NetApp Element

PowerShell Tools User Guide

Version 1.6

July 2020 | 215-14886_A0
doccomments@netapp.com

NetApp®

Contents

Introduction

NetApp Element PowerShell Tools is a collection of PowerShell Core functions that use Element storage API to control an Element storage system. These functions allow administrators to query for information, make changes to objects in a storage system, and develop complex scripts on a single platform. You can use this module with other modules and snap-ins, such as VMware PowerCLI to extend capabilities throughout the infrastructure.

Any user with an Element storage system and PowerShell Core can take advantage of NetApp Element PowerShell Tools. Before you use NetApp Element PowerShell Tools, you should have an understanding of PowerShell Core functions.

You can download the NetApp Element PowerShell Tools Install guide and software from the NetApp Support *Site*.

How to use NetApp Element PowerShell Tools

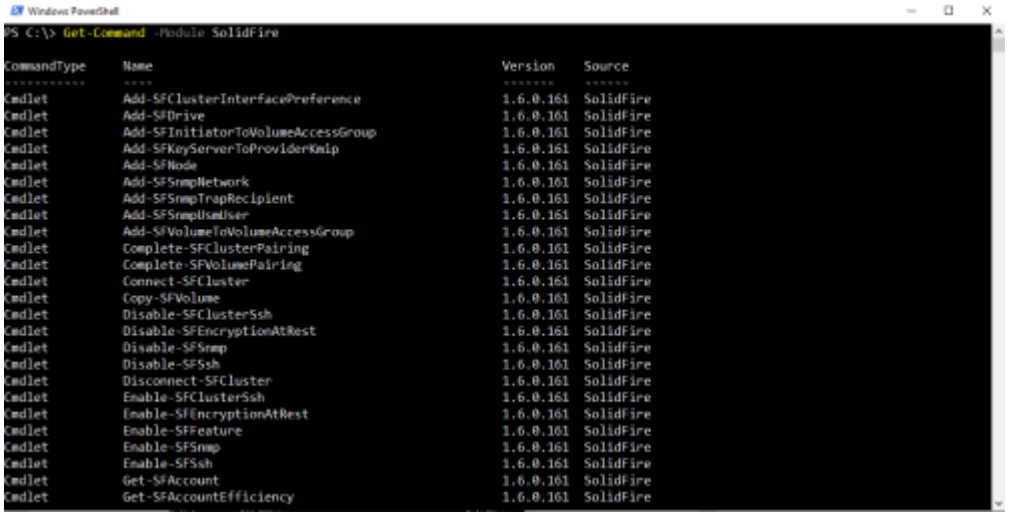
The following topics describe ways to access available functions for NetApp Element PowerShell Tools, manage connections to an Element storage node, and find additional cmdlet parameter and return object information.

Listing available functions

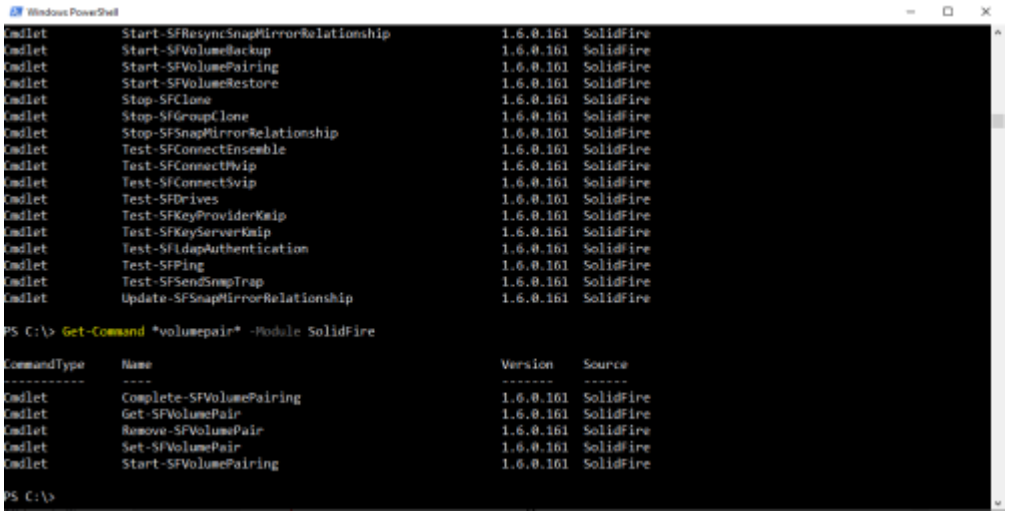
The available functions for NetApp Element PowerShell Tools can be explored using the native Get-Command PowerShell Tools cmdlet.

Steps

1. In the command line interface, type the following: `Get-Command –Module SolidFire`
   The list of available commands appears.



2. Type a search term with an asterisk before and after the term to filter the command list: `Get-Command *volumepair* –Module SolidFire`
   The filtered list of available commands appears.



Accessing embedded help

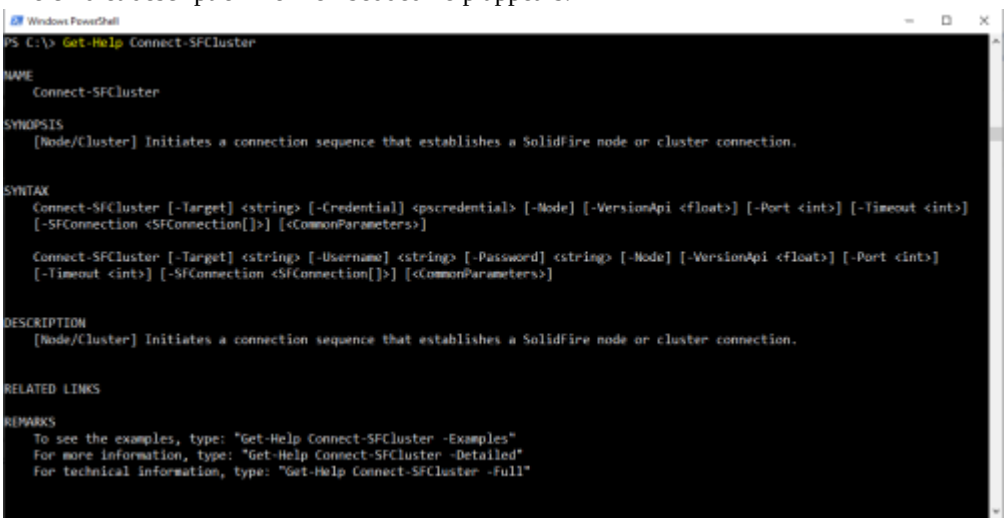
NetApp Element PowerShell Tools contains help examples that are accessible through the command line. Help content includes details about each command and examples of each function in use.

Step

In the command line interface, type

`Get-Help <cmdlet>`

The cmdlet description from embedded help appears.



Note: To view full cmdlet help, see *Accessing return values using Get-Help*.

Accessing return values using Get-Help on page 9

Parameter sets

Many of the functions for NetApp Element PowerShell Tools have parameter sets to allow multiple use cases. For example, parameter sets are used with the creation and modification of Element storage objects, such as `Accounts`, `Volumes`, and `Volume Access Groups`.

You can identify parameter sets by using `Get-Help` for the function and reviewing the content under the Syntax section.

Managing connections to an Element storage cluster

All of the functions in NetApp Element PowerShell Tools make direct calls to the Element storage API. In order to manage authentication efficiently, a connection function has been developed for collecting target and authentication information.

Connecting to an Element storage cluster

Use `Connect-SFCluster` to connect to an Element storage cluster. The function collects Cluster connection, including target and authentication information from the user. `Connect-SFCluster` also supports connections to multiple Element storage clusters.

About this task

By default, the `Connect-SFCluster` queries the target cluster and sets the connection information to the latest API version on the cluster. This could also change the URI property to the version of Element software you are using. See *Changing API versions* to specify an API.

Changing API versions on page 7

Step

In the command line interface, type

`Connect-SFCluster -Target "<address>"`

The following example shows a successful connection.

Note: If your connection to an Element storage cluster is successful, the function `Connect-SFCluster` stores credentials and target information into a global variable `$SFConnection`. Multiple connections are also supported, and each successful connection is stored in the global array variable `$SFConnection`. See *Global variables for all functions*.

Global variables for all functions on page 8

Connecting to an Element storage node

Use the `Connect-SFCluster` function with a -Node switch parameter to connect to a specific Element storage node.

Steps

1. In the command line interface, type the following to get the IP address for the node:

   `Get-SFNode | Select Name, ManagementIP, NodeID`

2. Include -Node and provide the node IP address in order to connect.

   `Connect-SFCluster -Target <NodeIP> -UserName <AdminAccount> -Node:`

Disconnecting from an Element storage cluster or node

Use the `Disconnect-SFCluster` function to disconnect from an Element storage cluster. The function also clears the `$SFConnection` and `$SFConnections` global variables from the session. This makes it easier to secure the shell if you wish to keep it active or work with a different Element storage cluster.

About this task

You can disconnect a specific connection using the name of the connection from the `$SFConnection` or `$SFConnections` global variables. This name is either the cluster or the node name. See *Global variables for all functions* for an example.

Global variables for all functions on page 8

Step

In the command line interface, type the following to disconnect from the cluster:

`Disconnect-SFCluster`

Note: You can add an optional extension -Name <node or cluster name> or optional -Target parameter to specify the IP address instead of the name.

The following example shows a successful disconnection.

Changing API versions

Use `–VersionApi` to specify an Element storage API version. By default, the NetApp Element PowerShell Tools module will use the most recent version of the Element storage API available.

About this task

Note: Changing versions might produce unexpected results based on availability of features and possible API method changes between releases. Even if a connection to an API version works, not all new features might be available in the NetApp Element PowerShell Tools module version that you have installed.

Step

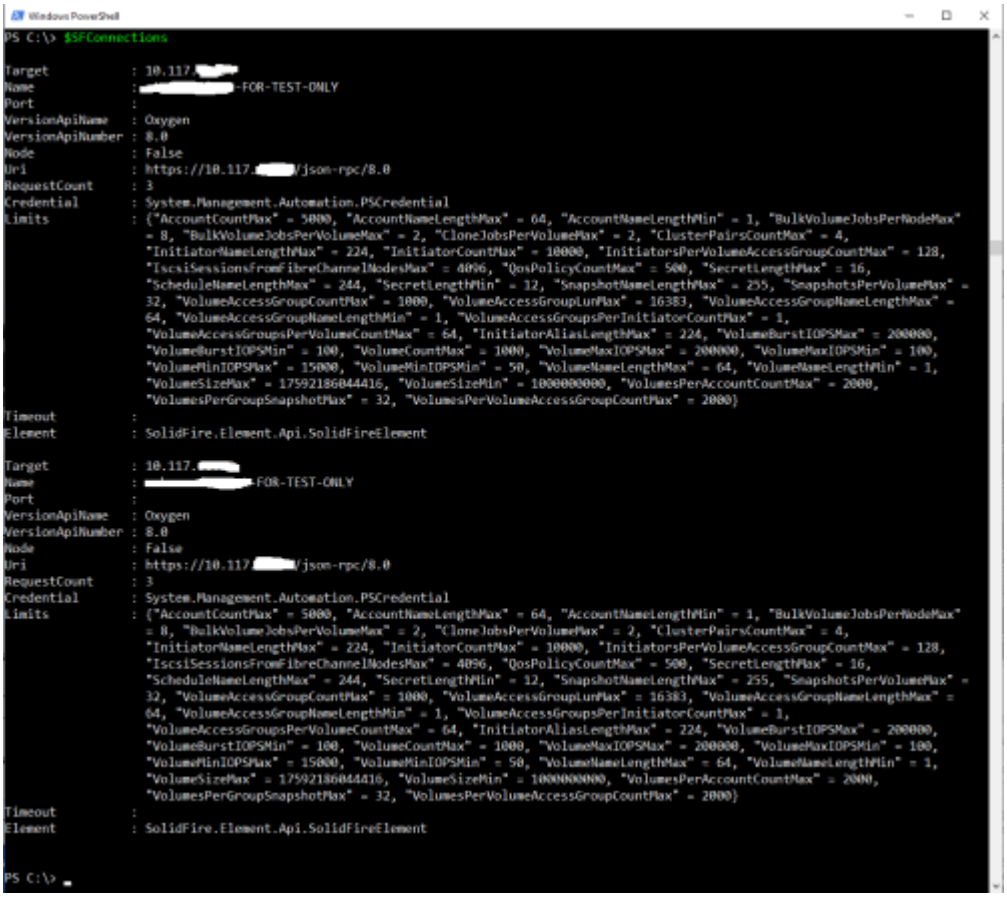
Type the following command into the command line to specify the API version:

`Connect-SFCluster -Target <address> –VersionApi <version number>`
The following example demonstrates connecting to an Element storage cluster with API version 8.0 (Oxygen).

Global variables for all functions

If your connection to an Element storage API cluster is successful, the function `Connect-SFCluster` stores credentials and target information in a global variable `$SFConnection`.

The information in this variable is used in API calls of other NetApp Element PowerShell Tools functions. Multiple connections are also supported, and each successful connection is stored in the global array variable `$SFConnections`.



Common parameters

All cmdlets, with the exception of `Connect-SFCluster` and `Disconnect-SFCluster`, have the common parameters Target and SFConnection. These common parameters are not in the Get-Help examples for each cmdlet but can be assumed to be present. The embedded Help within NetApp Element PowerShell Tools has the common parameter in its examples.

If the Target parameter is included in the cmdlet, the cmdlet will run against all connections in `$SFConnections` whose name or target (IP address) matches using a wildcard pattern match. Results are written to output without indicating the target against which the cmdlet was run.

If the -SFConnection parameter is included in the cmdlet, the cmdlet will run against the specific SFConnection that was handed in through that parameter. You can inspect the `$SFConnections` session variable to find a specific SFConnection or you can pass the result of `Connect-SFCluster` into it.

Each cmdlet is configured to be run on either a cluster or node. Before processing the cmdlet against any target, the cmdlet will check the connection to make sure it matches the intended cluster or node. If there is no match, a non-terminating error message (as in the following example) appears that states it is skipping the command:

```
Get-SFNetworkConfig : Skipping command on connection 'Connection Name'. CmdLet requires Node connection.
```

All cmdlets will execute against all matching connections.

Return object descriptions

Return values are fully documented as part of the .NET SDK documentation that is available online.

There are three methods for inspecting cmdlet return values:

- *Accessing return value reference documentation* on page 9
- *Accessing return values using Get-Help* on page 9
- *Leveraging Get-Member to inspect return objects* on page 10

Accessing return value reference documentation

Each return value is documented as part of the online documentation for the Element .NET SDK.

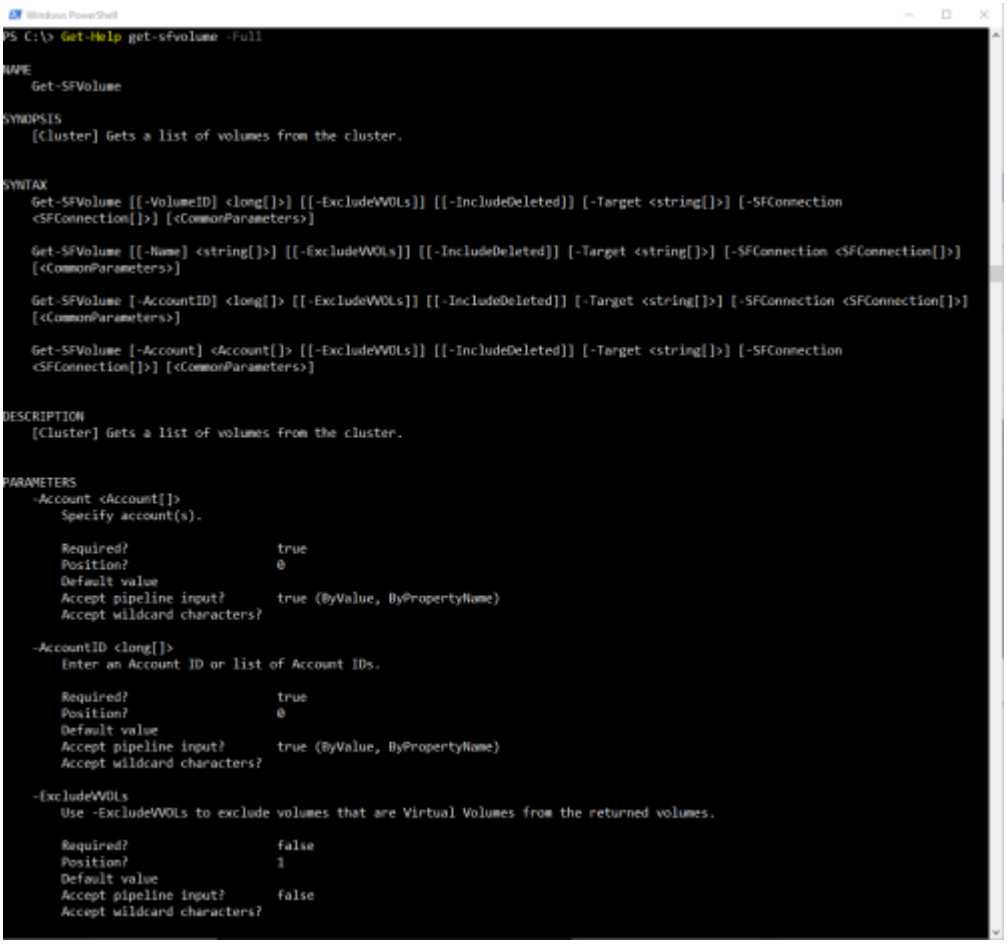
This documentation can be found on the *NetApp Support site*.

Accessing return values using Get-Help

For any cmdlet included in NetApp Element PowerShell Tools, type `Get-Help <cmdlet name> -Full` to return command details.

- A specific return type for the cmdlet that is described in the Outputs section.
- A URL to the related Element .NET SDK reference page on GitHub.
- Examples of cmdlet use.

The following is an example of `Get-Help <cmdlet name> -Full`:



Leveraging Get-Member to inspect return objects

Use the built-in NetApp Element PowerShell Tools `Get-Member` cmdlet to inspect return values.

Steps

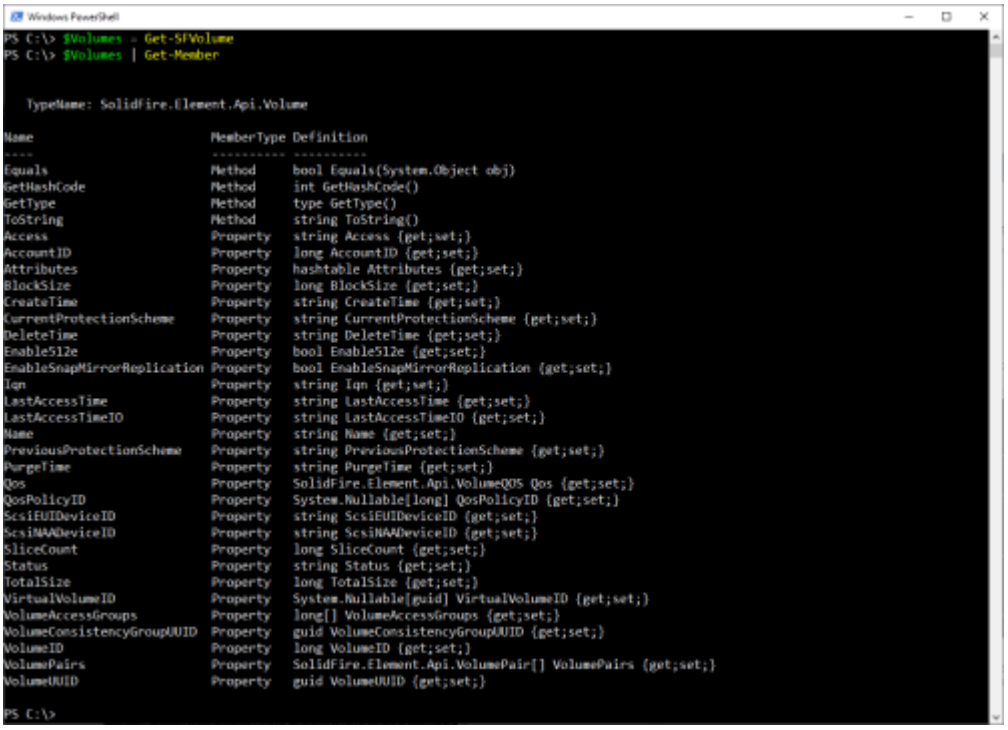
1. In the command line interface, type:

   `$<variable> = <Cmdlet with appropriate parameters>`

2. Type:

   `$<variable> | Get-Member`

   The following example shows the result for `Get-SFVolume` with each return property listed.



3. If objects are more than one layer deep (see the QoS property in the example from the previous step), examine additional layers using the dot operator:

   `$<variable.property> | Get-Member`

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 Center*
- *NetApp HCI Resources page*
- *SolidFire and Element 11.8 Documentation Center*
- *SolidFire and Element 11.7 Documentation Center*
- *SolidFire and Element 11.5 Documentation Center*
- *SolidFire and Element 11.3 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
- Phone:
  - 888.4.NETAPP (888.463.8277) (US and Canada)
  - 00.800.44.638277 (EMEA/Europe)
  - +800.800.80.800 (Asia/Pacific)

Copyright

Trademark

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

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