multiple schedules to display.</p>

**sfcli Schedule list <options>**

Description	Options
<p>This command enables you to retrieve information about all scheduled snapshots that have been created.</p>	<p>None</p>



## Security commands

Use the commands in this section to perform security operations for ciphers, key servers, and key providers.

### sfcli Security addkeyservertoproviderkmip <options>

Description	Options
<p>This command assigns the specified Key Management Interoperability Protocol (KMIP) key server to the specified key provider. This will contact the server to verify it is functional and synchronize keys when there are multiple key servers assigned to the provider. This synchronization might fail due to conflicts. If the specified KMIP key server is already assigned to the specified key provider, nothing happens and no error is returned. You can unassign the KMIP using the <code>Security removekeyserverfromproviderkmip</code> command.</p>	<p><code>keyProviderID</code>: Specifies the ID of the key provider for assignment to the key server.</p> <p><code>keyServerID</code>: Specifies the ID of the KMIP key server for the assignment to the key provider.</p>

### sfcli Security createkeyproviderkmip <options>

Description	Options
<p>This command creates a KMIP key provider with the specified name. A key provider defines a mechanism and location to retrieve authentication keys. A KMIP key provider represents a collection of one or more KMIP key servers. A newly created KMIP key provider will not have any KMIP key servers assigned to it. To create a KMIP key server, see <code>Key createserverkmip</code>, and assign it to a provider using <code>Key addservertoproviderkmip</code>.</p>	<p><code>keyProviderName</code>: Specifies the name to associate with the created KMIP key provider. This name is only used for display purposes and does not need to be unique.</p>

**sfcli Security createkeyserverkmip <options>**

Description	Options
<p>This command creates a KMIP key server with the specified attributes. The server will not be contacted as part of this operation so it does not need to exist or be configured prior to running this command.</p> <p>For clustered key server configurations, you must provide the host names or IP addresses of all server nodes in the <code>kmipKeyServerHostnames</code> parameter.</p>	<p><code>kmipCaCertificate</code>: Specifies the public key certificate of the external key server's root CA. This will be used to verify the certificate presented by the external key server in the TLS communication. For key server clusters where individual servers use different CAs, provide a concatenated string containing the root certificates of all the CAs.</p> <p><code>kmipClientCertificate</code>: Specifies a PEM format Base64 encoded PKCS#10 X.509 certificate used by the KMIP client.</p> <p><code>kmipKeyServerHostnames</code>: Specifies an array of the host names or IP addresses associated with this KMIP key server. Only provide multiple host names or IP addresses if the key servers are in a clustered configuration.</p> <p><code>kmipKeyServerName</code>: Specifies the name of the KMIP key server. This name is only used for display purposes and does not need to be unique.</p> <p><code>kmipKeyServerPort</code>: Specifies the port number associated with this KMIP key server (typically 5696). This item is optional.</p>

**sfcli Security createpublicprivatekeypair <options>**

Description	Options
<p>This command creates SSL public and private keys. You can use these keys to generate certificate signing requests. There can be only one key pair in use for the cluster. To replace the existing keys, make sure that they are not being used by any providers before running this command.</p>	<p><code>commonName</code>: Specifies the X.509 distinguished name Common Name field (CN).</p> <p><code>country</code>: Specifies the X.509 distinguished name Country field (C).</p> <p><code>emailAddress</code>: Specifies the X.509 distinguished name Email Address field (MAIL).</p> <p><code>locality</code>: Specifies the X.509 distinguished name Locality Name field (L).</p> <p><code>organization</code>: Specifies the X.509 distinguished name Organization Name field (O).</p> <p><code>organizationalUnit</code>: Specifies the X.509 distinguished name Organizational Unit Name field (OU).</p> <p><code>state</code>: Specifies the X.509 distinguished name State or Province Name field (ST or SP or S).</p>

**sfcli Security deletekeyproviderkmip <options>**

Description	Options
This command removes the specified inactive key provider.	keyProviderID: Specifies the ID of the key provider to delete.

**sfcli Security deletekeyserverkmip <options>**

Description	Options
This command removes the specified KMIP key server. You can delete a KMIP key server unless it is the last one assigned to its provider and that provider is active (providing keys which are currently in use).	keyProviderID: Specifies the ID of the KMIP key server to delete.

**sfcli Security getclientcertificatesignrequest <options>**

Description	Options
This command generates a certificate signing request which can be signed by a Certificate Authority to generate a client certificate for the cluster. This is part of establishing a trust relationship for interacting with external services.	No options available.

**sfcli Security getfipsreport <options>**

Description	Options
This command enables you to retrieve FIPS compliance status on a per node basis.	None

**sfcli Security getkeyproviderkmip <options>**

Description	Options
This command returns the specified KMIP key provider object.	keyProviderID: Specifies the ID of the KMIP key provider object to return.

**sfcli Security getkeyserverkmip <options>**

Description	Options
This command returns the specified KMIP key server object.	keyServerID: Specifies the ID of the KMIP key server object to return.

**sfcli Security listkeyproviderskmip <options>**

Description	Options
<p>This command returns the list of KMIP key providers that were created using the <code>Key createproviderkmip</code> command. You can filter this list using the options.</p>	<p><code>keyProviderIsActive</code>: If true, returns only KMIP key provider objects which are active (providing keys which are currently in use). If false, returns only KMIP key provider objects which are inactive (not providing any keys and able to be deleted). If omitted completely, the active/inactive state is not considered in the returned list of KMIP key providers.</p> <p><code>kmipKeyProviderHasServerAssigned</code>: If true, returns only KMIP key provider objects which have a KMIP key server assigned. If false, returns only KMIP key provider objects which do not have a KMIP key server assigned. If omitted completely, server assignment is not considered in the returned list of KMIP key providers.</p>

**sfcli Security listkeyserverskmip <options>**

Description	Options
<p>This command returns the list of KMIP key servers that were created using the <code>Key createserverkmip</code> command. You can filter this list using the options.</p>	<p><code>keyProviderID</code>: If specified, returned KMIP key server objects are filtered to those assigned to the specified KMIP key provider.</p> <p><code>kmipAssignedProviderIsActive</code>: If true, returns only KMIP key server objects which are active (providing keys which are currently in use). If false, returns only KMIP key server objects which are inactive (not providing any keys and able to be deleted). If omitted completely, KMIP key server objects are not filtered based on whether they are active.</p> <p><code>kmipHasProviderAssigned</code>: If true, returns only KMIP key server objects which have a KMIP key provider assigned. If false, returns only KMIP key server objects which do not have a KMIP key provider assigned. If omitted completely, KMIP key server objects are not filtered based on whether they have a KMIP key provider assigned.</p>

**sfcli Security modifykeyserverkmip <options>**

Description	Options
<p>This command changes a KMIP key server to the specified attributes. The only required parameter is the <code>keyServerID</code>. A request which contains only the <code>keyServerID</code> will do nothing and no error will be returned.</p> <p>Any other parameters which are specified will replace the existing values on the KMIP key server with the specified <code>keyServerID</code>. Because this server might be part of an active provider, this command contacts the server to verify it is functional.</p> <p>Only provide multiple host names or IP addresses in the <code>kmipKeyServerHostnames</code> parameter if the key servers are in a clustered configuration.</p>	<p><code>keyServerID</code>: Specifies the KMIP key server to modify. This option is required.</p> <p><code>kmipCaCertificate</code>: Specifies the public key certificate of the external key server's root CA. This will be used to verify the certificate presented by external key server in the TLS communication. For key server clusters where individual servers use different CAs, provide a concatenated string containing the root certificates of all the CAs.</p> <p><code>kmipClientCertificate</code>: Specifies a PEM format Base64 encoded PKCS#10 X.509 certificate used by the Solidfire KMIP client.</p> <p><code>kmipKeyServerHostnames</code>: Specifies an array of the host names or IP addresses associated with this KMIP key server. Multiple host names or IP addresses must only be provided if the key servers are in a clustered configuration.</p> <p><code>kmipKeyName</code>: Specifies the name of the KMIP key server. This name is only used for display purposes and does not need to be unique.</p> <p><code>kmipKeyServerPort</code>: Specifies the port number associated with this KMIP key server (typically 5696).</p>

**sfcli Security removekeyserverfromproviderkmip <options>**

Description	Options
<p>This command unassigns the specified KMIP key server from the provider it was assigned to via the <code>Security AddKeyServerToProviderK mip</code> command, if any. A KMIP key server can be unassigned from its provider unless it is the last one and that provider is active (providing keys which are currently in use). If the specified KMIP key server is not assigned to a provider, nothing happens and no error is returned.</p>	<p><code>keyServerID</code>: Specifies the ID of the KMIP key server to unassign.</p>

**sfcli Security testkeyproviderkmip <options>**

Description	Options
<p>This command tests whether the specified KMIP Key Provider is functioning normally.</p>	<p><code>keyServerID</code>: Specifies the ID of the KMIP key provider to test.</p>

**sfcli Security testkeyserverkmip <options>**

Description	Options
<p>This command tests whether the specified KMIP Key Server is functioning normally.</p>	<p><code>keyServerID</code>: Specifies the ID of the KMIP key server to test.</p>

## Sensor commands

You can use the commands in this section to get hardware information from the sensors in your node. You can get detailed reporting of sensors for node fans, power supplies, and so on.

### sfcli Sensors getipmiconfig <options>

Description	Options
This command enables you to retrieve hardware sensor information from sensors that are in your node.	<p>chassistype: Displays information for each node chassis type. Valid values are:</p> <ul style="list-style-type: none"> <li>all: (returns sensor information for each chassis type.</li> <li>{chassis type}: Returns sensor information for a specified chassis type.</li> </ul>

### sfcli Sensors getipmiinfo <options>

Description	Options
This command enables you to display a detailed reporting of sensors (objects) for node fans, intake and exhaust temperatures, and power supplies that are monitored by the system.	None

## Service command

You can use the command in this section to get service information for the nodes and drives on your cluster.

### sfcli Service list <options>

Description	Options
This command enables you to return the services information for nodes, drives, current software, and other services that are running on the cluster.	None

### sfcli Service restart <options>

Description	Options
<p>This command enables you to restart the services on a node. Caution: This command causes temporary node services interruption. Exercise caution when using this command.</p> <p><b>Note:</b> This command is available only through the per-node API endpoint 5.0 or later.</p>	<p>action: Specifies the action to perform. Possible values:</p> <ul style="list-style-type: none"> <li>restart</li> <li>start</li> <li>stop</li> </ul> <p>force: This is a required parameter to successfully restart services on a node.</p> <p>service: Specifies the service to restart.</p>

## SnapMirror commands

Use the commands in this section to perform SnapMirror operations, such as create a SnapMirror relationship, list SnapMirror nodes, modify SnapMirror endpoints, and so on.

### sfcli SnapMirror abortrelationship <options>

Description	Options
<p>This command stops SnapMirror transfers that have started but are not yet complete.</p>	<p><code>clearcheckpoint</code>: Determines whether to clear the restart checkpoint. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>true</code>: Clear the checkpoint.</li> <li>• <code>false</code>: Do not clear the checkpoint.</li> </ul> <p>This is optional.</p> <p><code>snapmirrorendpointid</code>: Specifies the endpoint ID of the remote ONTAP storage system communicating with the Element storage cluster.</p> <p><code>snapmirrorvolumeinfo</code>: If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume. If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the SVM that owns the volume.</p> <p><code>snapmirrorvolumeinfo</code> name: Specifies the name of the volume.</p> <p><code>snapmirrorvolumeinfo</code> type: Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>solidfire</code>: The volume resides on a SolidFire cluster.</li> <li>• <code>ontap</code>: The volume resides on a remote ONTAP cluster.</li> </ul> <p><code>volumeid</code>: If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume.</p> <p><code>vserver</code>: If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the Vserver that owns this volume.</p>

**sfcli SnapMirror breakrelationship <options>**

Description	Options
<p>This command breaks a SnapMirror relationship. When a SnapMirror relationship is broken, the destination volume is made read-write and independent, and can then diverge from the source. You can reestablish the relationship with the <code>SnapMirror ResyncRelationship</code> command. This command requires the ONTAP cluster to be available.</p>	<p><code>snapmirrorendpointid</code>: Specifies the endpoint ID of the remote ONTAP storage system communicating with the Element storage cluster. This option is required.</p> <p><code>snapmirrorvolumeinfo</code>: If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume. If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the SVM that owns the volume.</p> <p><code>snapmirrorvolumeinfo</code> name: Specifies the name of the volume.</p> <p><code>snapmirrorvolumeinfo</code> type: Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>solidfire</code>: The volume resides on a SolidFire cluster.</li> <li>• <code>ontap</code>: The volume resides on a remote ONTAP cluster.</li> </ul> <p><code>volumeid</code>: If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume.</p> <p><code>vserver</code>: If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the Vserver that owns this volume.</p>



**sfcli SnapMirror breakvolume <options>**

Description	Options
<p>This command breaks the SnapMirror relationship between an ONTAP source container and Element target volume. Breaking an Element SnapMirror volume is useful if an ONTAP system becomes unavailable while replicating data to an Element volume. This feature enables a storage administrator to take control of an Element SnapMirror volume, break its relationship with the remote ONTAP system, and revert the volume to a previous Snapshot copy.</p>	<p><b>access:</b> Specifies the resulting volume access mode. Possible values:</p> <ul style="list-style-type: none"> <li>• readWrite</li> <li>• readOnly</li> <li>• locked</li> </ul> <p><b>preserve:</b> Preserve any Snapshot copies newer than the Snapshot copy identified by the snapshotID. Possible values:</p> <ul style="list-style-type: none"> <li>• true: Preserve Snapshot copies newer than snapshotID.</li> <li>• false: Do not preserve Snapshot copies newer than snapshotID.</li> </ul> <p>If false, any Snapshot copies newer than snapshotID are deleted.</p> <p><b>snapshotID:</b> Indicates the Snapshot copy to use to revert the volume. The default behavior is to roll back to the most recent Snapshot copy.</p> <p><b>volumeID:</b> Specifies the volume on which to perform the break operation. The volume access mode must be snapMirrorTarget. This option is required.</p>

**sfcli SnapMirror createendpoint <options>**

Description	Options
<p>This command creates a relationship with a remote SnapMirror endpoint.</p>	<p><b>managementip:</b> Specifies the management IP address of the remote SnapMirror endpoint. This option is required.</p> <p><b>password:</b> Specifies the management password for the ONTAP system. This option is required.</p> <p><b>username:</b> Specifies the management user name for the ONTAP system. This option is required.</p>

**sfcli SnapMirror createendpointunmanaged <options>**

Description	Options
<p>This command enables remote, unmanaged SnapMirror endpoints to communicate with an Element storage cluster. Unmanaged endpoints cannot be administered using the Element SnapMirror APIs. They must be managed with ONTAP management software or APIs.</p>	<p><b>clustername:</b> Specifies the name of the endpoint. This option is required.</p> <p><b>ipaddresses:</b> Specifies the list of IP addresses for a cluster of ONTAP storage systems that should communicate with this Element storage cluster. This option is required.</p>

**sfcli SnapMirror createrelationship <options>**

Description	Options
<p>This command creates a SnapMirror extended data protection relationship between a source and destination endpoint.</p>	<p><b>maxtransferrate:</b> Specifies the maximum data transfer rate between the volumes in kilobytes per second. The default value, 0, is unlimited and permits the SnapMirror relationship to fully utilize the available network bandwidth.</p> <p><b>policyname:</b> Specifies the name of the ONTAP SnapMirror policy for the relationship. If not specified, the default policy name is <code>MirrorLatest</code>.</p> <p><b>relationshiptype:</b> Specifies the type of relationship. On storage systems running Element software, this value is always <code>extended_data_protection</code>.</p> <p><b>schedulename:</b> Specifies the name of the preexisting cron schedule on the ONTAP system that is used to update the SnapMirror relationship. If no schedule is designated, SnapMirror updates are not scheduled and must be updated manually.</p> <p><b>snapmirrorendpointid:</b> Specifies the endpoint ID of the remote ONTAP storage system communicating with the Element storage cluster. This option is required.</p> <p><b>snapmirrorvolumeinfo:</b> If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume. If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the SVM that owns the volume.</p> <p><b>snapmirrorvolumeinfo</b><code>namedestination</code><code>volume: Specifies the name of the volume.</code></p> <p><b>snapmirrorvolumeinfo</b><code>typedestination</code><code>volume: Specifies the type of volume. Possible values:</code></p> <ul style="list-style-type: none"> <li>• <code>solidfire:</code> The volume resides on a SolidFire cluster.</li> <li>• <code>ontap:</code> The volume resides on a remote ONTAP cluster.</li> </ul> <p><b>volumeid</b><code>destination</code><code>volume: If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume.</code></p> <p><b>vserver</b><code>destination</code><code>volume: If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the Vserver that owns this volume.</code></p> <p><b>snapmirrorvolumeinfo</b><code>namesource</code><code>volume:</code> Specifies the name of the volume.</p> <p><b>snapmirrorvolumeinfo</b><code>typesource</code><code>volume:</code> Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>solidfire:</code> The volume resides on a</li> </ul>

**sfcli SnapMirror createvolume <options>**

Description	Options
<p>This command creates a volume on the remote ONTAP system.</p>	<p><b>aggregate:</b> Specifies the containing ONTAP aggregate in which to create the volume. You can use <code>SnapMirror ListAggregates</code> command to get information about available ONTAP aggregates. This option is required.</p> <p><b>name:</b> Specifies the destination ONTAP volume name. This option is required.</p> <p>If no type is specified, the volume type is the default, which is <code>dp</code>.</p> <p><b>size:</b> The size of the volume in bytes.</p> <p><b>snapmirrorendpointid:</b> Specifies the endpoint ID of the remote ONTAP storage system communicating with the Element storage cluster. This option is required.</p> <p><b>type:</b> Specifies the type of volume. Possible values include:</p> <ul style="list-style-type: none"> <li>• <code>rw</code>: Read-write volume</li> <li>• <code>ls</code>: Load-sharing volume</li> <li>• <code>dp</code>: Data protection volume</li> </ul> <p><b>vserver:</b> Specifies the name of the Vserver. This option is required.</p>

**sfcli SnapMirror deleteendpoints <options>**

Description	Options
<p>This command deletes one or more SnapMirror endpoints from the system.</p>	<p><b>snapmirrorendpointid:</b> Specifies an array of IDs of SnapMirror endpoints to delete. This option is required.</p>

**sfcli SnapMirror deleterelationships <options>**

Description	Options
<p>This command removes one or more SnapMirror relationships between a source and destination endpoint.</p>	<p><code>destinationvolumes</code>: Specifies the destination volume or volumes in the SnapMirror relationship. This option is required.</p> <p><code>name</code>: Specifies the name of the volume.</p> <p><code>snapmirrorendpointid</code>: Specifies the endpoint ID of the remote ONTAP storage system communicating with the Element storage cluster. This option is required.</p> <p><code>type</code>: Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>solidfire</code>: The volume resides on a SolidFire cluster.</li> <li>• <code>ontap</code>: The volume resides on a remote ONTAP cluster.</li> </ul> <p><code>volumeid</code>: Specifies the ID of the volume. Only valid if <code>type</code> is <code>solidfire</code>.</p> <p><code>vserver</code>: Specifies the Vserver that owns this volume. Only valid if <code>type</code> is <code>ontap</code>.</p>

**sfcli SnapMirror getclusteridentity <options>**

Description	Options
<p>This command retrieves identity information about the ONTAP cluster.</p>	<p><code>snapmirrorendpointid</code>: If provided, the system lists the cluster identity of the specified SnapMirror endpoint. If not provided, the system lists the cluster identity of all known SnapMirror endpoints.</p>

**sfcli SnapMirror getontapversioninfo <options>**

Description	Options
<p>This command retrieves information about API version support from the ONTAP cluster in a SnapMirror relationship.</p>	<p><code>snapmirrorendpointid</code>: If provided, the system lists the version information from the specified SnapMirror endpoint. If not provided, the system lists the version information of all known SnapMirror endpoints.</p>

**sfcli SnapMirror initializerelationship <options>**

Description	Options
<p>This command initializes the destination volume in a SnapMirror relationship by performing an initial baseline transfer between clusters.</p>	<p><code>maxTransferRate</code>: Specifies the maximum data transfer rate between the volumes in kilobytes per second. The default value, 0, is unlimited and permits the SnapMirror relationship to fully utilize the available network bandwidth. This is optional.</p> <p><code>snapmirrorendpointid</code>: Specifies the endpoint ID of the remote ONTAP storage system communicating with the Element storage cluster.</p> <p><code>snapmirrorvolumeinfo</code>: If the <code>snapmirrorvolumeinfotype</code> is <code>solidfire</code>, this specifies the ID of the volume. If the <code>snapmirrorvolumeinfotype</code> is <code>ontap</code>, this specifies the name of the SVM that owns the volume.</p> <p><code>snapmirrorvolumeinfoname</code>: Specifies the name of the volume.</p> <p><code>snapmirrorvolumeinfotype</code>: Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>solidfire</code>: The volume resides on a SolidFire cluster.</li> <li>• <code>ontap</code>: The volume resides on a remote ONTAP cluster.</li> </ul> <p><code>volumeid</code>: If the <code>snapmirrorvolumeinfotype</code> is <code>solidfire</code>, this specifies the ID of the volume.</p> <p><code>vserver</code>: If the <code>snapmirrorvolumeinfotype</code> is <code>ontap</code>, this specifies the name of the Vserver that owns this volume.</p>

**sfcli SnapMirror listaggregates <options>**

Description	Options
<p>This command retrieves a list of all SnapMirror aggregates that are available on the remote ONTAP system. An aggregate describes a set of physical storage resources.</p>	<p><code>snapmirrorendpointid</code>: If provided, returns only the aggregates associated with the specified endpoint ID. If not provided, the system lists aggregates from all known SnapMirror endpoints.</p>

**sfcli SnapMirror listendpoints <options>**

Description	Options
This command retrieves a list of all SnapMirror endpoints to which the Element storage cluster is communicating.	snapmirrorepointid: If provided, returns only the objects associated with the specified endpoint IDs. If not provided, the system lists all SnapMirror endpoint IDs.

**sfcli SnapMirror listluns <options>**

Description	Options
This command retrieves a list of the LUN information for the SnapMirror relationship from the remote ONTAP cluster.	<p>snapmirrorepointid: Specifies a list of the LUN information associated with the specified endpoint ID. This option is required.</p> <p>snapmirrorvolumeinfo: If the snapmirrorvolumeinfo type is solidfire, this specifies the ID of the volume. If the snapmirrorvolumeinfo type is ontap, this specifies the name of the SVM that owns the volume.</p> <p>snapmirrorvolumeinfo name: Specifies the name of the volume.</p> <p>snapmirrorvolumeinfo type: Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• solidfire: The volume resides on a SolidFire cluster.</li> <li>• ontap: The volume resides on a remote ONTAP cluster.</li> </ul> <p>volumeid: If the snapmirrorvolumeinfo type is solidfire, this specifies the ID of the volume.</p> <p>vserver: If the snapmirrorvolumeinfo type is ontap, this specifies the name of the Vserver that owns this volume.</p>

**sfcli SnapMirror listnetworkinterfaces <options>**

Description	Options
This command retrieves a list of all available SnapMirror interfaces on a remote ONTAP system.	<p>interfacerole: If provided, lists only the network interfaces serving the specified role. If not provided, lists all network interfaces, regardless of role.</p> <p>snapmirrorepointid: If provided, return only the network interfaces associated with the specified endpoint ID. If not provided, the system lists the network interfaces for all known SnapMirror endpoints.</p>

**sfcli SnapMirror listnodes <options>**

Description	Options
This command retrieves a list of nodes in a remote ONTAP cluster.	snapmirroendpointid: If provided, the system lists the nodes of the specified endpoint ID. If not provided, the system lists the nodes of all known SnapMirror endpoints.

**sfcli SnapMirror listpolicies <options>**

Description	Options
This command retrieves a list of all SnapMirror policies on a remote ONTAP system.	snapmirroendpointid: If provided, the system lists the policies associated with the specified endpoint ID. If not provided, the system lists the policies associated with all known SnapMirror endpoints.

**sfcli SnapMirror listrelationships <options>**

Description	Options
<p>This command retrieves a list of one or all SnapMirror relationships on an Element storage cluster.</p>	<p>relationshipid: Specifies the list of relationships associated with the specified relationship ID. This is optional.</p> <p>snapmirrorendpointid: If provided, the system lists the relationships associated with the specified endpoint ID. If not provided, the system lists the relationships associated with all known SnapMirror endpoints.</p> <p>snapmirrorvolumeinfonydestinationvolume: Specifies the name of the volume.</p> <p>snapmirrorvolumeinfotypedestinationvolume: Specifies the type of volume. Possible values are:</p> <ul style="list-style-type: none"> <li>• solidfire: The volume resides on a SolidFire cluster.</li> <li>• ontap: The volume resides on a remote ONTAP cluster.</li> </ul> <p>snapmirrorvolumeinfonysourcevolume: Specifies the name of the volume.</p> <p>snapmirrorvolumeinfotypesourcevolume: Specifies the type of volume. Possible values are:</p> <ul style="list-style-type: none"> <li>• solidfire: The volume resides on a SolidFire cluster.</li> <li>• ontap: The volume resides on a remote ONTAP cluster.</li> </ul> <p>snapmirrorvolumeinfovolumeiddestinationvolume: Specifies the ID of the volume. Only valid if snapmirrorvolumeinfotypedestinationvolume is solidfire.</p> <p>snapmirrorvolumeinfovserverdestinationvolume: Specifies the name of the VServer that owns this volume. Only valid if snapmirrorvolumeinfotypedestinationvolume is ontap.</p> <p>snapmirrorvolumeinfovolumeidsourcevolume: Specifies the ID of the volume. Only valid if snapmirrorvolumeinfotypedestinationvolume is solidfire.</p> <p>snapmirrorvolumeinfovserversourcevolume: Specifies the name of the VServer that owns this volume. Only valid if snapmirrorvolumeinfotypedestinationvolume is ontap.</p> <p>vserver: Specifies the list of relationships on the specified VServer. This is optional.</p>



**sfcli SnapMirror listschedules <options>**

Description	Options
<p>This command retrieves a list of schedules that are available on a remote ONTAP cluster.</p>	<p>snapmirroendpointid: If provided, the system lists the schedules of the specified endpoint ID. If not provided, the system lists the schedules of all known SnapMirror endpoints.</p>

**sfcli SnapMirror listvolumes <options>**

Description	Options
<p>This command retrieves a list of SnapMirror volumes available on a remote ONTAP system.</p>	<p>name: If provided, the system lists only ONTAP volumes with the specified name.</p> <p>snapmirroendpointid: If provided, the system lists only the volumes associated with the specified endpoint ID. If no endpoint ID is provided, the system lists volumes from all known SnapMirror endpoints.</p> <p>type: If provided, the system lists only ONTAP volumes of the specified type. Possible values include:</p> <ul style="list-style-type: none"> <li>• rw: Read-write volume</li> <li>• ls: Load-sharing volume</li> <li>• dp: Data protection volume</li> </ul> <p>vserver: If provided, the system lists the volumes hosted on the specified SVM. The SVM must be of type data.</p>

**sfcli SnapMirror listvservers <options>**

Description	Options
<p>This command retrieves a list of SnapMirror VServers available on a remote ONTAP system.</p>	<p>snapmirroendpointid: If provided, the system lists only the SVMs associated with the specified endpoint ID. If no endpoint ID is provided, the system lists SVMs from all known SnapMirror endpoints.</p> <p>vservername: If provided, the system lists only SVMs with the specified name.</p> <p>vservertype: If provided, the system lists only SVMs of the specified type. Possible values:</p> <ul style="list-style-type: none"> <li>• admin</li> <li>• data</li> <li>• node</li> <li>• system</li> </ul>

**sfcli SnapMirror modifyendpoint <options>**

Description	Options
<p>This command changes the name and management attributes for a SnapMirror endpoint.</p>	<p><b>managementip:</b> Specifies the new management IP address for the ONTAP system.</p> <p><b>password:</b> Specifies the new management password for the ONTAP system.</p> <p><b>snapmirrorendpointid:</b> Specifies the SnapMirror endpoint to modify. This option is required.</p> <p><b>username:</b> Specifies the new management user name for the ONTAP system.</p>

**sfcli SnapMirror modifyendpointunmanaged <options>**

Description	Options
<p>This command changes the storage cluster name or IP address attributes for an unmanaged SnapMirror endpoint. Unmanaged endpoints cannot be administered using the Element SnapMirror APIs. They must be managed with ONTAP management software or APIs.</p>	<p><b>clustername:</b> Specifies the new name of the endpoint.</p> <p><b>ipaddresses:</b> Specifies the new list of IP addresses for a cluster of ONTAP storage systems that should communicate with this Element storage cluster.</p> <p><b>snapmirrorendpointid:</b> Specifies the SnapMirror endpoint to modify. This option is required.</p>

**sfcli SnapMirror modifyrelationship <options>**

Description	Options
<p>This command changes the intervals at which a scheduled Snapshot copy occurs. You can also delete or pause a schedule by using this command.</p>	<p><b>maxtransferrate:</b> Specifies the maximum data transfer rate between the volumes in kilobytes per second. The default value, 0, is unlimited and permits the SnapMirror relationship to fully utilize the available network bandwidth.</p> <p><b>policyname:</b> Specifies the name of the preexisting cron schedule on the ONTAP system that is used to update the SnapMirror relationship.</p> <p><b>schedulename:</b> Specifies the name of the preexisting cron schedule on the ONTAP system that is used to update the SnapMirror relationship.</p> <p><b>snapmirrorendpointid:</b> Specifies the endpoint ID of the remote ONTAP storage system communicating with the Element storage cluster.</p> <p><b>snapmirrorvolumeinfo:</b> If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume. If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the SVM that owns the volume.</p> <p><b>snapmirrorvolumeinfo</b> name: Specifies the name of the volume.</p> <p><b>snapmirrorvolumeinfo</b> type: Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>solidfire</code>: The volume resides on a SolidFire cluster.</li> <li>• <code>ontap</code>: The volume resides on a remote ONTAP cluster.</li> </ul> <p><b>volumeid:</b> If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume.</p> <p><b>vserver:</b> If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the Vserver that owns this volume.</p>

**sfcli SnapMirror quiescerelationship <options>**

Description	Options
<p>This command disables future data transfers for a SnapMirror relationship. If a transfer is in progress, the relationship status becomes <code>quiescing</code> until the transfer is complete. If the current transfer is aborted, it will not restart. You can reenable data transfers for the relationship using the <code>SnapMirror ResumeRelationship</code> command.</p>	<p><code>snapmirrorendpointid</code>: Specifies the endpoint ID of the remote ONTAP storage system communicating with the Element storage cluster. This option is required.</p> <p><code>snapmirrorvolumeinfo</code>: If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume. If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the SVM that owns the volume.</p> <p><code>snapmirrorvolumeinfo</code> name: Specifies the name of the volume.</p> <p><code>snapmirrorvolumeinfo</code> type: Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>solidfire</code>: The volume resides on a SolidFire cluster.</li> <li>• <code>ontap</code>: The volume resides on a remote ONTAP cluster.</li> </ul> <p><code>volumeid</code>: If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume.</p> <p><code>vserver</code>: If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the Vserver that owns this volume.</p>

**sfcli SnapMirror resumerelationship <options>**

Description	Options
<p>This command enables future transfers for a quiesced SnapMirror relationship.</p>	<p>snapmirrorendpointid: Specifies the endpoint ID of the remote ONTAP storage system communicating with the SolidFire storage cluster. This option is required.</p> <p>snapmirrorvolumeinfo: If the snapmirrorvolumeinfo type is solidfire, this specifies the ID of the volume. If the snapmirrorvolumeinfo type is ontap, this specifies the name of the SVM that owns the volume.</p> <p>snapmirrorvolumeinfo name: Specifies the name of the volume.</p> <p>snapmirrorvolumeinfo type: Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• solidfire: The volume resides on a SolidFire cluster.</li> <li>• ontap: The volume resides on a remote ONTAP cluster.</li> </ul> <p>volumeid: If the snapmirrorvolumeinfo type is solidfire, this specifies the ID of the volume.</p> <p>vserver: If the snapmirrorvolumeinfo type is ontap, this specifies the name of the Vserver that owns this volume.</p>

**sfcli SnapMirror resyncrelationship <options>**

Description	Options
<p>This command establishes or reestablishes a mirror relationship between a source and destination endpoint. When you resynchronize a relationship, the system removes Snapshot copies on the destination volume that are newer than the common Snapshot copy, and then mounts the destination volume as a data protection volume with the common Snapshot copy as the exported Snapshot copy.</p>	<p><b>maxtransferrate:</b> Specifies the maximum data transfer rate between the volumes in kilobytes per second. The default value, 0, is unlimited and permits the SnapMirror relationship to fully utilize the available network bandwidth.</p> <p><b>snapmirrorendpointid:</b> Specifies the endpoint ID of the remote ONTAP storage system communicating with the Element storage cluster. This option is required.</p> <p><b>snapmirrorvolumeinfo:</b> If the <b>snapmirrorvolumeinfotype</b> is <b>solidfire</b>, this specifies the ID of the volume. If the <b>snapmirrorvolumeinfotype</b> is <b>ontap</b>, this specifies the name of the SVM that owns the volume.</p> <p><b>snapmirrorvolumeinfo<sub>namedestination</sub>volume:</b> Specifies the name of the volume.</p> <p><b>snapmirrorvolumeinfotype<sub>destination</sub>volume:</b> Specifies the type of volume. Possible values are:</p> <ul style="list-style-type: none"> <li>• <b>solidfire:</b> The volume resides on a SolidFire cluster.</li> <li>• <b>ontap:</b> The volume resides on a remote ONTAP cluster.</li> </ul> <p><b>snapmirrorvolumeinfo<sub>namesource</sub>volume:</b> Specifies the name of the volume.</p> <p><b>snapmirrorvolumeinfotype<sub>source</sub>volume:</b> Specifies the type of volume. Possible values are:</p> <ul style="list-style-type: none"> <li>• <b>solidfire:</b> The volume resides on a SolidFire cluster.</li> <li>• <b>ontap:</b> The volume resides on a remote ONTAP cluster.</li> </ul> <p><b>snapmirrorvolumeinfo<sub>volumeid</sub>sourcevolume:</b> Specifies the ID of the volume. Only valid if <b>snapmirrorvolumeinfotype<sub>destination</sub>volume</b> is <b>solidfire</b>.</p> <p><b>snapmirrorvolumeinfo<sub>vserver</sub>sourcevolume:</b> Specifies the name of the VServer that owns this volume. Only valid if <b>snapmirrorvolumeinfotype<sub>destination</sub>volume</b> is <b>ontap</b>.</p> <p><b>volumeid<sub>destination</sub>volume:</b> Specifies the ID of the volume. Only valid if <b>snapmirrorvolumeinfotype<sub>destination</sub>volume</b> is <b>solidfire</b>.</p> <p><b>vserver<sub>destination</sub>volume:</b> Specifies the name of the VServer that owns this volume. Only valid if</p>

**sfcli SnapMirror updaterelationship <options>**

Description	Options
<p>This command makes the destination volume in a SnapMirror relationship an up-to-date mirror of the source volume.</p>	<p><b>maxtransferrate:</b> Specifies the maximum data transfer rate between the volumes in kilobytes per second. The default value, 0, is unlimited and permits the SnapMirror relationship to fully utilize the available network bandwidth.</p> <p><b>snapmirrorendpointid:</b> Specifies the endpoint ID of the remote ONTAP storage system communicating with the SolidFire storage cluster. This option is required.</p> <p><b>snapmirrorvolumeinfo:</b> If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume. If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the SVM that owns the volume.</p> <p><b>snapmirrorvolumeinfo</b>name: Specifies the name of the volume.</p> <p><b>snapmirrorvolumeinfo</b>type: Specifies the type of volume. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>solidfire</code>: The volume resides on a SolidFire cluster.</li> <li>• <code>ontap</code>: The volume resides on a remote ONTAP cluster.</li> </ul> <p><b>volumeid:</b> If the <code>snapmirrorvolumeinfo</code> type is <code>solidfire</code>, this specifies the ID of the volume.</p> <p><b>vserver:</b> If the <code>snapmirrorvolumeinfo</code> type is <code>ontap</code>, this specifies the name of the Vserver that owns this volume.</p>

## Snapshot commands

You can use the commands in this section to perform operations, such as create a point-in-time copy (snapshot) of a volume, change the attributes assigned to a snapshot, and so on.

### sfcli Snapshot create <options>

Description	Options
<p>This command enables you to create a point-in-time copy of a volume. You can create a snapshot from any volume or from an existing snapshot. If you do not provide a SnapshotID, a snapshot is created from the volume's active branch. If the volume from which the snapshot is created is being replicated to a remote cluster, the snapshot can also be replicated to the same target. Use the enableRemoteReplication option to enable snapshot replication.</p> <p><b>Note:</b> Creating a snapshot is allowed if cluster fullness is at stage 2 or 3. Snapshots are not created when cluster fullness is at stage 4 or 5.</p>	<p>attributes: List of name-value pairs in JSON object format.</p> <p>enableremotereplication: Replicates the snapshot created to a remote cluster. Possible values are:</p> <ul style="list-style-type: none"> <li>• true: The snapshot is replicated to remote storage.</li> <li>• false: Default; the snapshot is not replicated.</li> </ul> <p>name: Specifies a name for the snapshot. If unspecified, the date and time the snapshot was taken is used.</p> <p>retention: Specifies the amount of time for which the snapshot is retained. The format is HH:mm:ss.</p> <p>snapmirrorlabel: Specifies the label used by SnapMirror software to specify snapshot retention policy on SnapMirror endpoint.</p> <p>snapshotid: Specifies the unique ID of a snapshot from which the new snapshot is made. The snapshotID passed must be a snapshot on the given volume.</p> <p>volumeid: Specifies the unique ID of the volume image from which to copy.</p>



**sfcli Snapshot creategroup <options>**

Description	Options
<p>This command enables you to create a point-in-time copy of a group of volumes. You can use this snapshot later as a backup or rollback to ensure the data on the group of volumes is consistent for the point in time that you created the snapshot.</p> <p><b>Note:</b> Creating a group snapshot is allowed if cluster fullness is at stage 2 or 3. Snapshots are not created when cluster fullness is at stage 4 or 5.</p>	<p><b>attributes:</b> List of name-value pairs in JSON object format.</p> <p><b>enableremotereplication:</b> Replicates the snapshot created to remote storage. Possible values are:</p> <ul style="list-style-type: none"> <li>• true: The snapshot is replicated to remote storage.</li> <li>• false: Default; the snapshot is not replicated.</li> </ul> <p><b>name:</b> Name for the group snapshot. If no name is given, then the date and time the group snapshot was taken is used.</p> <p><b>retention:</b> Specifies the amount of time for which the snapshots are retained. The format is HH:mm:ss.</p> <p><b>snapmirrorlabel:</b> Specifies the label used by SnapMirror software to specify snapshot retention policy on SnapMirror endpoint.</p> <p><b>volumes:</b> Unique ID of the volume image from which to copy.</p>

**sfcli Snapshot createschedule <options>**

Description	Options
<p>This command enables you to schedule an automatic snapshot of a volume at a defined interval. You can use the created snapshot later as a backup or rollback to ensure the data on a volume or group of volumes is consistent for the point in time in which the snapshot was created. If you schedule a snapshot to run at a time period that is not divisible by 5 minutes, the snapshot runs at the next time period that is divisible by 5 minutes. For example, if you schedule a snapshot to run at 12:42:00 UTC, it runs at 12:45:00 UTC.</p> <p><b>Note:</b> You can create snapshots if cluster fullness is at stage 1, 2, or 3. You cannot create snapshots after cluster fullness reaches stage 4 or 5.</p>	<p><b>days:</b> Indicates the number of days between each snapshot.</p> <p><b>haserror:</b> Indicates if the schedule has errors or not.</p> <p><b>hours:</b> If provided with minutes and days, indicates how much time is in between each snapshot. If provided with weekdays or monthdays, indicates the time at which a snapshot will occur.</p> <p><b>lastrunstatus:</b> Indicates the status of the last scheduled snapshot. Valid values are "success" or "failed."</p> <p><b>lastruntimestarted:</b> Indicates the last time the schedule started in ISO 8601 date string. Valid values are "success" or "failed."</p> <p><b>minutes:</b> If provided with hours and days, indicates how much time is in between each snapshot. If provided with weekdays or monthdays, indicates the time at which a snapshot will occur. If unspecified, defaults to 0.</p> <p><b>monthdays:</b> Indicates the days of the month on which snapshots occur.</p> <p><b>name:</b> Specifies the unique name assigned to the schedule. This option is required.</p> <p><b>paused:</b> Indicates if the schedule is paused or not.</p> <p><b>recurring:</b> Indicates if the schedule is recurring or not.</p> <p><b>runnextinterval:</b> Indicates whether or not the schedule will run the next time the scheduler is active. When set to "true", the schedule will run the next time the schedule is active, and then reset back to "false."</p> <p><b>scheduleid:</b> Unique ID of the schedule.</p> <p><b>startingdate:</b> Indicates the date on which your schedule runs for the first time. It is formatted in UTC time.</p> <p><b>tobedeleted:</b> Indicates if the schedule is marked for deletion.</p> <p><b>weekdays:</b> Indicates the weekday on which the snapshot will occur.</p>

**sfcli Snapshot delete** <options>

Description	Options
This command enables you to delete a snapshot. A snapshot that is currently the "active" snapshot cannot be deleted. You must rollback and make another snapshot "active" before the current snapshot can be deleted.	snapshotid: The ID of the snapshot to be deleted.

**sfcli Snapshot deletegroup** <options>

Description	Options
This command enables you to delete a group snapshot. You can use the <code>saveMembers</code> option to preserve all the snapshots that were made for the volumes in the group, but the group association is removed.	groupsnapshotid: Specifies the unique ID of the group snapshot. savemembers: Specifies whether to preserve snapshots or delete them. Valid values are: <ul style="list-style-type: none"> <li>• true: Snapshots are preserved, but group association is removed.</li> <li>• false: The group and snapshots are deleted.</li> </ul>

**sfcli Snapshot list** <options>

Description	Options
This command enables you to return the attributes of each snapshot taken on the volume.	snapshotid: Retrieves information for a specific snapshot ID. volumeid: Retrieves snapshots for a volume. If volumeID is not provided, all snapshots for all volumes are returned.

**sfcli Snapshot listgroup** <options>

Description	Options
This command enables you to get information about all group snapshots that have been created.	groupsnapshotid: Retrieves information for a specific group snapshot ID. volumeid: An array of unique volume IDs to query. If you do not specify this, all group snapshots on the cluster are included.

**sfcli Snapshot modify <options>**

Description	Options
<p>This command enables you to change the attributes currently assigned to a snapshot. You can use it to enable snapshots created on the Read/Write (source) volume to be remotely replicated to a target SolidFire storage system.</p>	<p>enableremotereplication: Replicates the snapshot created to a remote cluster. Possible values are:</p> <ul style="list-style-type: none"> <li>• true: The snapshot is replicated to remote storage.</li> <li>• false: Default; the snapshot is not replicated.</li> </ul> <p>expirationtime: Sets the time when the snapshot should be removed.</p> <p>snapshotid: Specifies the ID of the snapshot.</p> <p>snapmirrorlabel: Specifies the label used by SnapMirror software to specify snapshot retention policy on SnapMirror endpoint.</p>

**sfcli Snapshot modifygroup <options>**

Description	Options
<p>This command enables you to change the attributes of a group of snapshots. You can also use it to enable snapshots created on the Read/Write (source) volume to be remotely replicated to a target SolidFire storage system.</p>	<p>enableremotereplication: Replicates the snapshot created to a remote cluster. Possible values are:</p> <ul style="list-style-type: none"> <li>• true: The snapshot is replicated to remote storage.</li> <li>• false: Default; the snapshot is not replicated.</li> </ul> <p>expirationtime: Sets the time when the snapshot should be removed. If unspecified, the current time is used.</p> <p>groupsnapshotid: Specifies the ID of the group of snapshots.</p> <p>snapmirrorlabel: Specifies the label used by SnapMirror software to specify snapshot retention policy on SnapMirror endpoint.</p>

**sfcli Snapshot modifyschedule <options>**

Description	Options
<p>This command enables you to change the intervals at which a scheduled snapshot occurs. This allows for adjustment to the snapshot frequency and retention.</p>	<p><b>days:</b> Indicates the number of days between each snapshot.</p> <p><b>haserror:</b> Indicates if the schedule has errors or not.</p> <p><b>hours:</b> If provided with minutes and days, indicates how much time is in between each snapshot. If provided with weekdays or monthdays, indicates the time at which a snapshot will occur.</p> <p><b>lastrunstatus:</b> Indicates the status of the last scheduled snapshot. Valid values are: success or failed.</p> <p><b>lastruntimestarted:</b> Indicates the last time the schedule started as an ISO 8601 date string. Valid values are: success or failed.</p> <p><b>minutes:</b> If provided with hours and days, indicates how much time is in between each snapshot. If provided with weekdays or monthdays, indicates the time at which a snapshot will occur. If unspecified, defaults to 0.</p> <p><b>monthdays:</b> Indicates the days of the month on which snapshots occur.</p> <p><b>name:</b> Specifies the unique name assigned to the schedule. This option is required.</p> <p><b>paused:</b> Indicates if the schedule is paused or not.</p> <p><b>recurring:</b> Indicates if the schedule is recurring or not.</p> <p><b>runnextinterval:</b> Indicates whether or not the schedule will run the next time the scheduler is active. When set to "true", the schedule will run the next time the schedule is active, and then reset back to "false."</p> <p><b>scheduleid:</b> Specifies the unique ID of the schedule.</p> <p><b>startingdate:</b> Indicates the date on which your schedule runs for the first time. It is formatted in UTC time.</p> <p><b>tobedeleted:</b> Indicates if the schedule is marked for deletion.</p> <p><b>weekdays:</b> Indicates the weekday on which the snapshot will occur.</p>

**sfcli Snapshot rollbackto <options>**

Description	Options
<p>This command enables you to make an existing snapshot of the "active" volume image. This command creates a new snapshot from an existing snapshot. The new snapshot becomes "active" and the existing snapshot is preserved until you delete it. The previously "active" snapshot is deleted unless you set the <code>saveCurrentState</code> option to true.</p> <p><b>Note:</b> Creating a snapshot is allowed if cluster fullness is at stage 2 or 3. Snapshots are not created when cluster fullness is at stage 4 or 5.</p>	<p><code>attributes</code>: List of name-value pairs in JSON object format.</p> <p><code>name</code>: Name for the snapshot. If no name is given, then the name of the snapshot being rolled back to is used with "-copy" appended to the end of the name.</p> <p><code>savecurrentstate</code>: Specifies whether to save an active volume image or delete it. Valid values are:</p> <ul style="list-style-type: none"> <li><code>true</code>: The previous active volume image is kept.</li> <li><code>false</code>: Default; the previous active volume image is deleted.</li> </ul> <p><code>snapshotid</code>: ID of a previously created snapshot on the given volume.</p> <p><code>volumeid</code>: VolumeID for the volume.</p>

**sfcli Snapshot rollbacktogroup <options>**

Description	Options
<p>This command enables you to roll back all individual volumes in a snapshot group to each volume's individual snapshot.</p> <p><b>Note:</b> Rolling back to a group snapshot creates a temporary snapshot of each volume within the group snapshot. Snapshots are allowed if cluster fullness is at stage 2 or 3. Snapshots are not created when cluster fullness is at stage 4 or 5.</p>	<p><code>attributes</code>: List of name-value pairs in JSON object format.</p> <p><code>groupsnapshotid</code>: Specifies the unique ID of the group snapshot.</p> <p><code>name</code>: Name for the group snapshot of the volume's current state that is created if <code>saveCurrentState</code> is set to true. If you do not give a name, the name of the snapshots (group and individual volume) are set to a timestamp of the time that the rollback occurred.</p> <p><code>savecurrentstate</code>: Specifies whether to save an active volume image or delete it. Valid values are: <code>true</code> (the previous active volume image is kept) or <code>false</code> (default; the previous active volume image is deleted).</p>

## snmp commands

Use the commands in this section to perform Simple Network Management Protocol (SNMP) operations.

### sfcli Snmp enable <options>

Description	Options
This command enables you to enable SNMP on cluster nodes. When you enable SNMP, the action applies to all nodes in the cluster, and the values that are passed replace, in whole, all values set in any previous command.	snmpv3enabled: If set to true, then SNMP v3 is enabled on each node in the cluster. If set to false, then SNMP v2 is enabled.

### sfcli Snmp disable <options>

Description	Options
This command enables you to disable SNMP on the cluster nodes.	None

### sfcli Snmp getacl <options>

Description	Options
This command enables you to return the current SNMP access permissions on the cluster nodes.	None

### sfcli Snmp getinfo <options>

Description	Options
This command enables you to retrieve the current simple network management protocol (SNMP) configuration information. Note: GetSnmpInfo is available for Element OS 8 and prior releases. It is deprecated for versions later than Element OS 8. NetApp recommends that you migrate to the GetSnmpState and SetSnmpACL methods. See details in the Element API Reference Guide for their descriptions and usage.	None

### sfcli Snmp gettrapinfo <options>

Description	Options
This command enables you to retrieve the current SNMP trap configuration information.	None

### sfcli Snmp getstate <options>

Description	Options
This command enables you to retrieve the current state of the SNMP feature.	None

### sfcli Snmp sendtesttraps <options>

Description	Options
This command enables you to test SNMP functionality for a cluster. This command instructs the cluster to send test SNMP traps to the currently configured SNMP manager.	None

**sfcli Snmp setacl <options>**

Description	Options
<p>This command enables you to configure SNMP access permissions on the cluster nodes. The values you set with this interface apply to all nodes in the cluster, and the values that are passed replace, in whole, all values set in any previous command.</p> <p><b>Note:</b> the values set with this interface replace all <code>network</code> or <code>usmUsers</code> values set with the older <code>SetSnmpInfo</code> command.</p>	<p><code>accessnetworks</code>: Possible values include:</p> <ul style="list-style-type: none"> <li>• <code>ro</code>: read-only access.</li> <li>• <code>rw</code>: for read-write access.</li> <li>• <code>rosys</code>: for read-only access to a restricted set of system information.</li> </ul> <p>Recommendation: Set all networks other than the default <code>localhost</code> to <code>ro</code> access because all MIB objects are read-only.</p> <p><code>accessusmusers</code>: Possible values include:</p> <ul style="list-style-type: none"> <li>• <code>rouser</code>: read-only access.</li> <li>• <code>rwuser</code>: for read-write access.</li> <li>• <code>rosys</code>: for read-only access to a restricted set of system information.</li> </ul> <p>Recommendation: Set all USM users to <code>rouser</code> access because all MIB objects are read-only.</p> <p><code>cidr</code>: Specifies a CIDR network mask. This network mask must be an integer greater than or equal to 0, and less than or equal to 32. It must also not be equal to 31.</p> <p><code>community</code>: Specifies a SNMP community string.</p> <p><code>name</code>: Specifies the name of the user. Must contain at least one character, but no more than 32 characters. Blank spaces are not allowed.</p> <p><code>network</code>: Specifies the parameter integer with the <code>cidr</code> variable is used to control which network the access and community string apply to. The special value of default is used to specify an entry that applies to all networks. The <code>cidr</code> mask is ignored when <code>network</code> value is either a host name or default.</p> <p><code>networks</code>: Specifies the list of networks and what type of access they have to the SNMP servers running on the cluster nodes. This parameter is required if SNMP v3 is disabled.</p> <p><code>passphrase</code>: Specifies the passphrase of the user. Must be between 8 and 255 characters integer (inclusive). Blank spaces are not allowed. Required if <code>secLevel</code> is <code>auth</code> or <code>priv</code>.</p> <p><code>password</code>: Specifies the password of the user. Must be between 8 and 255 characters integer (inclusive). Blank spaces are not allowed. Required if <code>secLevel</code> is <code>auth</code> or <code>priv</code>.</p>



Description continued	Options continued
	<p><code>seclvl</code>: Possible values include:</p> <ul style="list-style-type: none"> <li><code>auth</code>: A password is required for user access.</li> <li><code>noauth</code>: No password or passphrase is required.</li> <li><code>priv</code>: A password and passphrase is required for user access.</li> </ul> <p><code>usmusers</code>: Specifies the list of users and the type of access they have to the SNMP servers running on the cluster nodes.</p>

**sfcli Snmp setinfo <options>**

Description	Options
<p>This command enables you to configure SNMP version 2 and version 3 on cluster nodes. The values you set with this interface apply to all nodes in the cluster, and the values that are passed replace, in whole, all values set in any previous call to <code>SetSnmpInfo</code>.</p> <p><b>Note:</b> <code>SetSnmpInfo</code> is deprecated. Use the <code>EnableSnmp</code> and <code>SetSnmpACL</code> methods instead.</p>	<p><code>enabled</code>: If set to true, SNMP is enabled on each node in the cluster.</p> <p><code>networks</code>: List of networks and what type of access they have to the SNMP servers running on the cluster nodes. See the <code>SNMP Network Object</code> for possible <code>networks</code> values. This parameter is required only for SNMP v2.</p> <p><code>snmpv3enabled</code>: If set to true, SNMP v3 is enabled on each node in the cluster.</p> <p><code>usmusers</code>: If SNMP v3 is enabled, this value must be passed in place of the <code>networks</code> parameter. This parameter is required only for SNMP v3.</p>

**sfcli Snmp settrapinfo <options>**

Description	Options
<p>This command enables and disables the generation of cluster SNMP notifications (traps) and to specify the set of network host computers that receive the notifications. The values you pass with each SetSnmpTrapInfo command replace all values set in any previous command.</p>	<p>clustereventtrapsenabled: If the value is set to true, a corresponding solidFireClusterEventNotification is sent to the configured list of trap recipients when a cluster event is logged. The default value is false.</p> <p>clusterfaultresolvedtrapsenabled: If the value is set to true, a corresponding solidFireClusterFaultResolvedNotification is sent to the configured list of trap recipients when a cluster fault is resolved. The default value is false.</p> <p>clusterfaulttrapsenabled: If the value is set to true, a corresponding solidFireClusterFaultResolvedNotification is sent to the configured list of trap recipients when a cluster fault is resolved. The default value is false.</p> <p>traprecipients: List of hosts that are to receive the traps generated by the Cluster Master. At least one object is required if any one of the trap types is enabled.</p>

## SSH commands

Use the commands in this section to perform SSH operations.

**sfcli SSH disablessh <options>**

Description	Options
<p>This command disables the SSH service for a single node in the storage cluster. This command does not affect the cluster-wide SSH service timeout duration.</p>	<p>duration: The amount of time that the SSH service will remain disabled. This option is required.</p>

**sfcli SSH disableclusterssh <options>**

Description	Options
<p>This command disables the SSH service for the entire storage cluster. When you add nodes to the storage cluster, the new nodes will inherit this cluster-wide setting.</p>	<p>duration: The amount of time that the SSH service will remain disabled. This option is required.</p>

**sfcli SSH enablessh <options>**

Description	Options
<p>This command enables the SSH service on a single node in the storage cluster. This command does not affect the cluster-wide SSH timeout duration and does not exempt the node from having SSH disabled by a global SSH timeout.</p>	<p>duration: The amount of time that the SSH service will remain enabled. This option is required.</p>

**sfcli SSH enableclusterssh <options>**

Description	Options
This command enables the SSH service on all nodes in the storage cluster.	<code>duration</code> : The amount of time that the SSH service will remain enabled. This option is required.

**sfcli SSH getsshinfo <options>**

Description	Options
This command queries the status of the SSH service for the targeted node.	None

**sfcli SSH getclustersshinfo <options>**

Description	Options
This command queries the status of the SSH service for the entire storage cluster.	None

## Storage container commands

Storage containers are logical constructs that map to SolidFire accounts. You can use storage containers for reporting and resource allocation. This section includes the commands that you can use in CLI Tools to perform operations on virtual volume storage containers.

**sfcli StorageContainer create <options>**

Description	Options
This command enables you to create a Virtual Volume (VVol) storage container. Storage containers can only be associated with virtual volumes. You need at least one storage container to use the Virtual Volumes feature.	<code>accountid</code> : Non-storage container account that will become a storage container. <code>initiatorsecret</code> : The secret for CHAP authentication for the initiator. <code>name</code> : The name of the storage container. Follows SolidFire account naming restrictions. <code>targetsecret</code> : The secret for CHAP authentication for the target.

**sfcli StorageContainer delete <options>**

Description	Options
This command enables you to remove up to 2000 Virtual Volume (VVol) storage containers from the system at one time. The storage containers you remove must not contain any VVols.	<code>storagecontainerids</code> : A list of IDs of the storage containers to delete. You can specify up to 2000 IDs in the list.

**sfcli StorageContainer getefficiency <options>**

Description	Options
This command enables you to retrieve efficiency information about a virtual volume storage container.	<code>storagecontainerid</code> : The ID of the storage container for which to retrieve efficiency information.

**sfcli StorageContainer list <options>**

Description	Options
This command enables you to retrieve information about all virtual volume storage containers known to the system.	storagecontainerids: A list of storage container IDs for which to retrieve information. If you omit this option, the command returns information about all storage containers in the system.

**sfcli StorageContainer modify <options>**

Description	Options
This command enables you to make changes to an existing virtual volume storage container.	initiatorsecret: The new secret for CHAP authentication for the initiator. storagecontainerid: The unique ID of the virtual volume storage container to modify. targetsecret: The new secret for CHAP authentication for the target.

**Test commands**

This section describes the test commands that you can use in CLI Tools.

**sfcli Test connectensemble <options>**

Description	Options
The command enables you to verify connectivity with a specified database ensemble. By default, it uses the ensemble for the cluster that the node is associated with. Alternatively, you can provide a different ensemble to test connectivity with.	ensemble: Uses a comma-separated list of ensemble node cluster IP addresses to test connectivity. This parameter is optional.

**sfcli Test connectmvip <options>**

Description	Options
This command enables you to test the management connection to the cluster. The test pings the MVIP and executes a simple API method to verify connectivity.	mvip: If specified, tests the management connection of a different MVIP. You do not need to use this value when testing the connection to the target cluster. This parameter is optional.

**sfcli Test connectsvip <options>**

Description	Options
The command enables you to test the storage connection to the cluster. The test pings the SVIP using ICMP packets, and when successful, connects as an iSCSI initiator.	svip : If specified, tests the storage connection of a different SVIP. You do not need to use this value when testing the connection to the target cluster. This parameter is optional.

**sfcli Test hardwareconfig <options>**

Description	Options
You can use this command to check the hardware configuration.	None

**sfcli Test list** <options>

Description	Options
You can use this command to return the tests that are available to run on a node.	None

**sfcli Test listutilities** <options>

Description	Options
You can use this command to return the operations that are available to run on a node.	None

**sfcli Test localconnectivity** <options>

Description	Options
You can use this command to test the local network connectivity.	None

**sfcli Test locatecluster** <options>

Description	Options
You can use this command to find the cluster.	None

**sfcli Test networkconfig** <options>

Description	Options
You can use this command to test the network configuration.	None

**sfcli Test ping <options>**

Description	Options
<p>You can use this command to validate the connection to all the nodes in a cluster on both 1G and 10G interfaces by using ICMP packets. The test uses the appropriate MTU sizes for each packet based on the MTU settings in the network configuration.</p>	<p><b>attempts:</b> Specifies the number of times the system should repeat the test ping. The default value is 5.</p> <p><b>hosts:</b> Specifies a comma-separated list of addresses or hostnames of devices to ping.</p> <p><b>interface:</b> Specifies an existing interface on which the temporary VLAN interface is created.</p> <p><b>packetsize:</b> Specifies the number of bytes to send in the ICMP packet that is sent to each IP. The number must be less than the maximum MTU specified in the network configuration.</p> <p><b>pingtimeoutmsec:</b> Specifies the number of milliseconds to wait for each individual ping response. The default value is 500 ms.</p> <p><b>prohibitfragmentation:</b> Specifies that the Do not Fragment (DF) flag is enabled for the ICMP packets.</p> <p><b>sourceAddressV4:</b> Specifies the IPv4 source address to be used in the ICMP ping packets. You must specify either a sourceAddressV4 or a sourceAddressV6.</p> <p><b>sourceAddressV6:</b> Specifies the IPv6 source address to be used in the ICMP ping packets. You must specify either a sourceAddressV4 or a sourceAddressV6.</p> <p><b>totaltimeoutsec:</b> Specifies the length of time the ping should wait for a system response before issuing the next ping attempt or ending the process.</p> <p><b>virtualNetworkTag:</b> Specifies the VLAN on which host addresses reachability needs to be tested. The temporary VLAN interface is created with this tag.</p>

**sfcli Test remoteconnectivity <options>**

Description	Options
<p>You can use this command to test remote connectivity.</p>	<p>None</p>

**Virtual network commands**

Virtual networking in SolidFire storage enables traffic between multiple clients that are on separate logical networks to be connected to one cluster. You can use the commands in this section

to add a new virtual network to a cluster, changes the attributes of an existing virtual network, remove a virtual network you added, and so on.


**sfcli VirtualNetwork add <options>**

Description	Options
<p>This command enables you to add a new virtual network to a cluster configuration. When you add a virtual network, an interface for each node is created and each interface will require a virtual network IP address. The number of IP addresses you specify must be equal to or greater than the number of nodes in the cluster. The system bulk provisions virtual network addresses and assigns them to individual nodes automatically. You do not need to assign virtual network addresses to nodes manually.</p> <p><b>Note:</b> To make changes to an existing virtual network, use the <code>sfcli VirtualNetwork modify options</code> command.</p>	<p>addressblocks: Unique range of IP addresses to include in the virtual network. Attributes for this option are:</p> <ul style="list-style-type: none"> <li>start: The start of the IP address range. (String)</li> <li>size: The number of IP addresses to include in the block. (Integer)</li> </ul> <p>attributes: List of name-value pairs in JSON object format.</p> <p>available: Number of available blocks.</p> <p>gateway: The IP address of a gateway of the virtual network. This option is only valid if the namespace option is set to true.</p> <p>name: Name for the new virtual network.</p> <p>namespace: When set to true, enables the Routable Storage VLANs functionality by creating and configuring a namespace and the virtual network contained by it.</p> <p>netmask: Unique network mask for the virtual network being created.</p> <p>size: Number of IP addresses to include in the block.</p> <p>start: Start of the IP address range.</p> <p>svip: Unique storage IP address for the virtual network being created.</p> <p>virtualnetworktag: A unique virtual network (VLAN) tag. Supported values are 1 through 4094. The number zero (0) is not supported.</p>

**sfcli VirtualNetwork list <options>**

Description	Options
<p>This command enables you to list all configured virtual networks for the cluster. You can use this to verify the virtual network settings in the cluster. There are no required options. However, to filter the results, you can pass one or more <code>virtualnetworkid</code> or <code>virtualnetworktag</code> values.</p>	<p>virtualnetworkid: Network ID to filter the list for a single virtual network.</p> <p>virtualnetworkids: Network IDs to include in the list.</p> <p>virtualnetworktag: Network tag to filter the list for a single virtual network.</p> <p>virtualnetworktags: Network tag to include in the list.</p>

**sfcli VirtualNetwork modify <options>**

Description	Options
<p>This command enables you to change the attributes of an existing virtual network. It enables you to add or remove address blocks, change the netmask, or modify the name or description of the virtual network. You can also use it to enable or disable namespaces, as well as add or remove a gateway if namespaces are enabled on the virtual network.</p> <p><b>Note:</b> You must specify either the <code>virtualnetworkid</code> or the <code>virtualnetworktag</code> option, but not both.</p> <p> <b>CAUTION:</b> Enabling or disabling the Routable Storage VLANs functionality for an existing virtual network by changing the <code>namespace</code> option disrupts any traffic handled by the virtual network. NetApp strongly recommends changing the <code>namespace</code> option only during a scheduled maintenance window.</p>	<p><code>addressblocks</code>: The new addressBlock to set for this virtual network. This might contain new address blocks to add to the existing object or omit unused address blocks that need to be removed. Alternatively, you can extend or reduce the size of existing address blocks. You can only increase the size of the starting addressBlocks for a virtual network object; you can never decrease it. Attributes for this option are:</p> <ul style="list-style-type: none"> <li><code>start</code>: The start of the IP address range. (String)</li> <li><code>size</code>: The number of IP addresses to include in the block. (Integer)</li> </ul> <p><code>attributes</code>: List of name-value pairs in JSON object format.</p> <p><code>gateway</code>: The IP address of a gateway of the virtual network. This option is only valid if the <code>namespace</code> option is set to true.</p> <p><code>name</code>: Name for the new virtual network.</p> <p><code>namespace</code>: When set to true, enables Routable Storage VLANs functionality by recreating the virtual network and configuring a namespace to contain it. When set to false, disables the VRF functionality for the virtual network. Changing this value disrupts traffic running through this virtual network.</p> <p><code>netmask</code>: New network mask for the virtual network.</p> <p><code>svip</code>: The storage virtual IP address for this virtual network. The <code>svip</code> for a virtual network cannot be changed. You must create a new virtual network to use a different <code>svip</code> address.</p> <p><code>virtualnetworkid</code>: The unique identifier of the virtual network to modify. This is the virtual network ID assigned by the cluster.</p> <p><code>virtualnetworktag</code>: The network tag that identifies the virtual network to modify.</p>

**sfcli VirtualNetwork remove <options>**

Description	Options
<p>This command enables you to remove a previously added virtual network.</p> <p><b>Note:</b> You must specify either the <code>virtualnetworkid</code> or the <code>virtualnetworktag</code> option, but not both.</p>	<p><code>virtualnetworkid</code>: Network ID that identifies the virtual network to remove.</p> <p><code>virtualnetworktag</code>: Network tag that identifies the virtual network to remove.</p>



## Virtual volume commands

This section lists the commands that enable you to perform operations on the virtual volumes, such as listing virtual volume tasks, hosts, and so on.

### sfcli VirtualVolume enablefeature <options>

Description	Options
<p>This command enables you to enable cluster features that are disabled by default.</p>	<p>feature: Specifies which feature to enable. Valid values are:</p> <ul style="list-style-type: none"> <li>• v vols: Enable the NetApp SolidFire VVols cluster feature.</li> <li>• FipsDrives: Enable the NetApp SolidFire cluster FIPS 140-2 drive support.</li> <li>• Fips: Enable FIPS 140-2 certified encryption for HTTPS communications.</li> <li>• SnapMirror: Enable the SnapMirror replication cluster feature.</li> </ul>

### sfcli VirtualVolume getfeaturestatus <options>

Description	Options
<p>This command enables you to retrieve the status of a cluster feature.</p>	<p>feature: Specifies the feature for which the status is returned. Valid values are:</p> <ul style="list-style-type: none"> <li>• v vols: Retrieve status for the NetApp SolidFire VVols cluster feature.</li> <li>• FipsDrives: Retrieve status for the FIPS 140-2 drive encryption feature.</li> <li>• Fips: Retrieve status for the FIPS 140-2 encryption for HTTPS communication feature.</li> <li>• SnapMirror: Retrieve status for the SnapMirror replication cluster feature.</li> </ul>

### sfcli VirtualVolume getcount <options>

Description	Options
<p>This command enables you to retrieve the number of virtual volumes currently in the system.</p>	<p>None</p>

**sfcli VirtualVolume list <options>**

Description	Options
<p>This command enables you to list the virtual volumes currently in the system. You can use this to list all virtual volumes or a subset of the virtual volumes in the system.</p>	<p><code>details</code>: Specifies the level of detail about each virtual volume that is returned. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>true</code>: Include more details about each virtual volume in the response.</li> <li>• <code>false</code>: Include the standard level of detail about each virtual volume in the response.</li> </ul> <p><code>limit</code>: The maximum number of virtual volumes to list.</p> <p><code>recursive</code>: Specifies whether to include information about the children of each virtual volume in the response. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>true</code>: Include information about the children of each virtual volume in the response.</li> <li>• <code>false</code>: Do not include information about the children of each virtual volume in the response.</li> </ul> <p><code>startvirtualvolumeid</code>: The ID of the virtual volume at which to begin the list.</p> <p><code>virtualvolumeids</code>: A list of virtual volume IDs for which to retrieve information. If you specify this, the command returns information about only these virtual volumes.</p>

**sfcli VirtualVolume listbindings <options>**

Description	Options
<p>This command returns a list of all virtual volumes in the cluster that are bound to protocol endpoints.</p>	<p><code>virtualvolumebindingids</code>: A list of virtual volume binding IDs for which to retrieve information. If unspecified, you get information about all virtual volume bindings.</p>

**sfcli VirtualVolume listhosts <options>**

Description	Options
<p>This command returns a list of all virtual volume hosts known to the cluster. A virtual volume host is a VMware ESX host that has initiated a session with the VASA API provider.</p>	<p><code>virtualvolumehostids</code>: A list of virtual volume host IDs for which to retrieve information. If unspecified, you get information about all virtual volume hosts.</p>

**sfcli VirtualVolume listprotocolendpoints <options>**

Description	Options
This command enables you to retrieve information about all protocol endpoints in the cluster. Protocol endpoints govern access to their associated virtual volume storage containers.	<b>protocolendpointids:</b> Specifies a list of protocol endpoint IDs for which to retrieve information. If you omit this parameter, the method returns information about all protocol endpoints.

**sfcli VirtualVolume listtasks <options>**

Description	Options
This command returns a list of virtual volume tasks in the system.	<b>virtualvolumetaskids:</b> A list of virtual volume task IDs for which to retrieve information. If unspecified, the command returns information about all virtual volume tasks.

**sfcli VirtualVolume listvolumestatsby <options>**

Description	Options
This command enables you to list volume statistics for any volumes in the system that are associated with virtual volumes. Statistics are cumulative from the creation of the volume.	<b>virtualvolumeids:</b> A list of one or more virtual volume IDs for which to retrieve information. If you specify this option, you get information about only these virtual volumes.

## Volume commands

This section describes the volume commands that you can use in CLI Tools.

**sfcli Volume addtoaccessgroup <options>**

Description	Options
This command enables you to add volumes to a specified volume access group.	<b>volumeaccessgroupid:</b> The ID of the volume access group to which volumes are added. <b>volumes:</b> The list of volumes to add to the volume access group.

**sfcli Volume cancelclone <options>**

Description	Options
This command enables you to stop an ongoing volume clone or volume copy process. When you cancel a group clone operation, the system completes and removes the operation's associated asyncHandle.	<b>cloneid:</b> The cloneID for the ongoing clone process.

**sfcli Volume cancelgroupclone <options>**

Description	Options
This command enables you to stop an ongoing process for cloning multiple volumes. When you cancel a group clone operation, the system completes and removes the operation's associated asyncHandle.	<b>groupcloneid:</b> The cloneID for the ongoing clone process.

**sfcli Volume clone <options>**

Description	Options
<p>This command enables you to create a copy of a volume. The method called is asynchronous and might take a variable amount of time to complete.</p> <p><b>Note:</b> The initial attributes and QoS settings for the volume are inherited from the volume being cloned. You can change these settings with <code>sfcli Volume modify &lt;options&gt;</code>.</p> <p><b>Note:</b> Cloned volumes do not inherit volume access group memberships from the source volume.</p>	<p><code>access</code>: Specifies the level of access allowed for the new volume. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>readOnly</code>: Only read operations are allowed.</li> <li>• <code>readWrite</code>: Reads and writes are allowed.</li> <li>• <code>locked</code>: No reads or writes are allowed. If unspecified, the level of access of the volume being cloned is used.</li> <li>• <code>replicationTarget</code>: Identify a volume as the target volume for a paired set of volumes. If the volume is not paired, the access status is locked. If a value is not specified, the access value does not change.</li> </ul> <p><code>attributes</code>: List of name pairs in JSON object format.</p> <p><code>enable512e</code>: Specifies whether 512e emulation is enabled or not. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>true</code>: The volume provides 512 byte sector emulation.</li> <li>• <code>false</code>: 512e emulation is not enabled.</li> </ul> <p><code>enableSnapMirrorReplication</code>: Specifies whether or not SnapMirror replication is enabled. This value is false by default.</p> <p><code>name</code>: The name of the new cloned volume. Might be 1 to 64 characters in length.</p> <p><code>newaccountid</code>: AccountID for the owner of the new volume. If unspecified, the accountID of the owner of the volume being cloned is used.</p> <p><code>newsiz</code>: New size of the volume, in bytes. Might be greater or less than the size of the volume being cloned. If unspecified, the volume size is not changed. Size is rounded to the nearest 1MB.</p> <p><code>snapshotid</code>: ID of the snapshot that is used as the source of the clone. If no ID is provided, the current active volume is used.</p> <p><code>volumeid</code>: VolumeID for the volume to be cloned.</p>

**sfcli Volume clonemultiple <options>**

Description	Options
<p>This command enables you to create a clone of a group of specified volumes. You can assign a consistent set of characteristics to a group of multiple volumes when they are cloned together.</p> <p><b>Note:</b> Cloning multiple volumes is allowed if cluster fullness is at stage 2 or 3. Clones are not created when cluster fullness is at stage 4 or 5.</p>	<p><b>access:</b> New default access command for the new volumes if not overridden by information passed in the volume's array.</p> <p><b>accessvolumes:</b> Specify the access settings for the new volume:</p> <ul style="list-style-type: none"> <li>• <b>readOnly:</b> Only read operations are allowed.</li> <li>• <b>readWrite:</b> Reads and writes are allowed.</li> <li>• <b>locked:</b> No reads or writes are allowed.</li> <li>• <b>replicationTarget:</b> Identify a volume as the target volume for a paired set of volumes. If the volume is not paired, the access status is locked. If unspecified, the access settings of the clone will be the same as the source.</li> </ul> <p><b>attributes:</b> List of Name/Value pairs in JSON object format.</p> <p><b>groupsnapshotid:</b> ID of the group snapshot to use as a basis for the clone.</p> <p><b>name:</b> Specifies the name for the clone.</p> <p><b>newaccountid:</b> New account ID for the volumes if not overridden by information passed in the volumes array.</p> <p><b>newsiz:</b> Specifies the total size of the volume, in bytes. Size is rounded up to the nearest 1MB size.</p> <p><b>volumes:</b> Unique ID for each volume to include in the clone. The <code>volumes</code> option includes additional options that you can specify. You must specify the <code>volumeid</code> option. The following options are not required:</p> <ul style="list-style-type: none"> <li>• <b>access:</b> Can be one of <code>readOnly</code>, <code>readWrite</code>, <code>locked</code>, or <code>replicationTarget</code>.</li> <li>• <b>attributes:</b> List of name-value pairs in JSON object format.</li> <li>• <b>name:</b> New name for the clone.</li> <li>• <b>newAccountID</b> Account ID for the new volumes.</li> <li>• <b>newSize:</b> New size Total size of the volume, in bytes. Size is rounded up to the nearest 1MB.</li> </ul> <p>If you do not specify options, the values are inherited from the source volumes.</p> <p><b>volumeid:</b> Specifies the volume ID. This is a required parameter.</p>

**sfcli Volume copy <options>**

Description	Options
<p>This command enables you to overwrite the data contents of an existing volume with the data contents of another volume (or snapshot). Attributes of the destination volume such as IQN, QoS settings, size, account, and volume access group membership are not changed. The destination volume must already exist and must be the same size as the source volume. NetApp recommends that clients unmount the destination volume before the volume copy operation begins. If the destination volume is modified during the copy operation, the changes will be lost. The method called is asynchronous and might take a variable amount of time to complete.</p>	<p><code>dstvolumeid</code>: VolumeID of the volume to be overwritten.</p> <p><code>snapshotid</code>: ID of the snapshot that is used as the source of the clone. If no ID is provided, the current active volume is used.</p> <p><code>volumeid</code>: VolumeID of the volume to be read from.</p>

**sfcli Volume create <options>**

Description	Options
<p>This command enables you to create a new (empty) volume on the cluster. As soon as the volume is created, the volume is available for connection via iSCSI.</p>	<p><b>access:</b> The access mode for the volume. Only <code>snapMirrorTarget</code> is allowed.</p> <p><b>accountID:</b> AccountID for the owner of this volume. This is required.</p> <p><b>associateWithQoSPolicy:</b> Associate the volume with the specified QoS policy. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>true</code>: Associate the volume with the QoS policy specified in the <code>QoSPolicyID</code> parameter.</li> <li>• <code>false</code>: Do not associate the volume with the QoS policy specified in the <code>QoSPolicyID</code> parameter. When <code>false</code>, any existing policy association is removed regardless of whether you specify a QoS policy in the <code>QoSPolicyID</code> parameter.</li> </ul> <p><b>attributes:</b> The list of name pairs in JSON object format. Total attribute size must be less than 1000B, or 1KB, including JSON formatting characters.</p> <p><b>enable512e:</b> Specifies whether 512e emulation is enabled or not. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>true</code>: The volume provides 512 byte sector emulation.</li> <li>• <code>false</code>: 512e emulation is not enabled.</li> </ul> <p><b>enableSnapMirrorReplication:</b> Determines whether the volume can be used for replication with <code>SnapMirror</code> endpoints. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>true</code></li> <li>• <code>false</code></li> </ul> <p><b>name:</b> The name of the volume access group (might be user specified). Not required to be unique, but recommended. Might be 1 to 64 characters in length. This is required.</p> <p><b>protectionScheme:</b> Specifies the protection scheme that should be used for this volume. The default value is the <code>defaultProtectionScheme</code> stored in the <code>ClusterInfo</code> object.</p> <p><b>qosburstiops:</b> Desired maximum 4KB IOPS allowed over an extended period of time.</p> <p><b>qosbursttime:</b> The length of time burst IOPS is allowed. The value returned is represented in time units of seconds. Note: this value is calculated by the system based on IOPS set for QoS.</p>

Description continued	Options continued
	<p><code>qoscurve</code>: The curve is a set of key-value pairs. The keys are I/O sizes in bytes. The values represent the cost of performing an IOP at a specific I/O size. The curve is calculated relative to a 4096 byte operation set at 100 IOPS.</p> <p><code>qosmaxiops</code>: Maximum "peak" 4KB IOPS allowed for short periods of time. Allows for bursts of I/O activity over the normal max IOPS value.</p> <p><code>qosminiops</code>: Desired minimum 4KB IOPS to guarantee. The allowed IOPS will only drop below this level if all volumes have been capped at their minimum IOPS value and there is still insufficient performance capacity.</p> <p><code>qospolicyid</code>: The ID for the policy whose QoS settings should be applied to the specified volumes. The volume will not maintain any association with the policy; this is an alternate way to apply QoS settings to the volume. This parameter and the <code>qos</code> parameter cannot be specified at the same time.</p> <p><code>totalSize</code>: Total size of the volume, in bytes. Size is rounded up to the nearest 1MB size. This is required.</p>



**sfcli Volume createqospolicy <options>**

Description	Options
<p>This command enables you to create a <code>QoSPolicy</code> object that you can later apply to a volume upon creation or modification. A QoS policy has a unique ID, a name, and QoS settings.</p>	<p><code>burstiops</code>: Maximum "peak" 4KB IOPS allowed for short periods of time. Allows for bursts of I/O activity over the normal max IOPS value.</p> <p><code>bursttime</code>: The length of time burst IOPS is allowed. The value returned is represented in time units of seconds. Note: this value is calculated by the system based on IOPS set for QoS.</p> <p><code>curve</code>: The curve is a set of key-value pairs. The keys are I/O sizes in bytes. The values represent the cost of performing an IOP at a specific I/O size. The curve is calculated relative to a 4096 byte operation set at 100 IOPS.</p> <p><code>maxiops</code>: Desired maximum 4KB IOPS allowed over an extended period of time.</p> <p><code>miniops</code>: Desired minimum 4KB IOPS to guarantee. The allowed IOPS will only drop below this level if all volumes have been capped at their minimum IOPS value and there is still insufficient performance capacity.</p> <p><code>name</code>: The name of the QoS policy; for example, gold, platinum, or silver.</p> <p><code>qos</code>: The QoS settings that this policy represents.</p>

**sfcli Volume delete <options>**

Description	Options
<p>This command marks an active volume for deletion. When marked, the volume is purged (permanently deleted) after the cleanup interval elapses. After making a request to delete a volume, any active iSCSI connections to the volume are immediately terminated and no further connections are allowed while the volume is in this state. A marked volume is not returned in target discovery requests. Any snapshots of a volume that has been marked for deletion are not affected. Snapshots are kept until the volume is purged from the system. If a volume is marked for deletion and has a bulk volume read or bulk volume write operation in progress, the bulk volume read or write operation is stopped. If the volume you delete is paired with a volume, replication between the paired volumes is suspended and no data is transferred to it or from it while in a deleted state.</p>	<p><code>volumeid</code>: The ID of the volume to be deleted.</p>

**sfcli Volume deleteqospolicy <options>**

Description	Options
This command enables you to delete a QoS policy from the system. The QoS settings for all volumes created or modified with this policy are unaffected.	qospolicyid: The ID of the QoS policy to be deleted.

**sfcli Volume getasyncreult <options>**

Description	Options
This command enables you to retrieve the result of asynchronous method calls. Some method calls require some time to run, and might not be finished when the system sends the initial response.	asynchandle: A value that was returned from the original asynchronous method call. keepresult: If true, GetAsyncResult does not remove the asynchronous result upon returning it, enabling future queries to that asyncHandle.

**sfcli Volume getcount <options>**

Description	Options
This command enables you to retrieve the number of volumes currently in the system.	None

**sfcli Volume getdefaultqos <options>**

Description	Options
This command enables you to retrieve the default QoS values for a newly created volume.	None

**sfcli Volume getefficiency <options>**

Description	Options
This command enables you to retrieve information about a volume. Only the volume you specify is used to compute the capacity.	volumeid: Specifies the volume for which capacity is computed.

**sfcli Volume getqospolicy <options>**

Description	Options
This command enables you to get details about a specific QoS policy from the system.	qospolicyid: The ID of the QoS policy to be retrieved.

**sfcli Volume getstats <options>**

Description	Options
This command enables you to retrieve high-level activity measurements for a single volume. Values are cumulative from the creation of the volume.	volumeid: Specifies the volume for which statistics are gathered.

**sfcli Volume list <options>**

Description	Options
<p>This command enables you to retrieve a list of volumes that are in a cluster. You can specify the volumes you want to return in the list by using the available parameters.</p>	<p><b>accounts:</b> Returns only the volumes owned by the accounts you specify here. Mutually exclusive with the <code>volumeids</code> option.</p> <p><b>includevirtualvolumes:</b> Specifies that virtual volumes are included in the response by default. To exclude virtual volumes, set to <code>false</code>.</p> <p><b>ispaired:</b> Returns volumes that are paired or not paired. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>true</code>: Returns all paired volumes.</li> <li>• <code>false</code>: Returns all volumes that are not paired.</li> </ul> <p><b>limit:</b> Specifies the maximum number of volume results that are returned. Mutually exclusive with the <code>volumeids</code> option.</p> <p><b>protectionSchemes:</b> Specifies that only volumes that are using one of the protection schemes in this set are returned.</p> <p><b>startvolumeid:</b> Only volumes with an ID greater than or equal to this value are returned. Mutually exclusive with the <code>volumeids</code> option.</p> <p><b>volumeids:</b> A list of volume IDs. If you specify this option, other options operate only on this set of volumes. Mutually exclusive with the <code>accounts</code>, <code>startvolumeid</code>, and <code>limit</code> options.</p> <p><b>volumename:</b> Only volume object information matching the volume name is returned.</p> <p><b>volumestatus:</b> Only volumes with a status equal to the status value are returned. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>creating</code></li> <li>• <code>snapshotting</code></li> <li>• <code>active</code></li> <li>• <code>deleted</code></li> </ul>

**sfcli Volume listactive <options>**

Description	Options
<p>This command enables you to return the list of active volumes currently in the system. The list of volumes is returned sorted in VolumeID order and can be returned in multiple parts (pages).</p>	<p><b>includevirtualvolumes:</b> Specifies that virtual volumes are included in the response by default. To exclude virtual volumes, set to false.</p> <p><b>limit:</b> Maximum number of Volume Info objects to return. A value of 0 (zero) returns all volumes (unlimit).</p> <p><b>startvolumeid:</b> Starting VolumeID to return. If no volume exists with this VolumeID, the next volume by VolumeID order is used as the start of the list.</p>

**sfcli Volume listasyncreresults <options>**

Description	Options
<p>This command lists the results of all currently running and completed asynchronous methods on the system.</p>	<p><b>asyncreresulttypes:</b> An optional list of types of results. You can use this list to restrict the results to only these types of operations. Possible values are:</p> <ul style="list-style-type: none"> <li>• BulkVolume: Copy operations between volumes, such as backups or restores.</li> <li>• Clone: Volume cloning operations.</li> <li>• DriveRemoval: Operations involving the system copying data from a drive in preparation to remove it from the cluster.</li> <li>• RtfiPendingNode: Operations involving the system installing compatible software on a node before adding it to the cluster.</li> </ul>

**sfcli Volume listbulkjobs <options>**

Description	Options
<p>This command enables you to retrieve information about each bulk volume read or write operation that is occurring in the system.</p>	<p>None</p>

**sfcli Volume listdeleted <options>**

Description	Options
<p>This command enables you to retrieve the list of volumes that have been marked for deletion and purged from the system.</p>	<p><b>includevirtualvolumes:</b> Specifies that virtual volumes are included in the response by default. To exclude virtual volumes, set to false.</p>

**sfcli Volume listforaccount <options>**

Description	Options
<p>This command returns the list of active and (pending) deleted volumes for an account.</p>	<p><code>accountid</code>: Returns all volumes owned by this AccountID.</p> <p><code>includevirtualvolumes</code>: Specifies that virtual volumes are included in the response by default. To exclude virtual volumes, set to false.</p> <p><code>limit</code>: The maximum number of volumes to return from the API.</p> <p><code>startvolumeid</code>: The ID of the first volume to list. This can be useful for paging results. By default, this starts at the lowest VolumeID.</p>

**sfcli Volume listqoshistograms <options>**

Description	Options
<p>This command enables you to return histograms detailing volume performance relative to QoS settings. It may take up to 5 seconds for newly created volumes to have accurate histogram data available.</p>	<p><code>volumeids</code>: A list of volumes from which to retrieve performance histograms. If no volumes are specified then information for all volumes will be returned.</p>

**sfcli Volume listqospolicies <options>**

Description	Options
<p>This command enables you to list the settings of all QoS policies on the system.</p>	<p>None</p>

**sfcli Volume liststats <options>**

Description	Options
<p>This command returns high-level activity measurements for a volume, list of volumes, or all volumes (if you omit the <code>volumeids</code> option). Measurement values are cumulative from the creation of the volume.</p>	<p><code>volumeids</code>: A list of volumes from which to retrieve activity information.</p>

**sfcli Volume liststatsby <options>**

Description	Options
<p>This command returns high-level activity measurements for every volume, by volume. Values are cumulative from the creation of the volume.</p>	<p><code>includevirtualvolumes</code>: Specifies that virtual volumes are included in the response by default. To exclude virtual volumes, set to false.</p>

**sfcli Volume liststatsbyaccessgroup <options>**

Description	Options
This command enables you to get total activity measurements for all of the volumes that are members of the specified volume access group(s).	<b>includevirtualvolumes:</b> Specifies that virtual volumes are included in the response by default. To exclude virtual volumes, set to false. <b>volumeaccessgroups:</b> An array of VolumeAccessGroupIDs for which volume activity is returned. If omitted, statistics for all volume access groups are returned.

**sfcli Volume liststatsbyaccount <options>**

Description	Options
This command returns high-level activity measurements for every account. Values are summed from all the volumes owned by the account.	<b>accounts:</b> One or more account IDs by which to filter the result. <b>includevirtualvolumes:</b> Includes virtual volumes in the response by default. To exclude virtual volumes, set to false.

**sfcli Volume modify <options>**

Description	Options
<p>This command enables you to modify settings on an existing volume. You can make modifications to one volume at a time and changes take place immediately. If you do not specify QoS values when you modify a volume, they remain the same as before the modification.</p> <p><b>Note:</b> If you change the value of the <code>access</code> option to "locked" or "replicationTarget", all existing iSCSI connections are terminated.</p>	<p><code>access</code>: Specifies the access allowed for the volume. Possible values are:</p> <ul style="list-style-type: none"> <li>• <code>readOnly</code>: Only read operations are allowed</li> <li>• <code>readWrite</code>: Reads and writes are allowed</li> <li>• <code>locked</code>: No reads or writes are allowed</li> </ul> <p>If not specified, the access value does not change. <code>replicationTarget</code>: Identify a volume as the target volume for a paired set of volumes. If the volume is not paired, the access status is locked. If a value is not specified, the access value does not change.</p> <p><code>accountID</code>: AccountID to which the volume is reassigned. If unspecified, the previous account name is used.</p> <p><code>associateWithQoSPolicy</code>: Associate the volume with the specified QoS policy. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>true</code>: Associate the volume with the QoS policy specified in the <code>QoSPolicyID</code> parameter</li> <li>• <code>false</code>: Do not associate the volume with the QoS policy specified in the <code>QoSPolicyID</code> parameter</li> </ul> <p>When false, any existing policy association is removed regardless of whether you specify a QoS policy in the <code>QoSPolicyID</code> parameter.</p> <p><code>attributes</code>: List of name-value pairs in JSON object format.</p> <p><code>enableSnapMirrorReplication</code>: Determines whether the volume can be used for replication with SnapMirror endpoints. Possible values:</p> <ul style="list-style-type: none"> <li>• <code>true</code></li> <li>• <code>false</code></li> </ul> <p><code>qos</code>: New QoS settings for this volume. If not specified, the QoS settings are not changed.</p> <p><code>qosburstiops</code>: Desired maximum 4KB IOPS allowed over an extended period of time.</p> <p><code>qosbursttime</code>: The length of time burst IOPS is allowed. The value returned is represented in time units of seconds. Note: this value is calculated by the system based on IOPS set for QoS.</p> <p><code>qoscurve</code>: The curve is a set of key-value pairs. The keys are I/O sizes in bytes. The values represent the cost of performing an IOP at a specific I/O size. The curve is calculated relative to a 4096 byte operation set at 100 IOPS.</p>

Description continued	Options continued
	<p><code>qosmaxiops</code>: Maximum "peak" 4KB IOPS allowed for short periods of time. Allows for bursts of I/O activity over the normal max IOPS value.</p> <p><code>qosminiops</code>: Desired minimum 4KB IOPS to guarantee. The allowed IOPS will only drop below this level if all volumes have been capped at their minimum IOPS value and there is still insufficient performance capacity.</p> <p><code>qosPolicyID</code>: The ID for the policy whose QoS settings should be applied to the specified volumes. The volume will not maintain any association with the policy; this is an alternate way to apply QoS settings to the volume. This parameter and the <code>qos</code> parameter cannot be specified at the same time.</p> <p><code>totalsize</code>: New size of the volume in bytes. 1000000000 is equal to 1GB. Size is rounded up to the nearest 1MB. You can use this option only to increase the size of a volume.</p> <p><code>volumeid</code>: VolumeID for the volume to be modified. This is required.</p>



**sfcli Volume modifyqospolicy <options>**

Description	Options
<p>This command enables you to modify an existing QoS policy on the system.</p>	<p><b>name:</b> If supplied, the name of the QoS policy (for example, gold, platinum, or silver) is changed to this value.</p> <p><b>qosburstiops:</b> If supplied, the maximum "peak" 4KB IOPS allowed for short periods of time. Allows for bursts of I/O activity over the normal max IOPS value.</p> <p><b>qosbursttime:</b> If supplied, the length of time burst IOPS is allowed. The value returned is represented in time units of seconds. Note: this value is calculated by the system based on IOPS set for QoS.</p> <p><b>qoscurve:</b> If supplied, the curve is a set of key-value pairs. The keys are I/O sizes in bytes. The values represent the cost of performing an IOP at a specific I/O size. The curve is calculated relative to a 4096 byte operation set at 100 IOPS.</p> <p><b>qosmaxiops:</b> If supplied, the desired maximum 4KB IOPS allowed over an extended period of time.</p> <p><b>qosminiops:</b> If supplied, the desired minimum 4KB IOPS to guarantee. The allowed IOPS will only drop below this level if all volumes have been capped at their minimum IOPS value and there is still insufficient performance capacity.</p> <p><b>qospolicyid:</b> The ID of the QoS policy to be modified.</p>

**sfcli Volume purgedeleted <options>**

Description	Options
<p>This command immediately and permanently purges a volume that has been deleted. You must delete a volume before it can be purged. Volumes are purged automatically after a period of time, so you might not need to use this command.</p>	<p><b>volumeid:</b> The ID of the volume to be purged.</p>

**sfcli Volume removefromaccessgroup <options>**

Description	Options
<p>This command enables you to remove volumes from a volume access group.</p>	<p><b>volumeaccessgroupid:</b> The ID of the volume access group to remove volumes from.</p> <p><b>volumes:</b> Volumes to remove from the volume access group.</p>

**sfcli Volume restoredeleted** <options>

Description	Options
This command marks a deleted volume as active again. This action makes the volume immediately available for iSCSI connection.	volumeid: VolumeID of the deleted volume to be restored.

**sfcli Volume setdefaultqos** <options>

Description	Options
This command enables you to configure the default Quality of Service (QoS) values (measured in inputs and outputs per second, or IOPS) for a volume. For more information about QoS in a SolidFire storage cluster, see the <i>Element User Guide</i> .	burstiops: The maximum number of IOPS allowed in a short burst scenario. maxiops: The maximum number of sustained IOPS provided by the cluster to a volume. miniops: The minimum number of sustained IOPS provided by the cluster to a volume.

**sfcli Volume startbulkread** <options>

Description	Options
This command enables you to initialize a bulk volume read session on a specified volume. Only two bulk volume processes can run simultaneously on a volume.  <b>Note:</b> This process creates a new snapshot if the ID of an existing snapshot is not provided. Snapshots can be created if cluster fullness is at stage 2 or 3. Snapshots are not created when cluster fullness is at stage 4 or 5.	attributes: JSON attributes for the bulk volume job. format: The format of the volume data. It can be either of the following: <ul style="list-style-type: none"> <li>• uncompressed: Every byte of the volume is returned without any compression.</li> <li>• native: Opaque data is returned that is smaller and more efficiently stored and written on a subsequent bulk volume write.</li> </ul> script: The executable name of a script. If unspecified, the key and URL are necessary to access SF-series nodes. The script is run on the primary node, and the key and URL are returned to the script, so the local web server can be contacted. scriptparameters: JSON parameters to pass to the script snapshotid: The ID of a previously created snapshot used for bulk volume reads. If no ID is entered, a snapshot of the current active volume image is made. volumeid: The ID of the volume to be read.

**sfcli Volume startbulkwrite <options>**

Description	Options
<p>This command enables you to initialize a bulk volume write session on a specified volume. Only two bulk volume processes can run simultaneously on a volume. When you initialize the write session, data is written to a SolidFire storage volume from an external backup source. The external data is accessed by a web server running on an SF-series node. Communications and server interaction information for external data access is passed by a script running on the storage system.</p>	<p><b>attributes:</b> JSON attributes for the bulk volume job.</p> <p><b>format:</b> The format of the volume data. It can be either of the following:</p> <ul style="list-style-type: none"> <li>• <b>uncompressed:</b> Every byte of the volume is returned without any compression.</li> <li>• <b>native:</b> Opaque data is returned that is smaller and more efficiently stored and written on a subsequent bulk volume write.</li> </ul> <p><b>script:</b> The executable name of a script. If unspecified, the key and URL are necessary to access SF-series nodes. The script runs on the primary node and the key and URL are returned to the script, so the local web server can be contacted.</p> <p><b>scriptparameters:</b> JSON parameters to pass to the script</p> <p><b>volumeid:</b> The ID of the volume to be written to.</p>

**sfcli Volume updatebulkstatus <options>**

Description	Options
<p>This command enables you to update the status of a bulk volume job that you started with <code>sfcli Volume startbulkread &lt;options&gt;</code> or <code>sfcli Volume startbulkwrite &lt;options&gt;</code>.</p>	<p><b>attributes:</b> JSON attributes; updates what is on the bulk volume job.</p> <p><b>key:</b> The key assigned during initialization of a <code>StartBulkVolumeRead</code> or <code>StartBulkVolumeWrite</code> session.</p> <p><b>message:</b> The message returned indicating the status of the bulk volume job after the job is complete.</p> <p><b>percentcomplete:</b> The completed progress of the bulk volume job as a percentage value.</p> <p><b>status:</b> The status of the given bulk volume job. The system sets the status. Possible values are:</p> <ul style="list-style-type: none"> <li>• <b>running:</b> Jobs that are still active.</li> <li>• <b>complete:</b> Jobs that are done.</li> <li>• <b>failed:</b> Jobs that failed.</li> </ul>

## Volume access group commands

This section describes commands that you can use to create volume access groups, retrieve information about the volume access groups in the system, and so on.

### sfcli VolumeAccessGroup create <options>

Description	Options
<p>This command enables you to create a new volume access group. When you create the volume access group, you need to give it a name, and you can optionally enter initiators and volumes. After you create the group, you can add volumes and initiator IQNs. Any initiator IQN that you add to the volume access group is able to access any volume in the group without CHAP authentication.</p>	<p><b>attributes:</b> List of name-value pairs in JSON object format.</p> <p><b>initiators:</b> List of initiators to include in the volume access group. If unspecified, the access group's configured initiators are not modified.</p> <p><b>name:</b> The name for this volume access group. Not required to be unique, but recommended.</p> <p><b>virtualnetworkid:</b> The ID of the virtual network to associate the volume access group with.</p> <p><b>virtualnetworktags:</b> The ID of the VLAN virtual network tag to associate the volume access group with.</p> <p><b>volumes:</b> List of volumes to initially include in the volume access group. If unspecified, the access group's volumes are not modified.</p>

### sfcli VolumeAccessGroup delete <options>

Description	Options
<p>This command enables you to delete a volume access group.</p>	<p><b>deleteOrphanInitiators:</b> Specifies whether or not orphan initiators should be deleted.</p> <ul style="list-style-type: none"> <li><b>true:</b> Default. Delete initiator objects after they are removed from a volume access group.</li> <li><b>false:</b> Do not delete initiator objects after they are removed from a volume access group.</li> </ul> <p><b>volumeaccessgroupid:</b> Specifies the ID of the volume access group to be deleted.</p>

### sfcli VolumeAccessGroup getefficiency <options>

Description	Options
<p>This command enables you to retrieve efficiency information about a volume access group. Only the volume access group you provide as the option for this command is used to compute the capacity.</p>	<p><b>volumeaccessgroupid:</b> The volume access group for which capacity is computed.</p>

### sfcli VolumeAccessGroup getlunassignments <options>

Description	Options
<p>This command enables you to retrieve details on LUN mappings of a specified volume access group.</p>	<p><b>volumeaccessgroupid:</b> The unique volume access group ID used to return information.</p>

**sfcli VolumeAccessGroup list <options>**

Description	Options
<p>This command enables you to return information about the volume access groups that are currently in the system.</p>	<p><b>limit:</b> The maximum number of results to return. This can be useful for paging.</p> <p><b>startvolumeaccessgroupid:</b> The volume access group ID at which to begin the listing. If unspecified, there is no lower limit (implicitly 0).</p> <p><b>volumeaccessgroups:</b> The list of IDs of the volume access groups you wish to list.</p>

**sfcli VolumeAccessGroup modify <options>**

Description	Options
<p>This command enables you to update initiators and add or remove volumes from a volume access group. If a specified initiator or volume is a duplicate of what currently exists, the volume access group is not modified. If you do not specify a value for volumes or initiators, the current list of initiators and volumes is not changed.</p>	<p><b>attributes:</b> List of name-value pairs in JSON object format.</p> <p><b>deleteOrphanInitiators:</b> Specifies whether or not orphan initiators should be deleted.</p> <ul style="list-style-type: none"> <li>• <b>true:</b> Default. Delete initiator objects after they are removed from a volume access group.</li> <li>• <b>false:</b> Do not delete initiator objects after they are removed from a volume access group.</li> </ul> <p><b>initiators:</b> List of initiators to include in the volume access group. If unspecified, the access group's configured initiators are not modified.</p> <p><b>name:</b> The new name for this volume access group. Not required to be unique, but recommended.</p> <p><b>virtualnetworkid:</b> The ID of the virtual network to associate the volume access group with.</p> <p><b>virtualnetworktags:</b> The ID of the VLAN virtual network tag to associate the volume access group with.</p> <p><b>volumeaccessgroupid:</b> The ID of the volume access group to modify.</p> <p><b>volumes:</b> List of volumes to initially include in the volume access group. If unspecified, the access group's volumes are not modified.</p>

**sfcli VolumeAccessGroup modifylunassignments <options>**

Description	Options
<p>This command enables you to define custom LUN assignments for specific volumes. It changes only LUN values specified in the <code>lunassignments</code> option in the volume access group. All other LUN assignments remain unchanged.</p>	<p><b>lun:</b> Correct LUN values are 0 - 16383. An exception will be seen if an incorrect LUN value is passed.</p> <p><b>lunassignments:</b> The volume IDs with new assigned LUN values.</p> <p><b>volumeaccessgroupid:</b> Unique volume access group ID for which the LUN assignments will be modified.</p> <p><b>volumeid:</b> The volume ID assigned to the LUN.</p>

LUN assignment values must be unique for volumes in a volume access group. You cannot define duplicate LUN values within a volume access group. However, you can use the same LUN values again in different volume access groups.

**Note:** Correct LUN values are 0 through 16383. The system generates an exception if you pass a LUN value outside of this range. None of the specified LUN assignments are modified if there is an exception.



**CAUTION:** If you change a LUN assignment for a volume with active I/O, the I/O can be disrupted. You might need to change the server configuration before changing volume LUN assignments.

**sfcli VolumeAccessGroup removeinitiatorsfrom <options>**

Description	Options
This command enables you to remove initiators from a specified volume access group.	<p><code>deleteOrphanInitiators</code>: Specifies whether or not orphan initiators should be deleted.</p> <ul style="list-style-type: none"><li>• <code>true</code>: Default. Delete initiator objects after they are removed from a volume access group.</li><li>• <code>false</code>: Do not delete initiator objects after they are removed from a volume access group.</li></ul> <p>This item is optional.</p> <p><code>initiators</code>: Specifies the list of initiators to remove from the volume access group.</p> <p><code>volumeaccessgroupid</code>: Specifies the ID of the volume access group to be deleted.</p>

## **Where to find product documentation and other information**

You can learn more about using and managing NetApp HCI and SolidFire all-flash storage from the resources available in the Documentation Centers and Resources pages for both products.

In the Documentation Centers, you can also find information about hardware installation and maintenance, additional content resources available, links to known issues and resolved issues, and the latest release notes. On the Resources pages, you can find links to data sheets, technical reports, white papers, and videos.

- [\*NetApp HCI Documentation\*](#)
- [\*NetApp HCI Documentation Center\*](#)
- [\*NetApp HCI Resources page\*](#)
- [\*SolidFire and Element 12.2 Documentation Center\*](#)
- [\*SolidFire and Element 12.0 Documentation Center\*](#)
- [\*SolidFire and Element 11.8 Documentation Center\*](#)
- [\*SolidFire and Element 11.7 Documentation Center\*](#)
- [\*SolidFire and Element 11.5 Documentation Center\*](#)
- [\*SolidFire Resources page\*](#)

## Contacting NetApp Support

---

If you need help with or have questions or comments about NetApp products, contact NetApp Support.

- Web:  
[mysupport.netapp.com](https://mysupport.netapp.com)
- Phone:
  - 888.4.NETAPP (888.463.8277) (US and Canada)
  - 00.800.44.638277 (EMEA/Europe)
  - +800.800.80.800 (Asia/Pacific)



## Copyright

---

Copyright © 2020 NetApp, Inc. All rights reserved. Printed in the U.S.

No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

Data contained herein pertains to a commercial item (as defined in FAR 2.101) and is proprietary to NetApp, Inc. The U.S. Government has a non-exclusive, non-transferrable, non-sublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b).

## Trademark

---

NETAPP, the NETAPP logo, and the marks listed on the NetApp Trademarks page are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.

<http://www.netapp.com/us/legal/netapptmlist.aspx>

## How to send comments about documentation and receive update notifications

---

You can help us to improve the quality of our documentation by sending us your feedback. You can receive automatic notification when production-level (GA/FCS) documentation is initially released or important changes are made to existing production-level documents.

If you have suggestions for improving this document, send us your comments by email.

[\*doccomments@netapp.com\*](mailto:doccomments@netapp.com)

To help us direct your comments to the correct division, include in the subject line the product name, version, and operating system.

If you want to be notified automatically when production-level documentation is released or important changes are made to existing production-level documents, follow Twitter account @NetAppDoc.

You can also contact us in the following ways:

- NetApp, Inc., 1395 Crossman Ave., Sunnyvale, CA 94089 U.S.
- Telephone: +1 (408) 822-6000
- Fax: +1 (408) 822-4501
- Support telephone: +1 (888) 463-8277