Dell EMC Metro node 7.0.1
CLI Guide

7.0.1

D&LL Technologies

Notes, cautions, and warnings

> (i) **NOTE:** A NOTE indicates important information that helps you make better use of your product.

> ⚠ **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

> ⚠ **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

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Preface

As part of an effort to improve its product lines, Dell EMC periodically releases revisions of its software and hardware. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features.

Contact your Dell EMC technical support professional if a product does not function properly or does not function as described in this document.

(i) **NOTE:** This document was accurate at publication time. Go to Dell EMC Online Support (https://www.dell.com/support) to ensure that you are using the latest version of this document.

Purpose

This document is part of the VPLEX documentation set, and describes the VPLEX features and use cases, configuration options, VPLEX software and its upgrade, and the hardware overview.

Audience

This guide is intended for use by customers who wish to understand the software and hardware features of VPLEX, the use cases of VPLEX, product offerings, and the configuration options.

Related documents (available on Dell EMC Online Support and SolVe) include:

● *Release Notes for the metro node appliance*
● *Product Guide or the metro node appliance*
● *Metro node Hardware Installation Guide*
● *Configuration and Installation Guide for the metro node appliance*
● *Security Configuration Guide for the metro node appliance*
● *CLI Reference Guide for the metro node appliance*
● *Administration Guide for the metro node appliance*
● Online Help for the metro node appliance
● *REST API v2 for the metro node appliance*
● *Open Source Licenses Guide for the metro node appliance*
● *Hardware Reference Guide for the metro node appliance*
● Procedures provided through the SolVe

Special notice conventions used in this document

Dell EMC uses the following conventions for special notices:

⚠️ **CAUTION: Indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

⚠️ **CAUTION: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ **CAUTION: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

ⓘ **NOTE:** Addresses practices not related to personal injury.

ⓘ **NOTE:** Presents information that is important, but not hazard-related.

Typographical conventions

Dell EMC uses the following type style conventions in this document:

Table 1. Typographical conventions

Bold	Used for names of interface elements, such as names of windows, dialog boxes, buttons, fields, tab names, key names, and menu paths (what the user specifically selects or clicks)
italic	Used for full titles of publications referenced in text
`Monospace`	Used for: ● System code ● System output, such as an error message or script ● Pathnames, filenames, prompts, and syntax ● Commands and options
Monospace italic	Used for variables
`Monospace bold`	Used for user input
[ ]	Square brackets enclose optional values
|	Vertical bar indicates alternate selections - the bar means "or"
{ }	Braces enclose content that the user must specify, such as x or y or z
…	Ellipses indicate nonessential information omitted from the example

Where to get help

Dell EMC support, product, and licensing information can be obtained as follows:

Product information

For documentation, release notes, software updates, or information about Dell EMC products, go to Dell EMC Online Support at https://www.dell.com/support.

Technical support

Go to Dell EMC Online Support and click Support. You will see several options for contacting Dell EMC Technical Support. Note that to open a service request, you must have a valid support agreement. Contact your Dell EMC sales representative for details about obtaining a valid support agreement or with questions about your account.

Online communities

Visit Dell EMC Community Network (DECN) at https://www.dell.com/community/Dell-Community/ct-p/English for peer contacts, conversations, and content on product support and solutions. Interactively engage online with customers, partners, and certified professionals for all Dell EMC products.

Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of this document to vplex.doc.feedback@dell.com.

Using the VPlexcli

Topics:

Logging into the CLI

The metro node command line interface supports all metro node operations. You can access the CLI in the metro node clusters. Use an SSH client, such as PuTTY and OpenSSH, to log in to the interface.

Prerequisites

Before logging in to the CLI, configure the SSH client as follows:
- Port: 22
- SSH protocol version: 2
- Scrollback lines: 2000000

Steps

1. Using an SSH client, connect to the metro node management module in the cluster that you want to log in to. Use the following information to connect to the module:
   The following prompt appears:

   ```
   Login as:
   ```

2. Type **service** to log in as the service user and press ENTER.
   The following prompt appears:

   ```
   Using keyboard-interactive authentication.
   Password:
   ```

3. Type the service password and press ENTER.

   The following prompt appears:

   ```
   service@director-1-1-a:~>
   ```

4. Type **vplexcli** and press ENTER.

   The following prompt appears:

   ```
   VPlexcli:
   ```

Results

You are now logged into the VPlexcli.

Password Policies

The management server uses a Pluggable Authentication Module (PAM) infrastructure to enforce minimum password quality.

For more information about technology used for password protection, see the *Security Configuration Guide for the metro node appliance.*

Note the following:

- Password policies do not apply to users configured using the LDAP server.
- The Password inactive days policy does not apply to the admin account to protect the admin user from account lockouts.
- During the metro node software upgrade, an existing user's password is not changed. Only the user's password age information changes.
- You must be an admin user to configure a password policy.

The following table lists and describes the password policies and the default values.

Table 2. Default password policies

Policy name	Description	Default value
Minimum password length	The minimum number of characters used when creating or changing a password. The minimum number of characters includes numbers, upper-case and lower-case letters, and special characters.	8
Minimum password age	The minimum number of days a password can be changed after the last password change.	1 (0 for service account)
Maximum password age	The maximum number of days that a password can be used since the last password change. After the maximum number of days, the account is locked and the user must contact the admin user to reset the password.	90 (3650 days for service account)
Password expiry warning	The number of days before the password expires. A warning message indicating that the password must be changed is displayed.	15 (30 days for service password)
Password inactive days	The number of days after a password has expired before the account is locked.	1

The password policy for existing admin, service, and customer-created user accounts is updated automatically as part of the upgrade to this release. See the *Security Configuration Guide for the metro node appliance* for information about account passwords.

Valid Password Characters

The following characters are allowed in a VPlexcli password:

- A-Z
- a - z
- 0 - 9
- . ? / * @ ^ % # + = - _ ~ : space

(i) **NOTE:** A space is allowed only between the characters in a password, not in the beginning or the end of the password.

(i) **NOTE:** A password can not begin with a pound sign (#).

Logging out from the CLI

Use the exit command to exit the command line interface from any context.

About this task

For example:

```
VPlexcli:/clusters> exit
Connection closed by foreign host.
```

CLI context tree

The CLI is divided into command contexts. Some commands are accessible from all contexts, and are referred to as *global commands*.

The remaining commands are arranged in a hierarchical context tree. These commands can only be executed from the appropriate location in the context tree.

Understanding the command context tree is critical to using the command line interface effectively.

The root context contains these sub-contexts:

- `clusters-witness/` - Manage Cluster Witness options. If the Cluster Witness optional component is installed, then the cluster-witness context is available.
- `clusters/` - Create and manage links between clusters, devices, directors, extents, system volumes, and virtual volumes. Configure connectivity, register initiator ports, export target ports, and storage views.
- `connectivity/` - Configure connectivity between back-end storage arrays, front-end hosts, local directors, port-groups and inter-cluster WANs.
- `data-migrations/` - Create, verify, start, pause, cancel, and resume data migrations of extents or devices.
- `distributed-storage/` - Create and manage distributed devices and rule sets.
- `monitoring/` - Create and manage performance monitors.
- `notifications/` - Create and manage call-home events.
- `system-defaults/` - Display systems default settings.

Except for `system-defaults/`, each of the sub-contexts contains one or more sub-contexts to configure, manage, and display sub-components.

Command contexts have commands that can be executed only from that context. The command contexts are arranged in a hierarchical context tree. The topmost context is the root context, or "/".

Context tree searching

Search the context tree for context names and data matching specific patterns.

Using the Find command to search the context tree

Use this command to find all contexts matching a pattern. When invoked interactively, the command prints the contexts to the screen.

Patterns can be either literal character strings or strings that include wildcard characters. For a complete list of supported CLI wildcard characters, see the topic "Wildcards" in the *CLI Reference Guide*.

Navigate the CLI context tree

Use the `cd` command to navigate between command contexts.

The current context is always displayed at the command line interface prompt:

```
VPlexcli:/> cd /clusters/cluster-1/devices/
VPlexcli:/clusters/cluster-1/devices>
```

For example, to navigate from the root (`/`) context to the `connectivity` context to view member ports for a specified FC port group:

```
VPlexcli:/>ll /clusters/cluster-1/directors/director-1-1-*/ports

/clusters/cluster-1/directors/director-1-1-A/ports:
Name    Address              Role        Status  RxPower[uW]  TxPower[uW]  Temp[C]  Speed
   Topology
-----   ------------------   ---------   ------  -----------  -----------  -------
---------  --------
IO-00   0xc001445a80320000   front-end   up      469          717          44
16Gbits/s  p2p
IO-01   0xc001445a80320100   front-end   up      443          699          43
16Gbits/s  p2p
IO-02   0xc001445a80320800   back-end    up      548          784          44
8Gbits/s   p2p
IO-03   0xc001445a80320900   back-end    up      512          634          44
16Gbits/s  p2p
LC-00   128.221.250.35       local-com   up      -            -            -        10000
   -
LC-01   128.221.251.35       local-com   up      -            -            -        10000
   -
WC-00   192.168.38.35        wan-com     up      514          602          43       10000
   -
WC-01   192.168.39.35        wan-com     up      545          587          42       10000
   -


/clusters/cluster-1/directors/director-1-1-B/ports:
Name    Address              Role        Status  RxPower[uW]  TxPower[uW]  Temp[C]  Speed
   Topology
-----   ------------------   ---------   ------  -----------  -----------  -------
---------  --------
IO-00   0xc001445a80330000   front-end   up      197          667          44
16Gbits/s  p2p
IO-01   0xc001445a80330100   front-end   up      368          815          44
16Gbits/s  p2p
IO-02   0xc001445a80330800   back-end    up      557          777          43
16Gbits/s  p2p
IO-03   0xc001445a80330900   back-end    up      521          824          43
16Gbits/s  p2p
LC-00   128.221.250.36       local-com   up      -            -            -        10000
   -
LC-01   128.221.251.36       local-com   up      -            -            -        10000
   -
WC-00   192.168.38.36        wan-com     up      520          592          43       10000
   -
WC-01   192.168.39.36        wan-com     up      577          599          43       10000
   -
```

Use the `cd` command with no arguments or followed by a space and three periods (`cd ...`) to return to the root context.

Use the cd command followed by a space and two periods (`cd ..`) to return to the context immediately above the current context:

```
VPlexcli:/monitoring/directors/director-1-1-B> cd ..
VPlexcli:/monitoring/directors>
```

To navigate directly to a context from any other context use the `cd` command and specify the absolute context path.

pushd and popd commands

- Use the `pushd` *directory* command to save the current directory, and jump to the specified directory.

  Once a directory is added to the pushd stack, use the `pushd` command with no argument to switch back to the previous directory.

  In the following example, `pushd` switches between the clusters and monitoring parent contexts:

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> pushd /monitoring/directors/
director-1-1-A
[/monitoring/directors/director-1-1-A, /clusters/cluster-1/directors/director-1-1-A, /
monitoring/directors/director-1-1-A]
VPlexcli:/monitoring/directors/director-1-1-A> pushd
[/clusters/cluster-1/directors/director-1-1-A, /monitoring/directors/director-1-1-A, /
monitoring/directors/director-1-1-A]
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> pushd
[/monitoring/directors/director-1-1-A, /clusters/cluster-1/directors/director-1-1-A, /
monitoring/directors/director-1-1-A]
VPlexcli:/monitoring/directors/director-1-1-A>
```

- Use the `dirs` command to display to the current context stack:

```
VPlexcli:/clusters/cluster-1> dirs
[/clusters/cluster-1, /, /, /clusters/cluster-1/directors/director-1-1-A/hardware/
ports/A5-GE01, /]
```

- Use the `popd` command to remove the last directory saved by the `pushd` command and jump to the new top directory.

  In the following example, the `dirs` command displays the context stack saved by the `pushd` command, and the `popd` command removes the top directory, and jumps to the new top directory:

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> dirs
[/clusters/cluster-1/directors/director-1-1-A, /monitoring/directors/director-1-1-A]
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> popd
[/clusters/cluster-1/directors/director-1-1-A]
VPlexcli:/monitoring/directors/director-1-1-A>
```

Where am I in the context tree?

The CLI includes several features to help locate your current position in the context tree and determine what contexts and/or commands are accessible.

(i) **NOTE:** The context tree displays only those objects associated with directors to which the management system is connected.

- The command prompt displays the current context:

```
VPlexcli:/> cd /monitoring/directors/director-1-1-B/monitors/
VPlexcli:/monitoring/directors/director-1-1-B/monitors>
```

- The `ls` command displays the sub-contexts immediately accessible from the current context:

```
VPlexcli:/> ls
clusters  data-migrations  distributed-storage  monitoring  notifications  system-
defaults
```

- The `ls -l` command displays more information about the current sub-contexts:

```
VPlexcli:/data-migrations> ls -l
Name              Description
----------------  ------------------------------------
device-migrations  Contains all the device migrations in the system.
extent-migrations  Contains all the extent migrations in the system.
```

- For contexts where the next lowest level is a list of individual objects, the `ls` command displays a list of the objects:

```
VPlexcli:/clusters/cluster-1/exports/ports> ls
P000000003B2017DF-A0-FC00  P000000003B2017DF-A0-FC01
```

```
P000000003B2017DF-A0-FC02   P000000003B2017DF-A0-FC03
P000000003B3017DF-B0-FC00   P000000003B3017DF-B0-FC01
P000000003B3017DF-B0-FC02   P000000003B3017DF-B0-FC03


VPlexcli:/clusters/cluster-1/exports/ports> ls
P000000000482F211-ETH06   P000000000482F211-ETH07
P000000000482F221-ETH06   P000000000482F221-ETH07
P000000000492F211-ETH06   P000000000492F211-ETH07
P000000000492F221-ETH06   P000000000492F221-ETH07
```

- The cd command followed by a <Tab> displays the same information as ls at the context level.

  For example, type cd and press <Tab> in the data-migrations context to display available options:

```
VPlexcli:/data-migrations> cd <Tab>
device-migrations/    extent-migrations/
```

- The tree command displays the immediate sub-contexts in the tree using the current context as the root:

```
VPlexcli:/ cd /clusters/cluster-1/devices/Symm_rC_3
VPlexcli:/clusters/cluster-1/devices/Symm_rC_3> tree
/clusters/cluster-1/devices/Symm_rC_3:
   components
     Symm_rC_3_extent_0
     Symm_rC_3_extent_1
vsphere-ds-1416311053-1_vol
```

- The tree -e command displays immediate sub-contexts in the tree and any sub-contexts under them:

```
VPlexcli:/clusters/cluster-1/devices/Symm_rC_3> tree -e
/clusters/cluster-1/devices/Symm_rC_3:
   components
     Symm_rC_3_extent_0
       components
         Symm0487_44C
           components
     Symm_rC_3_extent_1
       components
         Symm0487_44B
           components
```

(i) **NOTE:** For contexts where the next level down the tree is a list of objects, the tree command displays the list. This output can be very long. For example:

```
VPlexcli:/clusters/cluster-1> tree
/clusters/cluster-1:
   cluster-connectivity
     cluster-links
       to-cluster-2
     proxy-servers
     static-routes
   devices
     base0
       components
         extent_CX4_lun0_1
           components
             CX4_lun0
               components
  .
  .
  .
 exports
     initiator-ports
       LicoJ006_hba0
       LicoJ006_hba1
  .
  .
  .
 ports
       P000000003CA00147-A0-FC00
       P000000003CA00147-A0-FC01
```

```
.
.
.
storage-views
        LicoJ009
        LicoJ013
    storage-elements
      extents
        extent_CX4_Logging_1
```

Using CLI commands

The commands that make up the CLI fall into two groups:

- Global commands that can be used in any context. For example: cd, date, ls, exit, and user.
- Context-specific commands that can be used only in specific contexts. For example, to use the copy command, the context must be /distributed-storage/rule-sets.

Use the help command to display a list of all commands (including the global commands) available from the current context.

Use the help -G command to display a list of available commands in the current context excluding the global commands. Some contexts "inherit" commands from their parent context. These commands can be used in both the current context and the context immediately above in the tree:

```
VPlexcli:/distributed-storage/bindings> help -G
Commands inherited from parent contexts:
dd   rule   rule-set   summary
```

Some commands are loosely grouped by function. For example, the commands to create and manage performance monitors start with the word "monitor".

Use the <Tab> key display the commands within a command group. For example, to display the commands that start with the word "monitor", type "monitor" followed by the <Tab> key:

```
VPlexcli:/> monitor <Tab>
add-console-sink   add-file-sink      collect            create             destroy
      remove-sink
stat-list
```

Page output

For large configurations, output from some commands can reach hundreds of lines.

Paging displays long output generated by the ll and ls commands one page at a time:

To enable paging, add -p at the end of any command:

```
VPlexcli:/clusters/cluster-1/storage-elements>  ls storage-volumes -p
```

One page of output is displayed. The following message is at the bottom of the first page:

```
-- more --(TOP )- [h]elp
```

Press the spacebar to display the next page.

The message now indicates what percentage of the output has been displayed:

```
-- more --( 24%)- [h]elp
```

h - Displays instructions on how to move and search the output.

q - Exits paging mode.

Tab completion

Use the Tab key to:
- vplex_c_display_valid_contexts_and_commands
- vplex_c_display_command_arguments

Display valid contexts and commands

Press Tab after typing a partial context path to display a list of valid commands or contexts for the current context:

About this task

```
VPlexcli:/> cd /clusters/cluster-1/ <Tab>
connectivity/                          consistency-groups/
devices/                               exports/
performance-policies/                  storage-elements/
system-volumes/
virtual-volumes/

VPlexcli:/> cd /clusters/cluster-1/
```

Display command arguments

Press Tab after typing a command name to display the command's arguments. For example:

```
VPlexcli:/> monitor <Tab>
add-console-sink     add-file-sink     collect
create               destroy           remove-sink stat-list
```

Wildcards

The command line interface includes 3 wildcards:
- `*` - matches any number of characters.
- `?` - matches any single character.
- `~` - matches any number of characters.
- `[a|b|c]` - matches any of the single characters a or b or c.

(i) **NOTE:** Use the `find` command with wildcards to find context names and data matching specific patterns in the CLI context tree. See Context Tree Searching for more information.

* wildcard

Use the * wildcard to apply a single command to multiple objects of the same type (directors or ports).

For example, to display the status of ports on each director in a cluster, without using wildcards:

```
ll clusters/cluster-1/directors/director-1-1-A/ports

ll clusters/cluster-1/directors/director-1-1-B/ports

.

.
```

Alternatively:
- Use one * wildcard to specify all engines, and

- Use a second * wildcard specify all directors:

```
ll clusters/cluster-*/directors/director-1-1-*/ports/
```

** wildcard

Use the ** wildcard to match all contexts and entities between two specified objects.

For example, to display all director ports without using wildcards:

```
ll clusters/cluster-1/directors/director-1-1-A/ports

ll clusters/cluster-1/directors/director-1-1-B/ports

.

.
```

Alternatively, use a ** wildcard to specify all contexts and entities between /engines and ports:

```
ll clusters/**/ports/
```

? wildcard

Use the ? wildcard to match a single character (number or letter).

```
ls /storage-elements/extents/0x1?[8|9]
```

Returns information on multiple extents.

~ wildcard

Use ~ to match any number of characters before object.

Example:

```
VPlexcli:/> ll ~directors/*/ports

/clusters/cluster-1/directors/director-1-1-A/ports:
Name Address Role Status RxPower[uW] TxPower[uW] Temp[C] Speed Topology
----- ----------------- --------- ------ ----------- ----------- ------- --------- --------
IO-00 0xc001445a80320000 front-end up 472 726 44 16Gbits/s p2p
IO-01 0xc001445a80320100 front-end up 441 708 42 16Gbits/s p2p
IO-02 0xc001445a80320800 back-end up 545 785 44 8Gbits/s p2p
IO-03 0xc001445a80320900 back-end up 512 641 43 16Gbits/s p2p
LC-00 128.221.250.35 local-com up - - - 10000 -
LC-01 128.221.251.35 local-com up - - - 10000 -
WC-00 192.168.38.35 wan-com up 510 602 43 10000 -
WC-01 192.168.39.35 wan-com up 530 588 42 10000 -


/clusters/cluster-1/directors/director-1-1-B/ports:
Name Address Role Status RxPower[uW] TxPower[uW] Temp[C] Speed Topology
----- ----------------- --------- ------ ----------- ----------- ------- --------- --------
IO-00 0xc001445a80330000 front-end up 188 661 43 16Gbits/s p2p
IO-01 0xc001445a80330100 front-end up 368 815 43 16Gbits/s p2p
IO-02 0xc001445a80330800 back-end up 567 796 43 16Gbits/s p2p
IO-03 0xc001445a80330900 back-end up 521 812 43 16Gbits/s p2p
LC-00 128.221.250.36 local-com up - - - 10000 -
LC-01 128.221.251.36 local-com up - - - 10000 -
WC-00 192.168.38.36 wan-com up 507 592 43 10000 -
WC-01 192.168.39.36 wan-com up 566 596 44 10000 -
```

```
/clusters/cluster-2/directors/director-2-1-A/ports:
Name Address Role Status RxPower[uW] TxPower[uW] Temp[C] Speed Topology
----- ------------------ --------- ------ ----------- ----------- ------- --------- --------
IO-00 0xc001445a80340000 front-end up 505 797 42 16Gbits/s p2p
IO-01 0xc001445a80340100 front-end up 551 727 41 16Gbits/s p2p
IO-02 0xc001445a80340800 back-end up 410 766 45 16Gbits/s p2p
IO-03 0xc001445a80340900 back-end up 462 682 44 16Gbits/s p2p
LC-00 128.221.250.67 local-com up - - - 10000 -
LC-01 128.221.251.67 local-com up - - - 10000 -
WC-00 192.168.38.67 wan-com up 557 598 43 10000 -
WC-01 192.168.39.67 wan-com up 463 597 42 10000 -


/clusters/cluster-2/directors/director-2-1-B/ports:
Name Address Role Status RxPower[uW] TxPower[uW] Temp[C] Speed Topology
----- ------------------ --------- ------ ----------- ----------- ------- --------- --------
IO-00 0xc001445a80350000 front-end up 463 800 43 16Gbits/s p2p
IO-01 0xc001445a80350100 front-end up 254 797 40 16Gbits/s p2p
IO-02 0xc001445a80350800 back-end up 506 703 41 16Gbits/s p2p
IO-03 0xc001445a80350900 back-end up 518 600 40 16Gbits/s p2p
LC-00 128.221.250.68 local-com up - - - 10000 -
LC-01 128.221.251.68 local-com up - - - 10000 -
WC-00 192.168.38.68 wan-com up 505 589 43 10000 -
WC-01 192.168.39.69 wan-com up 574 596 42 10000 -
```

[a|b|c] wildcard

Use the [a|b|c] wildcard to match one or more characters in the brackets.

```
ll clusters/cluster-1/directors/director-1-1-A/hardware/ports/A[0-1]
```

displays only ports with names starting with an A, and a second character of 0 or 1.

Names

Major components are named as follows:

Clusters   Metro node local configurations have a single cluster, with a cluster ID of cluster 1. Metro node metro configurations have two clusters with cluster IDs of 1 and 2.

```
VPlexcli:/clusters/cluster-1/
```

Directors   Directors are named director-*n-n-n* where the first value is the cluster ID (1 or 2), the second value is always 1, and the third is A or B.

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A
```

For objects that can have user-defined names, those names must comply with the following rules:

● Can contain uppercase and lowercase letters, numbers, and underscores
● No spaces
● Cannot start with a number
● No more than 63 characters

Specifying addresses

Metro node uses IPv4 addressing. Many commands can be specified as IPv4 formats.

See the *Dell EMC Administration Guide for metro node* for usage rules and address formats.

Command globbing

Command globbing combines wildcards and context identifiers in a single command. Globbing can address multiple entities using a single command.

Example 1

To display the status of all the director ports on a large configuration using no wildcards, type:

```
VPlexcli:/> ll clusters/cluster-*/directors/director-1-1-*/ports/
```

for cluster and director.

Using the * wildcard reduces this task to a single command.

Using the ** wildcard simplifies the command even more:

```
ll /**/ports
```

Positional command arguments

Most commands require arguments.

Some command arguments are positional. That is, the argument can be typed without an identifier IF it is entered in the position specified by the command syntax.

For example, the alias command has two arguments in the following order (syntax):

```
alias
[-n|--name] alias_name
[-t|to] "string of commands in quotes"
```

Type the command with the arguments with identifiers in any order (not as specified by the syntax):

```
VPlexcli:/> alias --to "cd clusters" --name cdc
```

or,

Type the command with the arguments without identifiers in the order specified by the command syntax:

```
VPlexcli:/> alias cdc "cd clusters"
```

--verbose argument

The --verbose argument displays additional information for some commands. For example, without --verbose argument:

```
VPlexcli:/> connectivity validate-be
Summary
Cluster cluster-1
    This cluster has 0 storage-volumes which do not have dual paths
    This cluster has 0 storage-volumes which are not visible from all directors
```

With --verbose argument:

```
VPlexcli:/> connectivity validate-be --verbose
Storage volumes that are dead or unreachable:
Cluster     Dead or Unreachable Storage Volumes
---------   -------------------------------------
cluster-2   VPD83T3:6000453000000000080007f16e9512a2b1
cluster-1   VPD83T3:6000453000000000010007f16e9512a2a5
            VPD83T3:6000453000000000010007f16e9512a2a7
            VPD83T3:6000453000000000010007f16e9512a2a9
Summary
```

```
Cluster cluster-2
    This cluster has 1 storage-volumes which are dead or unreachable
    This cluster has 0 storage-volumes which do not have dual paths
    This cluster has 0 storage-volumes which are not visible from all directors
Cluster cluster-1
    This cluster has 3 storage-volumes which are dead or unreachable
    This cluster has 0 storage-volumes which do not have dual paths
    This cluster has 0 storage-volumes which are not visible from all directors
```

Search command history

- To display the last commands typed, press the up arrow key.
- To search for a command typed in the current CLI session, press Ctrl-r.

  The reverse search prompt is displayed:

  ```
  (reverse-i-search)'':
  ```

  Type the first letter of the command to search for. After you type the first letter, the search tool displays a list of possible matches.

View command history

Use the up arrow key to display the last command typed.

Use the up arrow key, multiple times to display recent command history.

Use the `history` command to display a complete list of commands executed in the current session:

```
VPlexcli:> history
0 extent unclaim *
1 ls
2 ls -l
3 extent claim *
4 ls
5 ls -l
6 ls -la
```

Use the `history` *nn* command to display the last *nn* entries in the list:

```
VPlexcli:/clusters/cluster-1> history 22
478 ls storage-volumes -p
479 cd clusters/cluster-1/
480 ls storage-volumes
481 cd storage-elements/
482  ls storage-volumes -p
```

Get help

- Use the `help` or `?` command with no arguments to display all the commands available in the current context, including global commands.
- Use the `help` or `?` command with `-G` argument to display all the commands available in the current context, excluding global commands:

  ```
  VPlexcli:/clusters> help -G
  Commands specific to this context and below:
  add configdump expel forget show-remote-devices shutdown summary unexpel
  ```

- Use the `help` command or *command* `--help` to display help for the specified command.

3

Commands

Topics:

- advadm dismantle
- alias
- array claim
- array forget
- array re-discover
- array used-by
- back-end degraded list
- back-end degraded recover
- batch-migrate cancel
- batch-migrate check-plan
- batch-migrate clean
- batch-migrate commit
- batch-migrate create-plan
- batch-migrate pause
- batch-migrate remove
- batch-migrate resume
- batch-migrate start
- batch-migrate summary
- capture begin
- capture end
- capture pause
- capture replay
- capture resume
- cd
- cluster add
- cluster configdump
- cluster expel
- cluster forget
- cluster show-remote-devices
- cluster shutdown
- cluster status
- cluster summary
- cluster unexpel
- collect-diagnostics
- configuration get-product-type
- configuration join-clusters
- configuration metadata-backup
- configuration show-meta-volume-candidates
- configuration upgrade-meta-slot-count
- connectivity director
- connectivity list all
- connectivity list directors
- connectivity list initiators
- connectivity list storage-volumes
- connectivity show
- connectivity validate-be
- connectivity validate-local-com

- ds rule-set what-if
- ds summary
- exec
- exit
- export initiator-port discovery
- export initiator-port register
- export initiator-port register-host
- export initiator-port show-logins
- export initiator-port unregister
- export port summary
- export storage-view addinitiatorport
- export storage-view addport
- export storage-view addvirtualvolume
- export storage-view checkconfig
- export storage-view create
- export storage-view destroy
- export storage-view find
- export storage-view find-unmapped-volumes
- export storage-view map
- export storage-view removeinitiatorport
- export storage-view removeport
- export storage-view removevirtualvolume
- export storage-view show-powerpath-interfaces
- export storage-view summary
- export target-port renamewwns
- extent create
- extent destroy
- extent summary
- find
- front-end-performance-stats start
- front-end-performance-stats status
- front-end-performance-stats stop
- getsysinfo
- health-check
- help
- history
- local-device create
- local-device destroy
- local-device summary
- log filter create
- log filter destroy
- log filter list
- log source create
- log source destroy
- log source list
- logging-volume add-mirror
- logging-volume create
- logging-volume detach-mirror
- logging-volume destroy
- logical-unit forget
- ls
- meta-volume attach-mirror
- meta-volume backup
- meta-volume create
- meta-volume destroy
- meta-volume detach-mirror

advadm dismantle

Dismantles storage objects down to the storage-volume level, and optionally unclaims the storage volumes.

Contexts

All contexts.

Syntax

```
advadm dismantle

[-r|--devices] context path,context path

[-v|--virtual-volumes] context path,context path

[--unclaim-storage-volumes] [-f|--force]
```

Arguments

Required arguments	
[-r|--devices] *context path,context path...*	One or more devices to dismantle. Entries must be separated by commas. You can use glob patterns.
[-v|--virtual-volumes] *context path,context path...*	One or more virtual volumes to dismantle. Entries must be separated by commas. You can use glob patterns.
Optional Arguments	
--unclaim-storage-volumes	Unclaim the storage volumes after the dismantle is completed.
[-f	--force]	Force the dismantle without asking for confirmation. Allows the command to be run from a non-interactive script.

Description

To dismantle a virtual volume, the specified volume must:

- Not be exported to a storage view.
- Not a member of a consistency group

virtual volume exported through a storage view or belonging to a consistency group are not eligible to be dismantled. The command skips any volumes that are not eligible for dismantle, prints a message listing skipped volumes, and dismantles those volumes that are eligible.

If the `--force` argument is used, no confirmation is displayed before the dismantle.

Examples

In the following example, the specified volume is dismantled:

```
VPlexcli:/clusters/cluster-1> advadm dismantle --verbose --virtual-volumes virtual-
volumes/test_r1_vol --force
destroyed virtual volume
    /clusters/cluster-1/virtual-volumes/test_r1_vol
destroyed
    /clusters/cluster-2/devices/test_r1
Destroyed 1 out of 1 targetted extents.
destroyed
    /clusters/cluster-1/storage-elements/extents/extent_CLAR0014_LUN14_1
```

In the following example, the specified volumes are NOT dismantled because they are exported or are members of a consistency group:

```
VPlexcli:/>advadm dismantle -v rC_extentSrc_C1_CHM_00*, axel_dr1_vol
The following virtual-volumes will not be dismantled because they are exported. Please
remove
them from the storage-views before dismantling them:
    /clusters/cluster-1/virtual-volumes/rC_extentSrc_C1_CHM_0002_vol is in
/clusters/cluster-1/exports/storage-views/chimera_setupTearDown_C1
    /clusters/cluster-1/virtual-volumes/rC_extentSrc_C1_CHM_0001_vol is in
/clusters/cluster-1/exports/storage-views/chimera_setupTearDown_C1
.
.
.
The following virtual-volumes will not be dismantled because they are in consistency-
groups.
Please remove them from the consistency-groups before dismantling them:
    /clusters/cluster-2/virtual-volumes/axel_dr1_vol is in
/clusters/cluster-2/consistency-groups/async_sC12_vC12_nAW_CHM

No virtual-volumes to dismantle.
```

See also

- ds dd create
- iscsi sendtargets add
- virtual-volume create

alias

Creates a command alias.

Contexts

All contexts.

Syntax

alias

[-n|--name] *name*

[-t|--to] "*commands and arguments* "

Arguments

Required arguments	
`[-n|--name]` *name*	* The name of the new alias. ● Up to 63 characters. ● May contain letters, numbers, and underscores '_'. s ● Cannot start with a number.
`[-t|--to]` *"commands and arguments"*	* A string of commands and arguments enclosed in quotation marks. This string is invoked when the aliased command is used.

* - argument is positional.

Description

Aliases are shortcuts for frequently used commands or commands that require long strings of context identifiers.

Use the alias command with no arguments to display a list of all aliases configured on the system.

Use the `alias name` command to display the underlying string of the specified alias.

Use the `alias` *name "string of CLI commands"* command to create an alias with the specified name that invokes the specified string of commands.

Use the `unalias` command to delete an alias.

● ? Substitutes for the `help` command.
● ll Substitutes for the `ls -a` command.
● `quit` Substitutes for the `exit` command.

An `alias` that executes correctly in one context may conflict with an existing command when executed from another context (pre-existing commands are executed before aliases if the syntax is identical).

The following aliases are pre-configured:

1. Local command in the current context.
2. Global command in the current context.
3. Root context is searched for a match.

An `alias` set at the command line does not persist when the user interface is restarted. To create an `alias` command that persists, add it to the `/var/log/VPlex/cli/VPlexcli-init` file.

Make sure that the alias *name* is unique, that is, not identical to an existing command or alias.

Examples

Create an alias:

```
VPlexcli:/> alias mon-Dir-1-1-B "cd /monitoring/directors/director-1-1-B"
```

Display a list of aliases:

```
VPlexcli:/> alias
Name             Description
---------------  -------------------------------------------------------
?                Substitutes the 'help' command.
mon-Dir-1-1-B    Substitutes the 'cd /monitoring/directors/director-1-1-B'
ll               Substitutes the 'ls -al' command.
quit             Substitutes the 'exit' command.
```

Display a specified alias:

```
VPlexcli:/> alias mon-Dir-1-1-B
Name             Description
```

```
--------------    ------------------------------------------------------------
mon-Dir-1-1-B     Substitutes the 'cd /monitoring/directors/director-1-1-B' command.
```

Use an alias:

```
VPlexcli:/> mon-Dir-1-1-B
VPlexcli:/monitoring/directors/director-1-1-B>
```

See also

- `ls`
- `unalias`

array claim

Claims and names unclaimed storage volumes for a given array.

Contexts

All contexts.

Syntax

```
array claim
[-s|--storage-array] context-path
[-m|--mapping-file] mapping file
[-t|--tier]
[-l|--claim]
[--force]
```

Arguments

Required arguments	
`[-s|--storage-array]` *context-path*	* Context path of the storage-array on which to claim storage volumes.
Optional arguments	
`[-m|--mapping-file]` *mapping file*	Location of the name mapping file.
`[-t|--tier]` *mapping file*	Add a tier identifier to the storage volumes to be claimed.
`[-l|--claim]`	Try to claim unclaimed storage-volumes.
`[--force]`	Force the operation without confirmation. Allows the command to be run from a non-interactive script.

* - argument is positional.

Description

Claims and names unclaimed storage volumes for a given array.

Some storage arrays support auto-naming (Dell EMC Symmetrix/VMAX, CLARiiON/VNX, XtremIO, Hitachi AMS 1000, HDS 9970/9980, and USP VM) and do not require a mapping file.

Other storage arrays require a hints file generated by the storage administrator using the array's command line. The hints file contains the device names and their World Wide Names.

Use the `--mapping-file` argument to specify a hints file to use for naming claimed storage volumes. File names will be used to determine the array name.

Use the `--tier` argument to add a storage tier identifier in the storage-volume names.

This command can fail if there is not a sufficient number of meta-volume slots. See the troubleshooting section of the metro node procedures in the SolVe Desktop for a resolution to this problem.

See also

- `storage-volume find-array`

array forget

Removes a storage-array that is being retired from metro node.

Context

All contexts.

Syntax

```
array forget [-h|--help]
[--verbose]
[-r|--retire-logical-units]
[-a|--array]array
```

Arguments

Optional arguments	
`-h	--help`	Displays the usage for this command.
`--verbose`	Provides more output during command execution. This might not have any effect for some commands.
`-r	--retire-logical-units`	Retires all logical units before retiring the array. If not specified, the command fails if there are still logical units from the array in the logical-units context on metro node.
Required arguments	
`-a	--array=` *array*	Specifies the context path of the storage-array to forget.

* - argument is positional

array re-discover

Re-discovers an array, and makes the array's storage volumes visible to the metro node.

Contexts

Cluster-specific context and lower.

Syntax

```
array re-discover
[-a|--array]context-path
```

`[-c|--cluster]` *cluster-id*

`[-d|--hard]`

`[-f|--force]`

Arguments

Required arguments	
`[-a|--array]` *context-path*	* Context path that specifies the storage-array to re-discover.
`[-c|--cluster]` *cluster-id*	Cluster ID of the target cluster.
Optional arguments	
`[-d|--hard]`	- Perform a hard rediscover. This is a disruptive operation because ITLs are destroyed and full discoveries executed. I/O temporarily stops until the array responds with data for each LUN. Discovery time correlates to array response time, number of provisioned volumes, and number of paths per volume. Large numbers of volumes result in longer discovery times. - Metro node automatically verifies the volume ID (VPD ID) on existing provisioned volumes to detect if the array's device/LUN mapping has changed. *LUN swapping: Logical-unit swapping occurs when the array's back-end device/LUN mapping has changed. This can be detected by comparing the system's saved copy of the volume's ID (VPD_ID) with value returned by INQ VPD83 to its LUN. - For example: A LUN is removed from a storage group on an array and then re-added. The LUN may now be mapped to a different device which reports a different VPD_ID value. Data corruption could occur if writes are sent to old VPD_ID value. - If logical-unit swapping has occurred use the `--hard` option to force fresh discovery of all ITLs on the array. (i) **NOTE:** using the `--hard` option is disruptive and can result in data unavailability and/or data loss on live exported paths.
`[-f|--force]`	Force the operation without confirmation. Allows the command to be run from a non-interactive script.

* - argument is positional.

Description

Manually synchronizes the export state of the target device. Used in two scenarios:
- When the exported LUNs from the target array to metro node are modified.

Newer protocol-compliant SCSI devices return a notification code when the exported set changes, and may not require manual synchronization. Older devices that do not return a notification, must be manually synchronized.

- When the array is not experiencing I/O (the transport interface is idle), there is no mechanism by which to collect the notification code. In this scenario, do one of the following:
  - Wait until I/O is attempted on any of the LUNs,
  - Disruptively disconnect and reconnect the array, or
  - Use the `array rediscover` command.

  ⚠ **CAUTION: This command cannot detect LUN-swapping conditions on the arrays being re-discovered. On older configurations, this might disrupt I/O on more than the given array.**

Use the `ll /clusters/*/storage-elements/storage-arrays/` command to display the names of storage arrays.

Examples

In the following example:

- The `ll /clusters/*/storage-elements/storage-arrays/` command displays the names of storage arrays.
- The `array re-discover` command re-discovers a specified array:

```
VPlexcli:/> ll /clusters/*/storage-elements/storage-arrays/

/clusters/cluster-1/storage-elements/storage-arrays:
Name                              ID                    Connectivity  Auto    Ports                 Logical
                                                        Status        Switch                        Unit
--------------------------------  --------------------  ------------  ------  --------------------  Count
--------------------------------  --------------------  ------------  ------  --------------------  ------
--------------------------------  --------------------  ------------  ------  --------------------
EMC-0x00000000192601378           0x00000000192601378   ok            -       0x5000097208158918,   1
                                                                              0x500009720815891d,
                                                                              0x5000097208158920,
                                                                              0x5000097208158925,
                                                                              0x5000097208158958,
.
.
.
                                                                                                    VPXX-0047
```

```
VPlexcli:/clusters> ll /clusters/*/storage-elements/storage-arrays/

/clusters/cluster-1/storage-elements/storage-arrays:
Name                         Connectivity  Auto    Ports                                              Logical
                             Status        Switch  -----------------------------------------------    Unit
--------------------------   ------------  ------  -----------------------------------------------    Count
--------------------------   ------------  ------  -----------------------------------------------    ------
EMC-CLARiiON-APM00111701776  ok            true    iqn.1992-04.com.emc:cx.apm00111701776.a10,0x5,     40
                                                   iqn.1992-04.com.emc:cx.apm00111701776.a10,0x7,
                                                   iqn.1992-04.com.emc:cx.apm00111701776.b10,0x6,
                                                   iqn.1992-04.com.emc:cx.apm00111701776.b10,0xa
EMC-CLARiiON-APM00113500683  ok            true    iqn.1992-04.com.emc:cx.apm00113500683.a8,0x3,      38
                                                   iqn.1992-04.com.emc:cx.apm00113500683.a8,0x4,
                                                   iqn.1992-04.com.emc:cx.apm00113500683.b8,0x7,
                                                   iqn.1992-04.com.emc:cx.apm00113500683.b8,0x8


/clusters/cluster-2/storage-elements/storage-arrays:
Name                         Connectivity  Auto    Ports                                              Logical
                             Status        Switch  -----------------------------------------------    Unit
--------------------------   ------------  ------  -----------------------------------------------    Count
--------------------------   ------------  ------  -----------------------------------------------    ------
EMC-CLARiiON-APM00111701776  ok            true    iqn.1992-04.com.emc:cx.apm00111701776.a10,0x8,     40
                                                   iqn.1992-04.com.emc:cx.apm00111701776.a10,0x9,
                                                   iqn.1992-04.com.emc:cx.apm00111701776.b10,0xb,
                                                   iqn.1992-04.com.emc:cx.apm00111701776.b10,0xc
EMC-CLARiiON-APM00113500683  ok            true    iqn.1992-04.com.emc:cx.apm00113500683.a8,0x5,      38
                                                   iqn.1992-04.com.emc:cx.apm00113500683.a8,0x6,
                                                   iqn.1992-04.com.emc:cx.apm00113500683.b8,0x9,
                                                   iqn.1992-04.com.emc:cx.apm00113500683.b8,0xa


VPlexcli:/clusters>


                                                                                                    VPVE-0029
```

from the root context:

```
VPlexcli:/> array re-discover /clusters/cluster-1/storage-elements/storage-arrays/
EMC-0x00000000192601378 --cluster cluster-1 --force
```

from the clusters/cluster context:

```
VPlexcli:/> cd /clusters/cluster-1
VPlexcli:/clusters/cluster-1> array re-discover storage-elements/storage-arrays/
EMC-0x00000000192601378 --force
```

from the individual storage array context:

```
VPlexcli:/> cd /clusters/cluster-1/storage-elements/storage-arrays/
VPlexcli:/clusters/cluster-1/storage-elements/storage-arrays/EMC-0x00000000192601378>
array re-discover --force
```

See also

● `storage-volume find-array`

array used-by

Displays the components that use a specified storage-array.

Contexts

All contexts.

Syntax

```
array used-by
[-a|--array] context-path
```

Arguments

`[-a|--array]` *context-path*	* Specifies the storage-array for which to find users. This argument is not required if the context is the target array.

* - argument is positional.

Description

Displays the components (storage-volumes) that use the specified storage array.

Examples

Display the usage of components in an array from the target storage array context:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-arrays/DellEMC-PowerStore-JJ30643>
array used-by
 Used-by details for storage-array DellEMC-PowerStore-JJ30643:
/clusters/cluster-1/storage-elements/extents/extent_6006016061211100363da903017ae011_1:
  SV1
```

```
/clusters/cluster-1/devices/dev_clus1:
   extent_SV1_1
      SV1
/clusters/cluster-1/system-volumes/log1_vol:
   extent_SV1_2
      SV1
/clusters/cluster-1/devices/clus1_device1:
   extent_SV1_3
      SV1
/clusters/cluster-1/devices/clus1_dev2:
   extent_SV1_4
      SV1
/clusters/cluster-1/devices/device_6006016061211100d42febba1bade011_1:
   extent_6006016061211100d42febba1bade011_1
      VPD83T3:6006016061211100d42febba1bade011
/distributed-storage/distributed-devices/dev1_source:
   dev1_source2012Feb16_191413
      extent_sv1_1
        sv1
/clusters/cluster-1/system-volumes/MetaVol:
   VPD83T3:6006016022131300de76a5cec256df11
/clusters/cluster-1/system-volumes/MetaVol:
   VPD83T3:60060160612111100014da56b3b277e011
/clusters/cluster-1/system-volumes/MetaVol_backup_2012Feb13_071901:
   VPD83T3:6006016061211100c4a223611bade011
 Summary:
         Count of storage-volumes that are not in use: 0
         Count of storage-volumes that are in use: 6
```

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-arrays/DellEMC-PowerStore-JJ30643>
array used-by
 Used-by details for storage-array DellEMC-PowerStore-JJ30643:
/clusters/cluster-1/storage-elements/extents/extent_6006016061211100363da903017ae011_1:
   SV1
/clusters/cluster-1/devices/dev_clus1:
   extent_SV1_1
      SV1
/clusters/cluster-1/system-volumes/log1_vol:
   extent_SV1_2
      SV1
/clusters/cluster-1/devices/clus1_device1:
   extent_SV1_3
      SV1
/clusters/cluster-1/devices/clus1_dev2:
   extent_SV1_4
      SV1
/clusters/cluster-1/devices/device_6006016061211100d42febba1bade011_1:
   extent_6006016061211100d42febba1bade011_1
      VPD83T3:6006016061211100d42febba1bade011
/distributed-storage/distributed-devices/dev1_source:
   dev1_source2012Feb16_191413
      extent_sv1_1
        sv1
/clusters/cluster-1/system-volumes/MetaVol:
   VPD83T3:6006016022131300de76a5cec256df11
/clusters/cluster-1/system-volumes/MetaVol:
   VPD83T3:60060160612111100014da56b3b277e011
/clusters/cluster-1/system-volumes/MetaVol_backup_2012Feb13_071901:
   VPD83T3:6006016061211100c4a223611bade011
 Summary:
         Count of storage-volumes that are not in use: 0
```

Display the usage of components in an array from the /storage-arrays context:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-arrays> array used-by --array
DellEMC-PowerStore-JJ30643
 Used-by details for storage-array DellEMC-PowerStore-JJ30643:
```

```
/clusters/cluster-1/storage-elements/extents/extent_6006016061211100363da903017ae011_1:
  SV1
```

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-arrays> array used-by --array
DellEMC-PowerStore-JJ30643
 Used-by details for storage-array DellEMC-PowerStore-JJ30643:
/clusters/cluster-1/storage-elements/storage-arrays> array used-by --array E
```

See also

- `storage-volume find-array`
- `storage-volume summary`

back-end degraded list

Displays a list of currently degraded I-Ts.

Contexts

All contexts.

Syntax

```
back-end degraded list
[-h|--help]
[--verbose]
[-g|--group-by= <group_by>]
```

Arguments

Optional arguments	
`[-h|--help]`	Display the usage for this command.
`[--verbose]`	Provides more output during command execution.
`[-g|--group-by= <group_by>]`	Group degraded I-Ts by the specified field. Supported fields: array, director.

Description

Lists I-Ts that have degraded performance, and I-Ts that have been isolated manually or isolated due to unstable performance.

Examples

List all degraded I-Ts grouped by director.

```
VPlexcli:/> back-end degraded
list

Degraded I-Ts:

Director        Director Port Initiator        Target
Array                         Degradation Reason
```

```
-------------- ------------- ------------------ ------------------
------------------------- -----------------
director-1-1-A A1-FC00       0xc00144878bda0800 0x5000144260321e00 EMC-Invista-rc-
surry-1      Manually isolated
              A1-FC01       0xc00144878bda0900 0x5006016547e01af9 EMC-CLARiiON-
APM00164919257 Manually isolated
director-1-1-B B1-FC01       0xc00144878bda8900 0x5006016547e01af9 EMC-CLARiiON-
APM00164919257 Manually isolated
```

List all degraded I-Ts grouped by array

```
VPlexcli:/> back-end degraded list --group-by
array

Degraded I-Ts:

Array                     Director      Director Port Initiator
Target              Degradation Reason
------------------------- ------------- ------------- ------------------
----------------- ------------------
EMC-CLARiiON-APM00164919257 director-1-1-A A1-FC01       0xc00144878bda0900
0x5006016547e01af9 Manually isolated
                            director-1-1-B B1-FC01       0xc00144878bda8900
0x5006016547e01af9 Manually isolated
EMC-Invista-rc-surry-1     director-1-1-A A1-FC00       0xc00144878bda0800
0x5000144260321e00 Manually isolated
```

See also

```
back-end degraded recover
```

back-end degraded recover

Recovers the specified degraded I-Ts.

Contexts

All contexts.

Syntax

```
back-end degraded recover
[-h|--help]
[--verbose]
[-p|--paths= <paths>]
[--all]
```

Arguments

Optional arguments	
[-h|--help]	Display the usage for this command.
[--verbose]	Provides more output during command execution.
[-p|--paths= <paths>]	The degraded I-Ts to recover. Each I-T must be expressed as a pair in the form "(<initiator>,<target>)".

[--all]	Recover all currently degraded I-Ts.

Description

Assert that the specified I-Ts are healthy and move them out of their degraded state.

Examples

Recover a specific degraded I-T.

```
VPlexcli:/> back-end degraded recover -p (0xc00144878bda0900,0x5006016547e01af9)

Recovered I-Ts:

Director       Director Port Initiator          Target              Array
     Degradation Reason
-------------- ------------- ----------------- ------------------
-------------------------- ------------------
director-1-1-A A1-FC01       0xc00144878bda0900 0x5006016547e01af9 EMC-CLARiiON-
APM00164919257 Manually isolated
```

Recover all degraded I-Ts.

```
VPlexcli:/> back-end degraded recover --
all

Recovered I-Ts:

Director       Director Port Initiator          Target
Array                            Degradation Reason
-------------- ------------- ----------------- ------------------
-------------------------- ------------------
director-1-1-A A1-FC00       0xc00144878bda0800 0x5000144260321e00 EMC-Invista-rc-
surry-1        Manually isolated
director-1-1-B B1-FC01       0xc00144878bda8900 0x5006016547e01af9 EMC-CLARiiON-
APM00164919257 Manually isolated
```

See also

```
back-end degraded list
```

batch-migrate cancel

Cancels an active migration and returns the source volumes to their state before the migration.

Contexts

All contexts.

Syntax

```
batch-migrate cancel
[-f|--file] pathname
```

Arguments

Required arguments	
`[-f|--file]` *pathname*	Directory and filename of migration plan file. Relative paths can be used. If no directory is specified, the default directory is `/var/log/VPlex/cli` on the management server.

Description

Attempts to cancel every migration in the specified batch file. If the command encounters an error, the command prints a warning to the console and continues until every migration listed in the file has been processed.

ⓘ **NOTE:** In order to re-run a canceled migration plan, first run the `batch-migrate remove` command to remove the records of the migration.

Examples

The following shows an example of the `batch-migrate cancel` command used to cancel every migration in the migrate.txt file.

```
VPlexcli:/data-migrations/device-migrations>
batch-migrate cancel --file migrate.txt
```

See also

- `batch-migrate clean`
- `batch-migrate commit`
- `batch-migrate create-plan`
- `batch-migrate pause`
- `batch-migrate remove`
- `batch-migrate resume`
- `batch-migrate start`
- `batch-migrate summary`

batch-migrate check-plan

Checks a batch migration plan.

Contexts

All contexts.

Syntax

```
batch-migrate check-plan
[-f|--file] pathname
```

Arguments

Required arguments	

[-f|--file] *pathname*	Directory and filename of migration plan file. Relative paths can be used. If no directory is specified, the default directory is `/var/log/VPlex/cli` on the management server.

Description

Checks the following conditions:

- Block-size of source and target extents is equal (4 K bytes)
- Capacity of target extent is equal to, or larger than the source extent's capacity
- Device migrations:
  - Target device has no volumes on it
  - Source device has volumes on it
- Extent migrations:
  - Target extent is claimed and ready for use
  - Source extent is in use

Check all migration plans before beginning execution.

Examples

In the following example, a migration plan fails the check.

```
VPlexcli:/> batch-migrate check-plan --file MigDev-test.txt
Checking migration plan file /var/log/VPlex/cli/MigDev-test.txt.
Target device '/clusters/cluster-2/devices/dev1723_61C' has a volume.
Target device '/clusters/cluster-2/devices/dev1723_618' has a volume.
Plan-check failed, 2 problems.
```

In the following example, a migration plan passes the check.

```
VPlexcli:/> batch-migrate check-plan --file migrate.txt
Checking migration plan file /temp/migration_plans/migrate.txt.
Plan-check passed.
```

See also

- `batch-migrate cancel`
- `batch-migrate clean`
- `batch-migrate commit`
- `batch-migrate create-plan`
- `batch-migrate pause`
- `batch-migrate remove`
- `batch-migrate resume`
- `batch-migrate start`
- `batch-migrate summary`

batch-migrate clean

Cleans the specified batch migration and deletes the source devices.

Contexts

All contexts.

Syntax

```
batch-migrate clean
[-f|--file] pathname
[-e|--rename-targets]
```

Arguments

Required arguments	
`[-f|--file]` *pathname*	*Directory and filename of migration plan file. relative paths can be used. If no directory is specified, the default directory is `/var/log/VPlex/cli` on the management server.
Optional arguments	
`[-e|--rename-targets]`	rename the target devices and virtual volumes to the source device names.

* argument is positional.

Description

Dismantles the source device down to its storage volumes and unclaims the storage volumes.

- For device migrations, cleaning dismantles the source device down to its storage volumes. The storage volumes no longer in use are unclaimed.

  For device migrations only, use the optional `--rename-targets` argument to rename the target device after the source device. If the target device is renamed, the virtual volume on top of it is also renamed if the virtual volume has a system-assigned default name.

  Without renaming, the target devices retain their target names, which can make the relationship between volumes and devices less evident.

- For extent migrations, cleaning destroys the source extent and unclaims the underlying storage-volume if there are no extents on it.

  ⚠ **CAUTION: This command must be run before the batch-migration has been removed. The command will not clean migrations that have no record in the CLI context tree.**

Example

In the following example, source devices are torn down to their storage volumes and the target devices and volumes are renamed after the source device names:

```
VPlexcli:/> batch-migrate clean --rename-targets --file migrate.txt
Using migration plan file /temp/migration_plans/migrate.txt for cleanup phase.
0: Deleted source extent /clusters/cluster-1/devices/R20061115_Symm2264_010, unclaimed
its disks Symm2264_010
1: Deleted source extent /clusters/cluster-1/extents/R20061115_Symm2264_011, unclaimed
its disks Symm2264_011
```

See also

- `batch-migrate cancel`
- `batch-migrate check-plan`
- `batch-migrate commit`
- `batch-migrate create-plan`
- `batch-migrate pause`

● `batch-migrate remove`

batch-migrate commit

Commits the specified batch migration.

Contexts

All contexts.

Syntax

`batch-migrate commit`

`[-f|--file]` *pathname*

Arguments

Required argument	
`[-f|--file]` *pathname*	*Directory and filename of migration plan file. relative paths can be used. if no directory is specified, the default directory is `/var/log/VPlex/cli`on the management server.

Description

Attempts to commit every migration in the batch. Migrations in the batch cannot be committed until all the migrations are complete.

If the command encounters an error, the command displays a warning continues until every migration has been processed.

The batch migration process inserts a temporary RAID 1 structure above the source devices/extents with the target devices/extents as an out-of-date leg of the RAID. Migration can be understood as the synchronization of the out-of-date leg (the target).

After the migration is complete, the commit step detaches the source leg of the temporary RAID and removes the RAID.

The virtual volume, device, or extent is identical to the one before the migration except that the source device/extent is replaced with the target device/extent.

In order to clean a migration job, you must first commit the job.

Use the `batch-migrate summary` command to verify that the migration has completed with no errors before committing the migration.

Examples

This example commits a list of batch migrations specified in `BSO_19`.

```
VPlexcli:/> batch-migrate commit --file BSO_19
```

See also

● `batch-migrate cancel`
● `batch-migrate check-plan`
● `batch-migrate clean`
● `batch-migrate create-plan`

● `batch-migrate remove`

batch-migrate create-plan

Creates a batch migration plan file.

Contexts

All contexts.

Syntax

`batch-migrate create-plan`

`[-f|--sources]` *local-devices*

`[-t|--targets]` *local-devices*

`[--file]` *pathname*

`[--force]`

Arguments

Required arguments	
`[-f|--sources]` *local-devices*	* List of *local-devices* to migrate virtual volumes from. May contain wildcards.
`[-t|--targets]` *local-devices*	* List of *local-devices* to migrate the source virtual volumes to. May contain wildcards.
`--file` *pathname*	* Directory and filename of migration plan file. Relative paths can be used. If no directory is specified, the default directory is `/var/log/VPlex/cli` on the management server.
Optional arguments	
`--force`	Forces an existing plan file with the same name to be overwritten.

* - argument is positional.

Description

The following rules apply to the `batch-migrate create-plan` command:

● The source and target extents must be typed as a comma-separated list, where each element is allowed to contain wildcards.
● If this is an extent migration, the source and target cluster must be the same.
● If this is a device migration, the source and target clusters can be different.
● The source and target can be either local-devices or extents. Mixed migrations from local-device to extent and vice versa are not allowed.
● The command attempts to create a valid migration plan from the source devices/extents to the target devices/extents.

  If there are source devices/extents that cannot be included in the plan, the command prints a warning to the console, but still creates the plan.

● Review the plan and make any necessary changes before starting the batch migration.

Examples

Example: perform a batch migration

1. Create a migration plan.

   Use the `batch-migrate create-plan` command to create a plan to migrate the volumes on all the devices at cluster-1 to the storage at cluster-2:

   ```
   VPlexcli:/> batch-migrate create-plan migrate.txt --sources /clusters/cluster-1/
   devices/* --targets /clusters/cluster-2/devices/*
   ```

2. Use the `batch-migrate check-plan` command to check the plan:

   ```
   VPlexcli:/> batch-migrate check-plan migrate.txt
   ```

   If problems are found, correct the errors and re-run the command until the plan-check passes.

3. Use the `batch-migrate start` command to start the migration:

   ```
   VPlexcli:/> batch-migrate start migrate.txt
   ```

4. Wait for the migration to finish:

   Use the `batch-migrate summary` command to monitor the status of the migration:

   ```
   VPlexcli:/> batch-migrate summary migrate.txt
   Processed 10 migrations from batch migration BR0:
   committed:   0
   complete:    10
   in-progress: 0
   paused:      0
   error:       0
   cancelled:   0
   no-record:   0
   ```

5. When all the migrations are complete, use the `batch-migrate commit` command to commit the migration:

   ```
   VPlexcli:/> batch-migrate commit migrate.txt
   ```

   The source volumes now reside on the target devices.

6. Use `batch-migrate clean` to clean the migration:

   ```
   VPlexcli:/> batch-migrate clean --rename-targets --file migrate.txt
   ```

   This dismantles the source devices down to their storage volumes and renames the target devices and volumes using the source device names.

7. Use the `batch-migrate remove` command to remove the record of the migration:

   ```
   VPlexcli:/> batch-migrate remove migrate.txt
   ```

Example: Pause/resume an in-progress batch migration

```
VPlexcli:/> batch-migrate pause migrate.txt
VPlexcli:/> batch-migrate resume migrate.txt
```

A batch-migration can be canceled at any-time, until the point it is committed.

Cancel and restart a batch migration:

```
VPlexcli:/> batch-migrate cancel migrate.txt
VPlexcli:/> batch-migrate remove migrate.txt
VPlexcli:/> batch-migrate start migrate.txt
```

See also

- `batch-migrate cancel`
- `batch-migrate check-plan`
- `batch-migrate clean`
- `batch-migrate commit`
- `batch-migrate pause`
- `batch-migrate remove`
- `batch-migrate resume`
- `batch-migrate start`
- `batch-migrate summary`

batch-migrate pause

Pauses the specified batch migration.

Contexts

All contexts.

Syntax

```
batch-migrate pause
[--file] pathname
```

Arguments

Required arguments	
`--file` *pathname*	Directory and filename of migration plan file. Relative paths can be used. If no directory is specified, the default directory is `/var/log/VPlex/cli` on the management server.

Description

Pauses every migration in the batch. If the command encounters an error, the command prints a warning and continues until every migration has been processed.

You can pause active migrations (a migration that has been started) and resume that migration at a later time.

- Pause an active migration to release bandwidth for host I/O during periods of peak traffic.

  Use the `batch-migrate pause --file` *pathname* command to pause the specified active migration.

- Resume the migration during periods of low I/O.

  Use the `batch-migrate resume --file` *pathname* command to resume the specified paused migration.

Examples

The following example pauses all of the migrations listed in `BSO_19`.

```
VPlexcli:/> batch-migrate pause --file BS0_19
```

See also

- `batch-migrate cancel`
- `batch-migrate check-plan`
- `batch-migrate clean`
- `batch-migrate commit`
- `batch-migrate create-plan`
- `batch-migrate remove`
- `batch-migrate resume`
- `batch-migrate start`
- `batch-migrate summary`

batch-migrate remove

Removes the record of the completed batch migration.

Contexts

All contexts.

Syntax

```
batch-migrate remove
[--file] Required arguments
```

Arguments

Required arguments	
`--file` *pathname*	Directory and filename of migration plan file. Relative paths can be used. If no directory is specified, the default directory is `/var/log/VPlex/cli` on the management server.

Description

Remove the migration record only if the migration has been committed or canceled.

Migration records are in the `/data-migrations/device-migrations` context.

Examples

Remove a group of migration jobs.

```
VPlexcli:/data-migrations/device-migrations> batch-migrate remove --file migrate.txt
```

or:

```
VPlexcli:> batch-migrate remove /data-migrations/device-migrations --file migrate.txt
```

See also

- `batch-migrate cancel`

- `batch-migrate check-plan`
- `batch-migrate clean`
- `batch-migrate commit`
- `batch-migrate create-plan`
- `batch-migrate pause`
- `batch-migrate resume`
- `batch-migrate start`
- `batch-migrate summary`

batch-migrate resume

Attempts to resume every migration in the specified batch.

Contexts

All contexts.

Syntax

```
batch-migrate resume
[--file] pathname
```

Arguments

Required arguments	
`--file` *pathname*	Directory and filename of migration plan file. Relative paths can be used. If no directory is specified, the default directory is `/var/log/VPlex/cli` on the management server.

Description

Resumes the given batch migration.

If an error is encountered, a warning is printed to the console and the command continues until every migration has been processed.

Examples

Resume all of the migrations specified in the file `BSO_19`.

```
VPlexcli:/> batch-migrate resume --file BS0_19
```

See also

- `batch-migrate cancel`
- `batch-migrate check-plan`
- `batch-migrate clean`
- `batch-migrate commit`
- `batch-migrate create-plan`
- `batch-migrate pause`
- `batch-migrate remove`

- `batch-migrate start`
- `batch-migrate summary`

batch-migrate start

Starts the specified batch migration.

Contexts

All contexts.

Syntax

`batch-migrate start`

`[--file]` *pathname*

`[-s|transfer-size]` `40K - 128M`

`--force`

`--paused`

Arguments

Required arguments	
`--file` pathname	* Directory and filename of migration plan file. Relative paths can be used. If no directory is specified, the default directory is `/var/log/VPlex/cli` on the management server.
Optional arguments	
`[-s|transfer-size]` *size*	Maximum number of bytes to transfer as one operation per device. Specifies the size of read sector designated for transfer in cache. Setting transfer size to a lower value implies more host I/O outside the transfer boundaries. Setting transfer size to a higher value may result in faster transfers. See About transfer-size below. Valid values must be a multiple of 4 K. ● Range: 40 K - 128 M. ● Default: 128 K.
`--force`	Do not ask for confirmation when starting individual migrations. Allows this command to be run using a non-interactive script, .
`--paused`	Starts the migration in a paused state. The migration remains paused until restarted using the `batch-migrate resume` command.

* - argument is positional.

Description

Starts a migration for every source/target pair in the given migration-plan.

⚠ **CAUTION: Inter-cluster migration of volumes is not supported on volumes that are in use. Schedule this activity as a maintenance activity to avoid Data Unavailability.**

Consider scheduling this activity during maintenance windows of low workload to reduce impact on applications and possibility of a disruption.

If a migration fails to start, the command prints a warning to the console. The command continues until every migration item completes been processing.

Individual migrations may ask for confirmation when they start. Use the `--force` argument to suppress these requests for confirmation.

Batch migrations across clusters can result in the following error:

```
VPlexcli:/> batch-migrate start /var/log/VPlex/cli/migrate.txt
The source device 'SveTest_tgt_r0_case2_1_0002' has a volume
'SveTest_tgt_r0_case2_1_0002_vol' in a view. Migrating to device
'SveTest_src_r0_case2_2_0002' will create a synchronous distributed device. In this GEO
system, this can increase the per I/O latency on 'SveTest_tgt_r0_case2_1_0002_vol'. If
applications using 'SveTest_tgt_r0_case2_1_0002_vol' are sensitive to this latency, they
may experience data unavailability.  Do you wish to proceed ? (Yes/No) y
WARNING: Failed to start migration /clusters/cluster-1/devices/
SveTest_tgt_r0_case2_1_0002 --> /clusters/cluster-2/devices/SveTest_src_r0_case2_2_0002
: Evaluation of <<dm migration start -n BR0_0 -f /clusters/cluster-1/devices/
SveTest_tgt_r0_case2_1_0002 -t /clusters/cluster-2/devices/SveTest_src_r0_case2_2_0002
-s 128kB>> failed.
Failed to create a new data-migration.
Unable to attach mirror 'SveTest_src_r0_case2_2_0002' to distributed Device
'MIGRATE_BR0_0'.
Firmware command error.
Active metadata device does not have a free slot.
Started 0 of 1 migrations.
```

Refer to the troubleshooting section of the metro node procedures in the SolVe Desktop for instructions on increasing the number of slots.

About transfer-size

Transfer-size is the size of the region in cache used to service the migration. The area is globally locked, read at the source, and written at the target.

Transfer-size can be as small 40 K, as large as 128 M, and must be a multiple of 4 K. The default recommended value is 128 K.

A larger transfer-size results in higher performance for the migration, but may negatively impact front-end I/O. This is especially true for metro node Metro migrations.

A smaller transfer-size results in lower performance for the migration, but creates less impact on front-end I/O and response times for hosts.

Set a large transfer-size for migrations when the priority is data protection or migration performance. Set a smaller transfer-size for migrations when the priority is front-end storage response time.

Factors to consider when specifying the transfer-size:

- For metro node Metro configurations with narrow inter-cluster bandwidth, set the transfer size lower so the migration does not impact inter-cluster I/O.
- The region specified by transfer-size is locked during migration. Host I/O to or from that region is held. Set a smaller transfer-size during periods of high host I/O.
- When a region of data is transferred, a broadcast is sent to the system. Smaller transfer-size mean more broadcasts, slowing the migration.

Examples

```
VPlexcli:/> batch-migrate start --file BS0_19 --transfer-size 1M
```

See also

- batch-migrate cancel
- batch-migrate check-plan
- batch-migrate clean
- batch-migrate commit
- batch-migrate create-plan

- `batch-migrate pause`
- `batch-migrate remove`
- `batch-migrate resume`
- `batch-migrate summary`
- `dm migration start`

batch-migrate summary

Displays a summary of the batch migration.

Contexts

All contexts.

Syntax

```
batch-migrate summary
[--file] pathname
[-v|--verbose]
```

Arguments

Required arguments	
`--file pathname`	Directory and filename of migration plan file. Relative paths can be used. If no directory is specified, the default directory is `/var/log/VPlex/cli` on the management server.
Optional arguments	
`[-v|verbose]`	In addition to the specified migration, displays a summary for any in-progress and paused migrations.

Description

Displays a summary of the batch migration.

If the `--verbose` option is used, displays in the batch that are in an error state.

Table 3. batch migration summary field descriptions

Field	Description
--verbose output only	
source device	Local-device from which to migrate.
source cluster	Cluster on which source local-device is located.
target device	Local-device to which to migrate.
target cluster	Cluster on which target local-device is located.
migration name	Names of migration files in the batch migration.
status	Status of the individual migration. See below for possible values.
eta	For migrations currently being processed, the estimated time to completion.

Table 3. batch migration summary field descriptions (continued)

Field	Description
--verbose and non --verbose output	
Processed n migrations...	Of the number of source-target pairs specified in the batch migration plan, the number that have been processed.
committed	Of the number of source-target pairs that have been processed, the number that have been committed.
completed	Of the number of source-target pairs that have been processed, the number that are complete.
in-progress	Of the number of source-target pairs that have been processed, the number that are in progress.
paused	Of the number of source-target pairs that have been processed, the number that are paused.
error	Jobs that encountered errors during processing.
cancelled	Of the number of source-target pairs that have been processed, the number that have been cancelled.
no-record	Of the number of source-target pairs that have been processed, the number that have no record in the context tree.

ⓘ **NOTE:** If more than 25 migrations are active at the same time, they are queued, their status is displayed as in-progress, and percentage-complete is displayed as ?.

Examples

Display a batch migration:

```
VPlexcli:/> batch-migrate summary migrate.txt
Processed 10 migrations from batch migration migrate.txt:
committed:    0
complete:     10
in-progress: 0
paused:       0
error:        0
cancelled:    0
no-record:    0
```

Display a batch migration using the --verbose option:

```
VPlexcli:/> batch-migrate summary batch-migrate2.txt --verbose
Command output:
source device          source       target device         target        migration   status
percentage  eta
-------------------- cluster   -------------------- cluster     name        --------
done          ---
-------------------- --------- -------------------- --------- --------- --------
---------- ---
temp1_r1_0_cluster-1 cluster-1  temp2_r1_0_cluster-2  cluster-2  BR1_0       complete
100         -
temp1_r1_1_cluster-1 cluster-1  temp2_r1_1_cluster-2  cluster-2  BR1_1       complete
100         -
temp1_r1_2_cluster-1 cluster-1  temp2_r1_2_cluster-2  cluster-2  BR1_2       complete
100         -
Processed 3 migrations from batch migration BR1:
    committed:    0
    complete:     3
    in-progress: 0
    queued:       0
    paused:       0
```

```
    error:        0
    cancelled:    0
    no-record:    0
```

See also

- `batch-migrate cancel`
- `batch-migrate check-plan`
- `batch-migrate clean`
- `batch-migrate commit`
- `batch-migrate create-plan`
- `batch-migrate pause`
- `batch-migrate remove`
- `batch-migrate resume`
- `batch-migrate start`

capture begin

Begins a capture session.

Contexts

All contexts.

Syntax

`capture begin`

`[-s|session]` *session name*

`[-c|capture-directory]` *capture-directory*

Arguments

Required arguments	
`[-s|--session]` *session name*	* Name of capture session. Output files from the capture session are named using this value.
`[-c|--capture-directory]` *directory*	* Pathname for the capture directory. Default capture directory: `/var/log/ VPlex/cli/capture`

* - argument is positional.

Description

The session captures saves all the stdin, stdout, stderr, and session I/O streams to 4 files:

- *session name-session*`.txt` - Output of commands issued during the capture session.
- *session name-stdin*`.txt` - CLI commands input during the capture session.
- *session name-stdout*`.txt` - Output of commands issued during the capture session.
- *session name-stderr*`.txt` - Status messages generated during the capture session.
- ⓘ **NOTE:** Raw tty escape sequences are not captured. Use the `--capture` shell option to capture the entire session including the raw tty sequences.

Capture sessions can have nested capture sessions but only the capture session at the top of the stack is active.

Use the `capture end` command to end the capture session.

Use the `capture replay` command to resubmit the captured input to the shell.

Examples

In the following example, the `capture begin` command starts a capture session named `TestCapture`. Because no directory is specified, output files are placed in the `/var/log/VPlex/cli/capture` directory on the management server.

```
VPlexcli:/> capture begin TestCapture
# capture begin TestCapture
VPlexcli:/>
```

See also

- `capture end`
- `capture pause`
- `capture replay`
- `capture resume`

capture end

Ends the current capture session and removes it from the session capture stack.

Contexts

All contexts.

Syntax

`capture end`

Description

The session at the top of the stack becomes the active capture session.

Examples

End a capture session.

```
VPlexcli:/clusters/cluster-1> capture end
# capture end TestCapture
VPlexcli:/clusters/cluster-1>
```

See also

- `capture begin`
- `capture pause`
- `capture replay`
- `capture resume`

capture pause

Pauses the current capture session.

Contexts

All contexts.

Syntax

```
capture pause
```

Description

Pause/resume operates only on the current capture session.

Examples

Pause a capture session.

```
VPlexcli:/> capture pause
```

See also

- `capture begin`
- `capture end`
- `capture replay`
- `capture resume`

capture replay

Replays a previously captured session.

Contexts

All contexts.

Syntax

```
capture replay
[-s|-session] session name
[-c|--capture-directory] directory
```

Arguments

Required arguments	
`[-s|--session]` *session name*	* Name of existing capture session.

[-c| --capture-directory] *directory*	* Directory where existing captured session is located. Default directory `/var/log/VPlex/cli/capture/recapture`

* - argument is positional.

Description

Replays the commands in the `stdin.txt` file from the specified capture session.

Output of the replayed capture session is written to the `/var/log/VPlex/cli/capture/recapture` directory on the management server.

Output is the same four files created by capture begin.

Example

Replay a capture session.

```
VPlexcli:/> capture replay TestCapture
Attributes:
Name                     Value
---------------------    -------------------------------------------
allow-auto-join          true
auto-expel-count         0
auto-expel-period        0
.
.
.
```

See also

- `capture begin`
- `capture end`
- `capture pause`
- `capture resume`

capture resume

Resumes the current capture session.

Contexts

All contexts.

Syntax

`capture resume`

Description

Pause/resume operates only on the current capture session.

Examples

Resume the current capture session.

```
VPlexcli:/> capture resume
```

See also

- capture begin
- capture end
- capture pause
- capture replay

cd

Changes the working directory.

Contexts

All contexts.

Syntax

cd [*context*]

Arguments

Optional arguments	
context	Change to the specified context. The context can be one of the following: ● context path - The full or relative pathname of the context. ● .. - the parent context of the context you are currently in. ● ... - the root context. ● -(dash) - The context you were in before changing to this context. If you do not specify a *context*, the cd command changes to the root directory.

Description

Use the cd command with no arguments or followed by three periods (cd ...) to return to the root context.

Use the cd command followed by two periods (cd ..) to return to the context immediately above the current context.

Use the cd command followed by a dash (cd -) to return to the previous context.

To navigate directly to a context from any other context, use the cd command and specify the *context path*.

Examples

Return to the root context:

```
VPlexcli:/clusters/cluster-1/fans> cd
VPlexcli:/>
```

Return to the context immediately above the current context:

```
VPlexcli:/monitoring/directors/director-1-1-B> cd ..
VPlexcli:/monitoring/directors>
```

Navigate directly to a context from any other context:

```
VPlexcli:/clusters/clusters-1/fans> cd /clusters/cluster-1/fans/
```

cluster add

Adds a cluster to a running metro node.

Contexts

All contexts.

Syntax

```
cluster add
[-c|--cluster] context path
[-t|--to] cluster
[-f|--force]
```

Arguments

Required arguments	
[-c|--cluster] context path	* Cluster to add.
[-t|--to] cluster	* Cluster to which the given cluster is added. This is only necessary if the system cannot be automatically determined.
Optional arguments	
[-f|--force]	Forces the cluster addition to proceed even if conditions are not optimal.

* - argument is positional.

Description

Before a cluster can communicate with the other cluster of a Metro, you must use the cluster add command.

Use the --to argument:

● During system bring-up when no clusters have yet been told about other clusters. In this scenario, any cluster can be used as the system representative.
● Multiple systems have been detected. Connection to multiple systems, is not supported.

If there only one system actually present, but it has split into islands due to connectivity problems, it is highly advisable to repair the problems before proceeding. Add the given cluster to each island separately.

If the intention is to merge two existing systems, break up one of the systems and add it to the other system cluster-by-cluster.

Examples

In the following example:

- The `cluster add` command adds two clusters.
- The `cluster summary` command verifies that the two clusters have the same island ID:

```
VPlexcli:/clusters/> cluster add cluster-1 cluster-2
VPlexcli:/clusters> cluster summary
Clusters:
    Name      Cluster ID    TLA        Connected     Expelled    Operational Status
Health State
    ---------  ----------   ---------   ---------    --------
-----------------    ------------
    cluster-1   1     FNM00103600160    true    false    ok    ok
    cluster-2   2     FNM00103600161    true    false    ok    ok
 Islands:
 Island ID   Clusters
 ----------   -------------------
 1           cluster-1, cluster-2
```

See also

- `cluster expel`
- `cluster status`
- `cluster summary`

cluster configdump

Dumps cluster configuration in an XML format, optionally directing it to a file.

Contexts

All contexts.

In `/clusters` context, command is `configdump`.

Syntax

```
cluster configdump
```

`[-c|--cluster]` *cluster*

`[-d|--dtdOnly]`

`[-f|--file]` *filename*

Arguments

Optional arguments	
`[-c|--clusters]` *cluster*	Dump configuration information for only the specified cluster.
`[-d|--dtdOnly]`	Print only the Document Type Definitions (DTD) document.
`[-f|--file]` *filename*	Direct the configdump output to the specified file. Default location for the output file on the management server is: `/var/log/VPlex/cli`.

Description

Dumped data includes:

- I/O port configurations
- Disk information, including paths from the directors to the storage volumes
- Device configuration and capacity
- Volume configuration
- Initiators
- View configuration
- System-volume information

The XML output includes the DTD to validate the content.

Examples

Dump cluster-1's configuration to an `.xml` file:

```
VPlexcli:/clusters/> configdump -c cluster-1 -f cluster1_config.xml
```

Dump the configuration at cluster-1, navigate to the cli context on the management server, and display the file:

```
VPlexcli:/clusters> configdump --verbose --file /var/log/VPlex/cli/config-dump-
cluster-1.txt --cluster cluster-1
VPlexcli:/clusters> exit
Connection closed by foreign host.
service@ManagementServer:~> cd /var/log/VPlex//cli
service@ManagementServer:/var/log/VPlex/cli> tail config-dump-cluster-1.txt
  </views>
  <system-volumes>
    <meta-volumes>
      <meta-volume active="true" block-count="23592704" block-size="4096B"
geometry="raid-1" locality="local" name="metadata_1" operational-status="ok"
ready="true" rebuild-allowed="true" size="96635715584B" system-id="metadata_1"/>
    </meta-volumes>
    <logging-volumes>
      <logging-volume block-count="20971520" block-size="4096B" geometry="raid-0"
locality="local" name="logging_1_vol" operational-status="ok" size="85899345920B" system-
id="logging_logging_1_vol"/>
    </logging-volumes>
  </system-volumes>
.
.
.
```

See also

- `collect-diagnostics`
- `director appcon`
- `getsysinfo`
- `sms dump`

cluster expel

Expels a cluster from its current island.

Contexts

All contexts.

In /clusters context, command is expel.

Syntax

```
cluster expel
[-c|--cluster] cluster
[-f|--force]
```

Arguments

Required arguments	
[-c|--clusters] cluster	* The cluster to expel.
[-f|--force]	Forces the cluster to be expelled.

* - argument is positional.

Description

Cluster expulsion prevents a cluster from participating in a metro node. Expel a cluster when:

- The cluster is experiencing undiagnosed problems.
- To prepare for scheduled outage.
- The target cluster, or the WAN over which the rest of the system communicates, is going to be inoperable for a while.
- An unstable inter-cluster link impacts performance.

An expelled cluster is still physically connected to the metro node, but not logically connected.

The --force argument is required for the command to complete.

Use the cluster unexpel command to allow the cluster to rejoin the island.

Examples

In the following example:

- The cluster expel command expels the cluster.
- The cluster summary and cluster status commands verify the change.

```
VPlexcli::/> cluster expel cluster-1 --force
Cluster 'cluster-1' has been successfully expelled.
VPlexcli:/> cluster summary
  Clusters:
  Name       Cluster ID  TLA             Connected  Expelled  Operational Status  Health
State
  --------   ----------  --------------  ---------  --------  ------------------
-------------
  cluster-1  1           FNM00103600160  true       true      isolated
degraded
  cluster-2  2           FNM00103600161  true       false     degraded
degraded
Islands:
  Island ID  Clusters
  ---------  ---------
  1          cluster-1
  2          cluster-2
VPlexcli:/> cluster status
Cluster cluster-1
operational-status:       isolated
transitioning-indications: suspended volumes,expelled
transitioning-progress:
```

```
health-state:              degraded
health-indications:        1 suspended Devices
Cluster cluster-2
operational-status:        degraded
transitioning-indications: suspended exports,suspended volumes
transitioning-progress:
health-state:              degraded
health-indications:        2 suspended Devices
```

See also

- `cluster unexpel`

cluster forget

Tells metro node and Unisphere for metro node to forget the specified cluster.

Contexts

All contexts.

In /clusters context, command is forget.

Syntax

`cluster forget`

`[-c|--cluster]` *context path*

`[-d|--disconnect]`

`[-f|--force]`

Arguments

Required arguments	
`[-c|--clusters]` *context path*	* Cluster to forget.
Optional arguments	
`[-d|--disconnect]`	Disconnect from all directors in the given cluster and remove the cluster from the context tree after the operation is complete.
`[-f|--force]`	Force the operation to continue without confirmation.

* - argument is positional.

Description

Removes all references to the specified cluster from the context tree.

The prerequisites for forgetting a cluster are as follows:

- The target cluster can not be in contact with other connected clusters.
- The Unisphere for metro node cannot be connected to the target cluster.
- Detach all distributed devices with legs at the target cluster (there must be no distributed devices with legs on the target cluster).
- No rule sets that affect the target cluster.

- No globally visible devices at the target cluster.

Use the following steps to forget a cluster:

1. If connected, use the cluster forget command on the target cluster to forget the other clusters.
2. Use the cluster forget command on all other clusters to forget the target cluster.

This command does not work if the clusters have lost communications with each other. If a cluster is down, destroyed, or removed, use the cluster expel command to expel it.

Examples

```
VPlexcli:/clusters/> cluster forget --cluster cluster-1 --disocnnect --force
```

See also

- `cluster add`
- `cluster expel`
- `cluster status`
- `cluster unexpel`

cluster show-remote-devices

Displays the list of remote devices for the specified cluster.

Contexts

All contexts.

Syntax

`cluster show-remote-devices` *options cluster*

Description

The command displays the list of remote devices for the specified cluster. The top-level volumes and the list of views at which the devices are exported are also listed. Use the `--verbose` option to see the complete list.

Arguments

Required arguments	
`options`	
`positional arguments`	
Optional arguments	
`-h	--help`	Displays the usage for the command.
`--verbose`	Provides more output during command execution. This may not have any effect for some commands.
`-s	--include-sub-devices`	Displays all remote RAIDs. If sub devices are not specified, the command displays only the top-level RAIDs.

-[-c | --cluster=] *cluster context*	Specifies the context path of the cluster to show the remote devices.

Examples

```
VPlexcli:/> cluster show-remote-devices -c cluster-1 --include-sub-devices


Remote Device        Virtual Volume   Cluster     Views
-----------------    -------------    ---------   --------

c2_dev               c2_dev_vol       cluster-1   [View_67]

c2_Dr_device0049_2   -                -           -

c2_Dr_device0048_2   -                -           -

c2_Dr_device0047_2   vol2             -           -

c2_Dr_device0046_2   vol3             cluster-1   [view1, view2]

c2_Dr_device0045_2   -                -           -

c2_Dr_device0044_2   -                -           -

c2_Dr_device0043_2   vol4             cluster-2   [view3]

c2_Dr_device0042_2   -                -           -

c2_Dr_device0041_2   -                -           -
(181 more)
To see all results please run the command with --verbose option.
```

Show top-level devices only:

```
VPlexcli:/> cluster show-remote-devices -c cluster-2


Remote Device         Virtual Volume   Cluster     Views
--------------------  -------------    ---------   --------

device_remotevol1_c1  remotevol1       cluster-2   [View_49]
```

Show remote devices with verbose option:

```
VPlexcli:/> cluster show-remote-devices -c cluster-1 --verbose


Remote Device        Virtual Volume   Cluster     Views
-----------------    -------------    ---------   --------

c2_dev               c2_dev_vol       cluster-1   [View_67]

c2_Dr_device0049_2   -                -           -

c2_Dr_device0048_2   -                -           -

c2_Dr_device0047_2   vol2             -           -

c2_Dr_device0046_2   vol3             cluster-1   [view1, view2]

c2_Dr_device0045_2   -                -           -

c2_Dr_device0044_2   -                -           -

c2_Dr_device0043_2   vol4             cluster-2   [view3]

c2_Dr_device0042_2   -                -           -

c2_Dr_device0041_2   -                -           -
```

```
c2_Dr_device0040_2      -               -           -

c2_Dr_device0039_2      -               -           -

c2_Dr_device0038_2      -               -           -

c2_Dr_device0037_2      -               -           -

c2_Dr_device0036_2      -               -           -

c2_Dr_device0035_2      -               -           -

c2_Dr_device0034_2      -               -           -

c2_Dr_device0033_2      -               -           -
```

cluster shutdown

Starts the orderly shutdown of all directors at a single cluster.

Contexts

All contexts.

In /clusters context, command is shutdown.

Syntax

```
cluster shutdown
[-c|--cluster] context path
--force
```

Arguments

Required arguments	
`[-c|--cluster]` *context path*	Cluster to shut down.
`[-f|--force]`	Forces the shutdown to proceed.

Description

⚠️ **WARNING: Shutting down a metro node cluster could cause data unavailability. Please refer to the metro node procedures in the SolVe Desktop for the recommended procedure to shut down a cluster.**

Shuts down the cluster firmware.

ⓘ **NOTE:** Does not shut down the operating system on the cluster.

Use this command as an alternative to manually shutting down the directors in a cluster. When shutting down multiple clusters:

● Shut each cluster down one at a time.
● Verify that each cluster has completed shutdown prior to shutting down the next one.

If shutting down multiple clusters, refer to the metro node procedures in the SolVe Desktop for the recommended procedure for shutting down both clusters.

When a cluster completes shutting down, the following log message is generated for each director at the cluster:

```
'Director shutdown complete (cluster shutdown)'
```

Examples

In the following example:

- The cluster `shutdown command` without the `--force` argument starts the shutdown of the specified cluster.

  Because the `--force` argument was not used, a prompt to continue is displayed.

- The `cluster summary` commands display the transition to shutdown.
- The `ll` command in `clusters/cluster-n` context displays the shutdown cluster.

```
VPlexcli:/> cluster shutdown -c cluster-1
VPlexcli:/> cluster shutdown cluster-1
Warning: Shutting down a VPlex cluster may cause data unavailability.  Please refer to
the VPlex documentation for the recommended procedure for shutting down a cluster. To
show that you understand the impact enter 'SHUTDOWN': SHUTDOWN

You have chosen to shutdown 'cluster-1'. To confirm, enter 'cluster-1': cluster-1

Status     Description
--------   ----------------
Started.   Shutdown started.
VPlexcli:/> cluster summary
Clusters:
  Name        Cluster ID TLA                                   Connected  Expelled
Operational Status  Health State
  ---------   --------- ---------                              ---------  --------
  ----------------- ------------
  cluster-1  1                            FNM00103600160           true       false
unknown             unknown
  cluster-2  2                            FNM00103600161           true       false     ok
          ok
Islands:
  Island ID  Clusters
  ---------  --------------------
  1          cluster-1, cluster-2
VPlexcli:/> cluster summary
Clusters:
Name                    Cluster ID               TLA                           Connected
Expelled         Operational Status Health State
---------               ----------               ---------                     --------- --------
     ----------------- ------------
cluster-1               1                         FNM00103600160       false         -
-                         -
cluster-2               2                         FNM00103600161       true          false
     degraded                         degraded
Islands:
  Island ID  Clusters
  ---------  ---------
  2          cluster-2
Connectivity problems:
  From       Problem    To
  ---------  ---------  ---------
  cluster-2  can't see  cluster-1
VPlexcli:/> ll /clusters/cluster-1
Attributes:
Name                    Value
--------------------    ------------
allow-auto-join         -
auto-expel-count        -
auto-expel-period       -
auto-join-delay         -
cluster-id              7
connected               false
default-cache-mode      -
default-caw-template    true
```

```
director-names          [DirA, DirB]
island-id               -
operational-status      not-running
transition-indications  []
transition-progress     []
health-state            unknown
health-indications      []
```

See also

- `cluster add`
- `cluster expel`
- `cluster forget`
- `director shutdown`

cluster status

Displays a cluster's operational status and health state.

Contexts

All contexts.

Syntax

```
cluster status
```

Description

The following table shows the fields displayed in the `cluster status` command:

Table 4. cluster status field descriptions

Field	Description
`operational status`	Operational status of the cluster. During transition periods cluster moves from one operational state to another. • `cluster departure` - One or more of the clusters cannot be contacted. Commands affecting distributed storage are refused. • `degraded` - The location is not functioning at an optimal level. This may indicate non-functioning remote virtual volume, unhealthy devices or storage volumes, suspended devices, conflicting director count configuration values, out-of-date devices, and so forth. • `device initializing` - If clusters cannot communicate with each other, then the distributed-device will be unable to initialize. • `device out of date` - Child devices are being marked fully out of date. Sometimes this occurs after a link outage. • `expelled` - The cluster has been isolated from the island either manually (by an administrator) or automatically (by a system configuration setting). • `ok` - The cluster is operating normally. • `shutdown` - The cluster's directors are shutting down. • `suspended exports` - Some I/O is suspended. This could be result of a link failure or loss of a director. Other states might indicate the true problem. It may `not` be a problem, and the metro node might be waiting for you to confirm the resumption of I/O.

Table 4. cluster status field descriptions (continued)

Field	Description
	`transitioning` - Components of the software are recovering from a previous incident (for example, the loss of a director or the loss of an inter-cluster link).
`transitioning -indications`	Additional information if the transitioning-progress is anything other than blank.
`transitioning-progress`	Indicates progress for supported transitions.
`health-state`	`critical failure` - The cluster is not functioning and may have failed completely. This may indicate a complete loss of back-end connectivity. `degraded` - The cluster is not functioning at an optimal level. This may indicate non-functioning remote virtual volume, unhealthy devices or storage volumes, suspended devices, conflicting director count configuration values, or out-of-date devices. `ok` - The cluster is functioning normally. `unknown` - Metro node cannot determine the cluster's health state, or the state is invalid. `major failure` - The cluster is failing and some functionality may be degraded or unavailable. This may indicate complete loss of back-end connectivity. `minor failure` - The cluster is functioning, but some functionality may be degraded. This may indicate one or more unreachable storage volumes.
`health-indications`	Additional information if the health-state field is anything other than `ok`.
`local-com`	`ok` - All wan-com links have the expected connectivity: this port-group is operating correctly. `warning` - Some links have unexpected connectivity. This port-group is operational but not properly configured. Performance may not be optimal. `error` - Some connectivity is missing from this port-group. It is not operating correctly. `fail` - All connectivity is missing from this port-group. wan-com is not operational.
`virtual-ha`	`ok` - The cluster is Highly Available. `major failure` - The cluster is not Highly Available and some functionality may be degraded or unavailable. `minor failure` - The cluster is functioning, but some functionality may be degraded. `failed to validate virtual-ha` - Indicates that evaluation of the virtual-ha status failed, and provides some details why the virtual-ha status could not be validated.
`Certificates`	`ok` - The system has a valid certificate. `warning` - The certificate will expire in 30 days. Expired certificates can impact inter-cluster connectivity, which can lead to data unavailability. Renew the certificates using the `vplex_system_config -i --show-ssl-certificates` command before their expiry. `error` - The certificate has expired, or a certificate is not found on the cluster. Expired certificates can impact inter-cluster connectivity and it can lead to data unavailability. If a certificate is expired, renew it using the `vplex_system_config -i --show-ssl-certificates` command. If a certificate is not found on the system, create new certificates using the `vplex_system_config -i --update-ssl-certificates` command.
`wan-com`	`full` - All port-groups have a status of either ok or warning. wan-com connectivity is complete through minor configuration errors may still exist. See individual port-group statuses.

Table 4. cluster status field descriptions (continued)

Field	Description
	`partial` - Some port-groups have a status of error or fail, but at least one port-group has a status of `ok` or warning. `WAN COM` is operating (possibly minimally) through at least one channel. Performance is degraded. `none` - All port-groups have a status of either error or fail. wan-com is not operational. `not-applicable` - The system is a single-cluster (i.e. Local) system. Validating wan-com connectivity is not applicable.
`license`	Whether the license is installed or not.

See also

- `cluster summary`
- `ds summary`

cluster summary

Displays a summary of all clusters and the connectivity between them.

Contexts

All contexts.

In `/clusters` context, command is `summary`.

Syntax

```
cluster summary
```

Description

The following table shows the fields available in the `cluster summary` output.

Table 5. cluster summary field descriptions

Field	Description
Clusters:	
`Name`	Name of the cluster.
`Cluster ID`	For metro node Local, always 1. For metro node Metro, 1 or 2.
`TLA`	The Top-level Assembly. The product TLA must uniquely identify the product instance. For metro node the TLA must uniquely identify the cluster (which is the rack and all physical components in it)
`Connected`	Whether or not the CLI is connected to at least one director in the cluster (connected to the cluster). `true` - CLI is connected to the cluster. `false` - CLI is not connected to the cluster.
`Expelled`	`true` - The cluster is expelled from its island. `false` - The cluster is not expelled from its island.

Table 5. cluster summary field descriptions (continued)

Field	Description
Operational Status	- degraded - The cluster is not operating as configured and is not currently transitioning. Examples include: degraded redundancy level (a director is dead), all exports switched to write through because of hardware health problems, suspended virtual volumes, suspended exports, storage volumes not visible from all directors, meta-volume not yet processed. - isolated - The cluster is not communicating with any other clusters. - ok - The cluster is functioning normally. - transitioning - The cluster is reacting to external events and may not be operating as configured. I/O may be suspended during the transition period. - If no meta-volume has been configured, operational status is transitioning. - unknown - The metro node encountered a problem determining the operational status of the cluster. This may indicate a degraded state, since it usually means that at least one of the directors is not responding or is communicating abnormally.
Health State	- critical failure - The cluster is not functioning and may have failed completely. This may indicate a complete loss of back-end connectivity. - degraded - The cluster is not functioning at an optimal level. This may indicate non-functioning remote virtual volumes, unhealthy devices or storage volumes, suspended devices, conflicting director count configuration values, out-of-date devices, and so forth. - ok - The cluster is functioning normally. - unknown - The metro node cannot determine the cluster's health state, or the state is invalid. - major failure - The cluster is failing and some functionality may be degraded or unavailable. This may indicate complete loss of back-end connectivity. - minor failure - The cluster is functioning, but some functionality may be degraded. This may indicate one or more unreachable storage volumes.
Islands:	
Island ID	ID of the island. For current release, always 1.
Clusters	Names of clusters belonging to the island. For current release, always cluster-1 or cluster-2.

Examples

Display summary for healthy clusters:

```
VPlexcli:/> cluster summary
Clusters:
  Name       Cluster ID   TLA            Connected  Expelled  Operational Status  Health
State
  ---------  ----------   --------------  ---------  --------  ------------------  -----------
------------
  cluster-1  1            43A5DL9        true       false     ok                  ok
  cluster-2  2            43A7DL9        true       false     ok                  ok
```

```
Islands:
  Island ID  Clusters
  ---------  -------------------
  1          cluster-1, cluster-2
```

Display cluster summary for metro node Metro configuration with a inter-cluster link outage:

```
VPlexcli:/> cluster summary
Clusters:
  Name       Cluster ID  TLA             Connected  Expelled  Operational Status  Health
State
  ---------  ----------  --------------  ---------  --------  ------------------
------------
  cluster-1  1           43A5DL9         true       false     ok
degraded
  cluster-2  2           43A7DL9         true       false     ok
degraded


Islands:
  Island ID  Clusters
  ---------  ---------
  1          cluster-1
  2          cluster-2
```

Display cluster summary for metro node Metro configuration with a cluster expelled:

```
VPlexcli:/> cluster summary
Clusters:
  Name       Cluster ID  TLA             Connected  Expelled  Operational Status  Health
State
  ---------  ----------  --------------  ---------  --------  ------------------
------------
  cluster-1  1           43A5DL9         true       true      isolated
degraded
  cluster-2  2           43A7DL9         true       true      isolated
degraded


Islands:
  Island ID  Clusters
  ---------  ---------
  1          cluster-1
  2          cluster-2
```

See also

- `cluster status`

cluster unexpel

Allows a cluster to rejoin the metro node.

Contexts

All contexts.

In `/clusters` context, command is `unexpel`.

Syntax

```
cluster unexpel
```

```
[-c|--cluster] context path
```

Arguments

Required arguments	
`[-c|--cluster]` *context path*	Cluster to unexpel.

Description

Clears the expelled flag for the specified cluster, allowing it to rejoin the metro node.

Examples

To manually unexpel a cluster, do the following:

1. Use the `cluster summary` command to verify that the cluster is expelled.

```
VPlexcli:/> cluster summary
Clusters:
  Name       Cluster ID  TLA             Connected  Expelled  Operational Status
Health State
  ---------  ----------  --------------  ---------  --------  ------------------
------------
  cluster-1  1           FNM00190701072  true       false     ok                        ok
  cluster-2  2           FNM00190701073  true       false     ok                        ok


Islands:
  Island ID  Clusters
  ---------  --------------------
  1          cluster-1, cluster-2
```

2. Use the `ll` command in the target cluster's `cluster` context to display the cluster's `allow-auto-join` attribute setting.

```
VPlexcli:/> ll /clusters/cluster-1
/clusters/cluster-1:
Attributes:
Name                            Value
------------------------------  --------------------------------
allow-auto-join                 true
auto-expel-count                0
auto-expel-period               0
auto-join-delay                 0
cluster-id                      1
.
.
.
```

If the cluster's `allow-auto-join` attribute is set to true, the cluster automatically rejoins the system. Skip to step 4.

3. Navigate to the target cluster's `cluster` context and use the `set` command to set the cluster's **allow-auto-join** flag to true. For example:

```
VPlexcli:/ cd clusters/cluster-1
VPlexcli:/clusters/cluster-1> set allow-auto-join true
```

4. Use the `cluster unexpel` command to manually unexpel a cluster, allowing the cluster to rejoin metro node. The syntax for the command is:

For example:

```
VPlexcli:/clusters> cluster unexpel --cluster cluster-1
```

5. Use the `cluster summary` command to verify all clusters are in one island and working as expected.

```
VPlexcli:/>cluster summary
Clusters:
  Name       Cluster ID  TLA             Connected  Expelled  Operational Status
Health State
  ---------  ----------  --------------  ---------  --------  ------------------
------------
  cluster-1  1           FNM00091300128  true       false     ok                           ok
  cluster-2  2           FNM00091300218  true       false     ok                           ok
Islands:
  Island ID  Clusters
  ---------  --------------------
  1          cluster-1, cluster-2
```

See also

- `cluster expel`

collect-diagnostics

Collects the core files from each component, logs, and configuration information from the management server and directors.

Contexts

All contexts.

Syntax

```
collect-diagnostics
      --local-only
```

Arguments

Optional arguments	Description
`--local-only`	Gathers diagnostics only from the local cluster and directors.
`-r ǀ --log-range= Range`	Collect only the logs that are generated in the range specified. To collect the set of logs that are generated in a certain range of hours of the current day, specify the value as *start-hour-end-hour>*. For example, to collect the logs between 11AM to 1PM, enter the *range* `11-13h`. To collect the set of logs generated in a certain range of days in the current month, enter the range *start-day-end-day*d. For example, to get the logs between 11 days ago to 13 days ago, enter the *range* of `11-13d`.
`-l ǀ --last-logs= x`	Collect only the logs that are generated in the last *x* days or hours are collected. To collect the logs generated in the last 4 hours, the value for this option is 4h. To collect the logs generated in last *4* days, use the value 4d.
`--noextended`	Omits the collection of extended diagnostics.

Description

Collects logs, cores, and configuration information from the management server and directors. Places the collected output files in the `/diag/collect-diagnostics-out` directory on the management server.

Two compressed files are placed in the `/diag/collect-diagnostics-out` directory:

- `<tla>-<cluster>-diag-<datetime>.tar.gz-` Contains standard diagnostic logs.
- `<tla>-<cluster>-diag-ext-<datetime>.tar.gz-` Contains standard diagnostic logs, java heap dump, fast trace dump, two latest core files, and two latest core files (if `--noextended` is used, then no core file is collected).

  ⓘ **NOTE:** If `--noextended` is used, then this file is not available.

ⓘ **NOTE:** The collect-diagnostics must be run as the service user to collect all the available files. For this, the VPlexcli command must be invoked as the service user.

Best practice is to collect both files. The extended file is large, and thus takes some time to transfer.

Recommended practice is to transfer the base file (`tla-diagnostics-timestamp.tar.gz`) first and begin analysis while waiting for the extended file to transfer.

ⓘ **NOTE:** On metro node Metro configurations, collect-diagnostics must be invoked from each management server in order to collect complete diagnostics. The management server diagnostics files are only collected for the local cluster.

The director diagnostics are retrieved from ALL directors in a metro node Metro unless the `--local-only` argument is used.

All trace files under the folder /cores/nsfw-trace/ on each director will be copied and put in the collected diagnostics.

⚠ **CAUTION: In metro node Metro configurations, run the `collect-diagnostics` command on each management server, but NOT at the same time. Even if you use the `--local-only` argument, do not run the command on both management servers at the same time.**

If you know the time period in which an event happened, you can collect a subset of logs based on time period. This reduces the time to collect diagnostics. Use the `--log-range` and `--last-logs` arguments to collect a subset of diagnostics.

Remove files created by collect-diagnostics from the management server as soon as possible to avoid filling management server disk partitions.

Example

Collect diagnostics for the entire cluster:

```
VPlexcli:/> collect-diagnostics
```

If this is a metro configuration, then run it on each cluster independently.

```
VPlexcli:/> collect-diagnostics --noextended
```

Collect diagnostics, omitting trace files on the directors and the management server console heap, and send the output to the default directory.

See also

- `cluster configdump`
- `director appdump`
- `getsysinfo`
- `sms dump`

configuration get-product-type

Displays the metro node product type (Local or Metro).

Contexts

All contexts.

Syntax

```
configuration get-product-type
```

Description

Displays whether the system is a Local or Metro configuration .

Example

Display the configuration type.

```
VPlexcli:/> configuration get-product-type
The cluster is currently configured as a metro node Metro
```

See also

- `cluster status`
- `cluster summary`
- `version`

configuration join-clusters

Validates WAN connectivity and joins the two clusters.

Contexts

All contexts.

Syntax

```
configuration join-clusters
```

`[-i|--remote-ip]` *remote IP address*

`[-h|--help]`

Arguments

Optional arguments	Description
`[-i|--remote-ip]` *remote IP address*	Specifies the IP address of the remote server.
`[-h|--help]`	Displays command line help.

Description

This command validates WAN connectivity and joins the two clusters.

ⓘ **NOTE:** This command can be configured as Metro Fibre Channel using the EZ-Setup wizard.

Example

Join clusters at the specified remote IP address:

```
VPlexcli:/> configuration join-clusters -i 10.103.97.76
Verifying the connectivity of all the directors...
Verifying that all the pre-conditions for director connectivity are satisfied...
All the directors are properly connected to each other...
Verifying island ID
Running the Join Cluster task
Verifying island ID
Added cluster 'cluster-1' to system (cluster-2).
Join Cluster task completed.
The clusters are now joined and ready for use.
```

See also

- cluster add
- configuration continue-system-setup
- configuration system-setup

configuration metadata-backup

Configures and schedules the daily backup of metro node metadata.

Contexts

All contexts.

Syntax

```
configuration metadata-backup
```

Description

Selects the volumes to use as backup volumes and creates the initial backup of both volumes.

The meta-volume's backup size should be equal to or greater than the active meta-volume size. The current requirement is 78G per storage volume.

See the Dell EMC metro node Technical Notes for best practices regarding the kind of back-end array volumes to consider for a meta-volume.

(i) **NOTE:** This command must be executed on the management server in which you want to create the backups.

Runs an interview script that prompts for values to configure and schedule the daily backups of metro node metadata.

- Selects the volumes on which to create the backup
- Updates the metro node configuration `.xml` file (`VPlexconfig.xml`)
- Creates an initial backup on both selected volumes
- Creates two backup volumes named:
  - *volume-1*`_backup_timestamp`
  - *volume-2*`_backup_timestamp`
- Schedules a backup at a time selected by the user

Enter two or more storage volumes, separated by commas.

⚠ **CAUTION: Renaming backup metadata volumes is *not* supported.**

> **Specify two or more storage volumes. Storage volumes must be:**
> **- `unclaimed`**
> **- on different arrays**

Example

Configure the metro node metadata backup schedule:

```
VPlexcli:/clusters/cluster-1/system-volumes> configuration metadata-backup
Configuring Meta-data Backups
To configure meta-data backups you will need to select two volumes (78G or greater),
preferably on two different arrays. Backups will occur automatically each day, at a time
you specify.
 Available Volumes for Meta-data Backup
Name                                     Capacity  Vendor    IO Status  Type
---------------------------------------- --------  --------  ---------  ---------
VPD83T3:6000097000019260171453303646423 80.1G     EMC       alive      traditional
VPD83T3:6000097000019260171453303646423 80.1G     EMC       alive      traditional
Please select volumes for meta-data backup, preferably from two different arrays
(volume1,volume2):VPD83T3:6000097000019260171453303646423,VPD83T3:6000097000019260171453
3036464237
What hour of the day should the meta-data be backed up? (0..23): 11
What minute of the hour should the meta-data be backed up? (0..59): 25
Metro node is configured to back up meta-data every day at 11:25 (UTC).
Would you like to change the time the meta-data is backed up? [no]: no
Review and Finish
Review the configuration information below. If the values are correct, enter
yes (or simply accept the default and press Enter) to start the setup process. If the
values are not correct, enter no to go back and make changes or to exit the setup.
   Meta-data Backups
     Meta-data will be backed up every day at 11:25.
     The following volumes will be used for the backup :
VPD83T3:6000097000019260171453303646423,
VPD83T3:6000097000019260171453303646423
Would you like to run the setup process now? [yes]:
```

Modify the existing daily backup of metro node metadata:

```
VPlexcli:/clusters/cluster-1/system-volumes> configuration metadata-backup
A back up of the meta-data is already scheduled to occur everyday at 11:25 (UTC). Do you
want change the existing schedule? (Y/N): y
Configuring Meta-data Backups
To configure meta-data backups you will need to select two volumes (78G or greater),
preferably on two different arrays. Backups will occur automatically each day, at a time
you specify.
metro node is currently configured to backup metadata on the following volumes :
VPD83T3:6000097000019260171453303646423,
VPD83T3:6000097000019260171453303646423
Would you like to change the volumes on which to backup the metadata? [no]:
Metro node is configured to back up meta-data every day at 11:25 (UTC).
Would you like to change the time the meta-data is backed up? [no]: yes
What hour of the day should the meta-data be backed up? (0..23): 11
What minute of the hour should the meta-data be backed up? (0..59): 00
Metro node is configured to back up meta-data every day at 11:00 (UTC).
Review and Finish
 Review the configuration information below. If the values are correct, enter
 yes (or simply accept the default and press Enter) to start the setup process. If the
values are not correct, enter no to go back and make changes or to exit the setup.
   Meta-data Backups
     Meta-data will be backed up every day at 11:20.
     The following volumes will be used for the backup :
VPD83T3:6000097000019260171453303646423,
VPD83T3:6000097000019260171453303646423
 Would you like to run the setup process now? [yes]: yes
```

Use the ls /clusters/cluster-2/system-volumes/ command to display the backup meta-volumes:

```
VPlexcli:/> ls /clusters/cluster-2/system-volumes/
/clusters/cluster-2/system-volumes:
```

```
Detroit_LOGGING_VOL_vol Detroit_METAVolume1 Detroit_METAVolume1_backup_2010Dec23_052818
Detroit_METAVolume1_backup_2011Jan16_211344
```

See also

- configuration remote-clusters clear-addresses
- configuration show-meta-volume-candidates
- configuration system-setup

configuration show-meta-volume-candidates

Display the volumes which meet the criteria for a metro node meta volume.

Contexts

All contexts.

Syntax

```
configuration show-meta-volume-candidates
```

Description

Candidate volumes are:

- Unclaimed
- At least 78 GB capacityIf

⚠ **CAUTION: If you configure the meta volume on a CLARiiON® array, do not configure the meta volume on the vault drives of the CLARiiON.**

Dell EMC recommends the following for meta volumes:

- Read caching should be enabled
- A hot spare meta volume be pre-configured in case of a catastrophic failure of the active meta volume.

Performance is not critical for meta volumes. The minimum performance allowed is 40 MB/s and 100 4 K IOP/second. Isolate the physical spindles for meta volumes from application workloads.

Availability IS critical for meta volumes. Best practice is to mirror the meta volume across two or more back-end arrays. Choose the arrays used to mirror the meta volume such that they are not required to migrate at the same time.

Examples

Show meta volume candidates:

```
VPlexcli:/> configuration show-meta-volume-candidates
Name                                    Capacity  Vendor    IO Status  Type
Array Name
--------------------------------------- --------- --------- ---------- -----------
--------------------
VPD83T3:6006048000019010054753303036453 187G      EMC       alive      traditional
EMC-SYMMETRIX-190100547
VPD83T3:6000097000019260170753303133313 98.5G     EMC       alive      traditional
EMC-SYMMETRIX-192601707
VPD83T3:6000097000019260170753303133313 98.5G     EMC       alive      traditional
EMC-SYMMETRIX-192601707
VPD83T3:6000097000019260170753303133313 98.5G     EMC       alive      traditional
EMC-SYMMETRIX-192601707
```

```
VPD83T3:600009700000192601707533031333135    98.5G         EMC         alive       traditional
EMC-SYMMETRIX-192601707
VPD83T3:600009700000192601707533031333136    98.5G         EMC         alive       traditional
EMC-SYMMETRIX-192601707
VPD83T3:600009700000192601707533031333137    98.5G         EMC         alive       traditional
EMC-SYMMETRIX-192601707
VPD83T3:600009700000192601707533031333138    98.5G         EMC         alive       traditional
EMC-SYMMETRIX-192601707
VPD83T3:6006016049e02100442c66c8890ee011     80G           DGC         alive       traditional
EMC-CLARiiON-FNM00083800068
The log summary for configuration automation has been captured in /var/log/VPlex/cli/
VPlexconfig.log
The task summary and the commands executed for each automation task has been captured in
/var/log/VPlex/cli/VPlexcommands.txt
The output for configuration automation has been captured in /var/log/VPlex/cli/capture/
VPlexconfiguration-session.txt
VPlexcli:/>
```

See also

- `meta-volume create`
- `configuration metadata-backup`
- `configuration system-setup`

configuration upgrade-meta-slot-count

Upgrades the slot count of the active meta volume at the given cluster to 64,000 slots.

Context

```
/clusters/cluster/system-volumes
```

Syntax

```
configuration upgrade-meta-slot-count
```

[-c | --cluster=] *cluster*

[-d | --storage-volumes=*volume* [*volume, ...*]

[-h | --help]

[--verbose]

[-f | --force]

Arguments

Optional arguments	Description
`[-h	--help]`	Displays the usage for this command.
`[--verbose]`	Provides more output during command execution.
`[-c	--cluster=]` *cluster*	The cluster at which to upgrade the slot count of the active meta volume. When specified from within a /clusters/cluster context, the value of that context is used as cluster. The -c or --cluster argument is positional.

`[-d | --storage-` `volumes=` *volume* [, *volume* ...]	Creates a temporary meta volume from one or more storage volumes. After the command completes successfully, the command destroys the temporary meta volume. The specified storage volumes must not be empty, and must be at the implied or specified cluster. Type the system IDs for the storage volumes separated by commas. Specify two or more storage volumes. Storage volumes should be on different arrays.
`[-f | --force]`	Forces the upgrade to proceed without asking for confirmation.

Description

On the metadata volume, each slot stores header information for each storage volume, extent, and logging volume. This command upgrades the slot count of the active meta volume at the given cluster to 64,000 slots.

By default, the oldest meta volume backup at the cluster serves as a temporary meta volume.

If you specify the `-d` or `--storage-volume` option, then the command creates the temporary meta volume from scratch from those disks. The temporary meta volume is active while the currently-active meta volume is being upgraded. At the end of the process, metro node reactivates the original meta volume and the temporary meta volume becomes a backup again. Metro node renames the backup to reflect the new point in time at which it became a backup.

Meta-volumes differ from standard storage volumes in the following ways:

- Create a meta volume from a volum that is not yet claimed.
- Create meta volumes directly on storage volumes, not extents.

    If you configure the meta-volume on a CLARiiON array, do not place the meta volume on the vault drives of the CLARiiON.

- Performance is not critical for meta-volumes. The minimum performance allowed is 40MB/sec and 1004KIOP/second.
- Isolate the physical spindles for meta-volumes from application workloads.

Dell EMC recommends the following for meta-volumes:

- Enable read caching
- Pre-configure a hot spare meta-volume in case of a catastrophic failure of the active meta-volume.
- Minimum of 78GB.
- Minimum of 20GB.

If you specify two or more storage-volumes, configure them on two separate arrays if more than one array is present. This command creates a RAID-1 of all the storage-volumes.

connectivity director

Displays connections from the specified director through data (non-management) ports.

Contexts

All contexts.

Syntax

```
connectivity director director
[-d|--storage-volumes]
[-i|--initiators]
[-n|--directors]
[-f|--file] filename
[-s|sort-by][name|wwn|port]
```

Arguments

Required arguments	Description
director	Director to discover.
Optional arguments	Description
`[-d|--storage-volumes]`	Display connectivity from the specified director to storage volumes.
`[-i|--initiators]`	Display connectivity from the specified director to initiators.
`[-n|--directors]`	Display connectivity from the specified director to other directors.
`[-f|--file]` *filename*	Save the output in the specified file. Default: /var/log/VPlex/cli
`[-s|--sort-by] {name|wwn|port}`	Sort output by one of the following: ● `name` - Sort output by storage volume name. ● `wwn` - Sort output by WorldWide name. ● `port` - Sort output by port.

Description

Prints a table of discovered storage volumes, initiators and directors. Lists the ports on which it discovered each storage volume, initiator and director.

See also

● `connectivity show`
● `connectivity validate-be`

connectivity list all

Displays the initiators, storage volumes, directors, and the targets connected to a director.

Contexts

```
/: connectivity list all
/clusters/*/directors/*/: list all
```

Syntax

```
connectivity list all
[-h| --help]
[--verbose]
[-n| --directors]context path, context path...
[-f| ] filename
[-d| ]
[-i| ]
[-v| ]
[-t| ]
[-s| --sort-by]key
```

Arguments

Optional arguments	Description
`[-h	--help]`	Displays the usage for this command
`[--verbose]`	Provides additional output during command execution. This may not have any effect for some commands.
`[-n	--directors]` *context path , context path ...*	Source director(s) for which connectivity should be reported.
`[-f	--file]` *filename*	Writes the connectivity report to the named file instead of echoing it. If the file exists, any previous contents will be lost.
`[-d	--show-directors]`	Shows inter-director connectivity.
`[-i	--show-initiators]`	Shows connected initiators.
`[-v	--show-storage-volumes]`	Shows connected storage volumes.
`[-t	--show-targets]`	Shows connected targets.
`[-s	--sort-by]` *key*	The field by which to sort the storage volume information (name, wwn or port).

Description

Use this command to list the directors, initiators, storage volumes, and the targets that are connected to a director. Reports the results of the `connectivity list storage-volumes`, `connectivity list initiators`, and the `connectivity list directors` commands for each specified director. Unless you specify `-d`, `-i`, or `-v`, all three categories are reported. The reports are ordered by director, not by report category.

See also

- `connectivity list directors`
- `connectivity list initiators`
- `connectivity list storage-volumes`

connectivity list directors

Displays the inter-director connections for a director.

Contexts

```
/: connectivity list directors
/clusters/*/directors/*/: list directors
```

Syntax

```
connectivity list directors
[-h| --help]
[--verbose]
[-n| --directors]context path, context path...
[-f| ] filename
```

```
[-u|  ] uuid
```

Arguments

Optional arguments	Description
`[-h	--help]`	Displays the usage for this command
`[--verbose]`	Provides additional output during command execution. This may not have any effect for some commands.
`[-n	--directors]` *context path , context path ...*	Source director(s) for which connectivity should be reported.
`[-f	--file]` *filename*	Writes the connectivity report to the named file instead of echoing it. If the file exists, any previous contents will be lost. You can write the output to a file using an absolute path, or using a path relative to the CLI directory.
`[-d	--uuid]`	Lists the connected directors by UUID instead of by name.

Description

Lists the other directors that are connected to the specified directors. The list includes the address, protocol, and local port name by which each remote director is connected to the specified directors.

See also

- `connectivity list all`
- `connectivity list initiators`
- `connectivity list storage-volumes`

connectivity list initiators

Displays the initiators connected to directors.

Contexts

```
/: connectivity list initiators
/clusters/*/directors/*/: list initiators
```

Syntax

```
connectivity list directors
[-h| --help]
[--verbose]
[-n| --directors]context path, context path...
[-f| ] filename
```

Arguments

Optional arguments	Description

`[-h | --help]`	Displays the usage for this command
`[--verbose]`	Provides additional output during command execution. This may not have any effect for some commands.
`[-n | --directors]` *context path , context path ...*	Source director(s) for which connectivity should be reported.
`[-f | --file]` *filename*	Writes the connectivity report to the named file instead of echoing it. If the file exists, any previous contents will be lost. You can write the output to a file using an absolute path, or using a path relative to the CLI directory.
`[-d | --uuid]`	Lists the connected directors by UUID instead of by name.

Description

Lists the initiators that are connected to a director. For each director specified, the list includes a table that reports each initiator's port WWN (FC initiators only) and node WWN (FC) or IQN (iSCSI), and to which port on the director they are connected.

See also

- `connectivity list all`
- `connectivity list directors`
- `connectivity list storage-volumes`

connectivity list storage-volumes

Displays the storage volumes connected to directors.

Contexts

```
/: connectivity list storage-volumes
/clusters/*/directors/*/: list storage-volumes
```

Syntax

```
connectivity list directors
[-h | --help]
[--verbose]
[-n | --directors]context path, context path...
[-f | ] filename
[-s | --sort-by] key
[-l | --long-luns]
```

Arguments

Optional arguments	Description
`[-h | --help]`	Displays the usage for this command

`[--verbose]`	Provides additional output during command execution. This may not have any effect for some commands.
`[-n	--directors]` *context path , context path ...*	Source director(s) for which connectivity should be reported.
`[-f	--file]` *filename*	Writes the connectivity report to the named file instead of echoing it. If the file exists, any previous contents will be lost. You can write the output to a file by using an absolute path, or by using a path relative to the CLI directory.
`[-s	--sort-by]` *key*	The field by which to sort the storage volume information (name, wwn or port).
`[-l	--long-luns]`	Display LUNs as 16-digit hex-strings instead of as integers.

Description

Lists the storage volumes connected to a director. For each director, the list includes the address, protocol, and local port name by which each remote director is connected to the specified directors.

See also

- `connectivity list all`
- `connectivity list directors`
- `connectivity list initiators`

connectivity show

Displays the communication endpoints that can see each other.

Contexts

All contexts.

Syntax

```
connectivity show
[-p|--protocol[fc|ib|tcp|udp]
[e|--endpoints] port, port,...
```

Arguments

Optional arguments	Description
`[-p|--protocol] {ib|tcp|udp} [-p|--protocol] {fc|ib| tcp|udp}`	Display endpoints with only the specified protocol. Arguments are case-sensitive, and include: - `fc` - Fibre Channel. - `ib` - InfiniBand. Not supported in the current release. Use the connectivity director command to display IB protocol connectivity. - `tcp` - Transmission Control Protocol. - `udp` - UDP-based Data Transfer Protocol.
`[-e|--endpoints]` *port,port...*	List of one or more ports for which to display endpoints. Entries must be separated by commas. Default: Display endpoints for all ports.

Description

Displays connectivity, but does not perform connectivity checks. Displays which ports can talk to each other.

See also

● `connectivity director`

connectivity validate-be

Checks that the back-end connectivity is correctly configured.

Contexts

All contexts.

Syntax

```
connectivity validate-be
[-d | --detailed]
[-h | --help]
--verbose
```

Arguments

Optional arguments	Description
`[-h	--help]`	Displays the usage for this command.
`[-d| --detailed]`	Details are displayed first, followed by the summary.
`--verbose`	Provides more output during command execution. This may not have any effect for some commands.

Description

This provides a summary analysis of the back-end connectivity information displayed by connectivity director if connectivity director was executed for every director in the system. It checks the following:

● All directors see the same set of storage volumes.
● All directors have at least two paths to each storage-volume.
● The number of active paths from each director to a storage volume does not exceed 4.
  ⓘ **NOTE:** If the number of paths per storage volume per director exceeds 8 a warning event, but not a call home is generated. If the number of paths exceeds 16, an error event and a call-home notification are generated.

If the connectivity director command is run for every director in the metro node prior to running this command, this command displays an analysis/summary of the back-end connectivity information.

Examples

Entering the `connectivity validate-be` command without any arguments provides a summary output as shown.

```
VPlexcli:/> connectivity validate-be
Cluster cluster-1
```

```
0 storage-volumes which are dead or unreachable.
0 storage-volumes which do not meet the high availability requirement for storage volume
paths*.
0 storage-volumes which are not visible from all directors.
0 storage-volumes which have more than supported (4) active paths from same director.
*To meet the high availability requirement for storage volume paths each storage volume
must be accessible from each of the directors through 2 or more metro node backend
ports, and 2 or more Array target ports, and there should be 2 or more ITLs.

Cluster cluster-2
0 storage-volumes which are dead or unreachable.
0 storage-volumes which do not meet the high availability requirement for storage volume
paths*.
5019 storage-volumes which are not visible from all directors.
0 storage-volumes which have more than supported (4) active paths from same director.
*To meet the high availability requirement for storage volume paths each storage volume
must be accessible from each of the directors through 2 or more metro node backend
ports, and 2 or more Array target ports, and there should be 2 or more ITLs.
```

Display a summarized validation for back-end connectivity on an unhealthy system:

```
VPlexcli:/> connectivity validate-be
Summary
Cluster cluster-1
0 storage-volumes which are dead or unreachable.
0 storage-volumes which do not meet the high availability requirement for storage volume
paths*.
0 storage-volumes which are not visible from all directors.
0 storage-volumes which have more than supported (4) active paths from same director.
*To meet the high availability requirement for storage volume paths each storage volume
must be accessible from each of the directors through 2 or more metro node backend
ports, and 2 or more Array target ports, and there should be 2 or more ITLs.
Cluster cluster-2
0 storage-volumes which are dead or unreachable.
0 storage-volumes which do not meet the high availability requirement for storage volume
paths*.
5019 storage-volumes which are not visible from all directors.
0 storage-volumes which have more than supported (4) active paths from same director.
*To meet the high availability requirement for storage volume paths each storage volume
must be accessible from each of the directors through 2 or more metro node backend
ports, and 2 or more Array target ports, and there should be 2 or more ITLs.
```

Display detailed validation for back-end connectivity on an unhealthy system:

```
VPlexcli:/> connectivity validate-be -d

Storage volumes that are not visible at all directors:

Cluster Director Storage Volumes Director Cannot See
--------- -------------- ---------------------------------------
cluster-2 director-2-1-A VPD83T3:60001440000000103017bf5045090d75
VPD83T3:60001440000000103017bf5045090d70
VPD83T3:60001440000000103017bf5045092306
VPD83T3:60001440000000103017bf5045092f3b
VPD83T3:60001440000000103017bf5045092301
...
...
VPD83T3:6006016099751d002267f6538576e011
VPD83T3:60001440000000103017bf5045092310
VPD83T3:60001440000000103017bf5045090d6b
VPD83T3:60001440000000103017bf5045092f59
VPD83T3:60001440000000103017bf5045092f54
Summary
Cluster cluster-1
0 storage-volumes which are dead or unreachable.
0 storage-volumes which do not meet the high availability requirement for storage volume
paths*.
0 storage-volumes which are not visible from all directors.
0 storage-volumes which have more than supported (4) active paths from same director.
*To meet the high availability requirement for storage volume paths each storage volume
must be accessible from each of the directors through 2 or more metro node backend
ports, and 2 or more Array target ports, and there should be 2 or more ITLs.
```

```
Cluster cluster-2
0 storage-volumes which are dead or unreachable.
0 storage-volumes which do not meet the high availability requirement for storage volume
paths*.
5019 storage-volumes which are not visible from all directors.
0 storage-volumes which have more than supported (4) active paths from same director.
*To meet the high availability requirement for storage volume paths each storage volume
must be accessible from each of the directors through 2 or more metro node backend
ports, and 2 or more Array target ports, and there should be 2 or more ITLs.
```

See also

- connectivity director
- connectivity show
- connectivity validate-local-com
- connectivity validate-wan-com
- health-check
- validate-system-configuration

connectivity validate-local-com

Validates that the actual connectivity over local-com matches the expected connectivity.

Contexts

All contexts.

Syntax

```
connectivity validate-local-com
[-c|--cluster] context path
[-e|--show-expected]
[-p|--protocol] communication protocol
[-h|--help]
[--verbose]
```

Arguments

Optional arguments	Description
[-c|--cluster] *context-path*	path of the cluster where local-com should be validated.
[-e|--show-expected]	Prints the expected connectivity map instead of comparing it to the actual connectivity.
[-p|--protocol] *communication-protocol*	Specifies the protocol used for local-com (Fibre Channel or UDP). If not specified, the command attempts to determine the protocol based on the local-com ports in the system.
[-h|--help]	Displays command line help.
[--verbose]	Provides more output during command execution. This may not have any effect for some commands.

Description

Verifies the expected local-com connectivity. This command assembles a list of expected local-com connectivity, compares it to the actual local-com connectivity, and reports any missing or extra connections. This command verifies only IP- or Fibre Channel-based local-com connectivity.

Expected connectivity is determined by collecting all ports whose role is local-com and verifying that each port in a port-group has connectivity to every other port in the same port-group.

When both Fibre Channel and IP ports with role local-com are present, the smaller subset is discarded and the protocol of the remaining ports is assumed to be the correct protocol.

See also

- `connectivity director`
- `connectivity show`
- `connectivity validate-be`
- `connectivity validate-wan-com`
- `health-check`
- `validate-system-configuration`

consistency-group add-virtual-volumes

Adds one or more virtual volume to a consistency group.

Contexts

All contexts.

In `/clusters/cluster-n/consistency-groups/`*group-name* context, command is `add-virtual-volumes`

Syntax

```
consistency-group add-virtual-volumes
```

`[-v|--virtual-volumes]` *virtual-volume, virtual-volume, ...*

`[-g|--consistency-group]` *consistency-group*

Arguments

Required arguments	
`[-v|--virtual-volumes]` *virtual-volume, virtual-volume,...*	* List of one or more comma-separated glob patterns or context paths of the virtual volume to add.
`[-g|--consistency-group]` *consistency-group*	* Context path of the consistency group to which to add the specified virtual volume. If the current context is a consistency-group or below, then that consistency group is the default. Otherwise, this argument is required.

* - argument is positional.

Description

Adds the specified virtual volume to a consistency group. The properties of the consistency group immediately apply to the added volume.

(i) **NOTE:** Only volumes with `visibility` and `storage-at-cluster` properties which match those of the consistency group can be added to the consistency group.

Additionally, you cannot add a virtual volume to a consistency group if the initialization status of the virtual volume is `failed` or `in-progress`.

Maximum # of volumes in a consistency group: 1000

All volumes used by the same application and/or same host should be grouped together in a consistency group.

If any of the specified volumes are already in the consistency group, the command skips those volumes, but prints a warning message for each one.

Examples

Add multiple volumes using a single command. Separate virtual volume by commas:

In the following example:

- The `cd` command changes the context to the target consistency group.
- The `consistency-group list-eligible-virtual-volumes` command displays virtual volumes that are eligible to be added to the consistency group.
- The `consistency-group add-virtual-volumes` command adds the specified virtual volume to the consistency group.
- The `ls` command in displays the change:

```
VPlexcli:/> cd /clusters/cluster-1/consistency-groups/TestCG
VPlexcli:/clusters/cluster-1/consistency-groups/TestCG> consistency-group list-eligible-
virtual-volumes
[TestDDevice-1_vol, TestDDevice-2_vol, TestDDevice-3_vol, TestDDevice-4_vol,
TestDDevice-5_vol]
VPlexcli:/clusters/cluster-2/consistency-groups/TestCG> add-virtual-volumes --virtual-
volumes TestDDevice-2_vol
VPlexcli:/clusters/cluster-1/consistency-groups/TestCG> add-virtual-volumes
TestDDevice-1_vol,TestDDevice-2_vol
VPlexcli:/clusters/cluster-1/consistency-groups/TestCG> ll
Attributes:
Name                 Value
------------------   -----------------------------------------------------------
active-clusters      []
cache-mode           synchronous
detach-rule          active-cluster-wins
operational-status   [(cluster-1,{ summary:: ok, details:: [] }), (cluster-2,{
                     summary:: ok, details:: [] })]
passive-clusters     [cluster-1, cluster-2]
read-only            false
storage-at-clusters  [cluster-1, cluster-2]
virtual-volumes      [TestDDevice-1_vol, TestDDevice-2_vol]
visibility           [cluster-1, cluster-2]
Contexts:
Name          Description
-----------   -----------
advanced      -
```

See also

- `consistency-group create`
- `consistency-group list-eligible-virtual-volumes`
- `consistency-group remove-virtual-volumes`
- *Dell EMC Administration Guide for metro node*

consistency-group choose-winner

Selects a winning cluster during an inter-cluster link failure.

Contexts

All contexts.

In `/clusters/cluster-n/consistency-groups/`*`group-name`* context, command is `choose winner`.

Syntax

```
consistency-group choose-winner
```
[-c|--cluster] *cluster*

[-g|--consistency-group] *consistency-group*

[-f|--force]

Arguments

Required arguments	
`[-c|--cluster]` *cluster*	*The cluster on which to roll back and resume I/O.
`[-g|--consistency-group]` `consistency-group`	* Context path of the consistency group on which to roll back and resume I/O.
Optional arguments	
`[-f|--force]`	Do not prompt for confirmation. Allows this command to be run using a non-interactive script.

* - argument is positional.

Description

Use the choose-winner command when:

● I/O must be resumed on a cluster during a link outage
● The selected cluster has not yet detached its peer
● The detach-rules require manual intervention

The selected cluster will detach its peer cluster and resume I/O.

⚠ **CAUTION: When the clusters cannot communicate, it is possible to use this command to select both clusters as the winning cluster (conflicting detach). In a conflicting detach, both clusters resume I/O independently.**

When the inter-cluster link heals in such a situation, manual intervention is required to pick a winning cluster. The data image of the winning cluster will be used to make the clusters consistent again. Any changes at the losing cluster during the link outage are discarded.

Do not use this command to specify more than one cluster as the winner.

Examples

Select cluster-2 as the winner for consistency group TestCG:

```
VPlexcli:/clusters/cluster-2/consistency-groups/TestCG> choose-winner --cluster cluster-2
WARNING: This can cause data divergence and lead to data loss. Ensure the other cluster
is not serving I/O for this consistency group before continuing. Continue? (Yes/No) Yes
```

In the following example:

- I The two `ls` commands show a consistency group my_cg1 when an inter-cluster link outage has occurred. The detach-rule is `no-automatic-winner`, so I/O stops at both clusters, the status summary is `suspended` (showing that I/O has stopped), and the status details contain `cluster-departure`, indicating that I/O has stopped because the clusters can no longer communicate with one another.
- The `choose winner` command forces cluster-1 to detach cluster-2.
- The `ls` command displays the change at cluster-1.
  - Cluster-1 status is `suspended`.
  - Cluster-2, is still `suspended`, cluster-departure.
  - Cluster-1 is the winner, so it `detached` cluster-2.
- I/O at cluster-1 remains suspended, waiting for the administrator.

```
VPlexcli:/> ll /clusters/cluster-2/consistency-groups/
my_cg1/


/clusters/cluster-2/consistency-groups/my_cg1:

Attributes:
Name                 Value
-------------------  -------------------------------------------------------
active-clusters      []
cache-mode           synchronous
detach-rule          no-automatic-winner
operational-status   [(cluster-1,{ summary:: suspended, details::
                     [cluster-departure, rebuilding-across-clusters,
                     restore-link-or-choose-winner] }), (cluster-2,{ summary::
                     suspended, details:: [cluster-departure,
                     restore-link-or-choose-winner] })]
passive-clusters     []
read-only            false
storage-at-clusters  []
virtual-volumes      [dr1_read_write_latency_0000_12_vol]
visibility           [cluster-1, cluster-2]


Contexts:
Name         Description
-----------  -----------
advanced     -

VPlexcli:/clusters/cluster-2/consistency-groups/my_cg1> choose-winner -c
cluster-2


WARNING: This can cause data divergence and lead to data loss. Ensure the other cluster
is not serving I/O for this consistency group before continuing. Continue? (Yes/No) yes

VPlexcli:/clusters/cluster-2/consistency-groups/my_cg1>
ls


Attributes:
Name                 Value
-------------------  -------------------------------------------------------
active-clusters      []
cache-mode           synchronous
detach-rule          no-automatic-winner
operational-status   [(cluster-1,{ summary:: suspended, details::
                     [cluster-departure, rebuilding-across-clusters] }),
```

```
                            (cluster-2,{ summary:: ok, details:: [] })]
passive-clusters         []
read-only                false
storage-at-clusters      []
virtual-volumes          [dr1_read_write_latency_0000_12_vol]
visibility               [cluster-1, cluster-2]


Contexts:
advanced
```

See also

- `consistency-group resume-at-loser`
- `consistency-group summary`
- *Dell EMC Administration Guide for metro node*

consistency-group convert-to-local

Converts a distributed consistency group to a local consistency group.

context

All contexts

Syntax

```
convert-to-local
   [-h | --help]
   [--verbose]
   [[-c | --cluster=]cluster-context]
   [-f | --force]
   [[-g | --consistency-group=]consistency-group]
```

Arguments

Optional arguments	
`-h|--help`	Displays the usage for this command.
`--verbose`	Provides more output during command execution. This may not have any effect for some commands.
`-c|--cluster=` *cluster context*	Specifies the cluster where all devices in the consistency group will be local.
`-f|--force`	Forces the command to proceed, bypassing all user warnings .
`-g|--consistency-group=`*consistency-group*	Specifies the consistency-group to make local.

Description

To convert a distributed consistency group to a local consistency group, this command converts all distributed devices under each virtual volume to local distributed devices. The legs on the specified cluster become the supporting device of the virtual volumes. All target devices should not be migration temporary devices and should not be exported to any other cluster.

consistency-group create

Creates and names an empty consistency group.

Contexts

All contexts.

In `/clusters/cluster-n/consistency-groups/group-name` context, command is `create`.

Syntax

`consistency-group create`

`[-n|--name]` *consistency-group name*

`[-c|--cluster]` *cluster*

Arguments

Required arguments	
`[-n|--name]` *consistency-group name*	* Name of the new consistency group. Must be unique within a cluster. Name conflicts across s can be resolved by changing the name later using the `set name` command.
`[-c|--cluster]` *cluster*	Context path of the at which to create the consistency group. If the current context is a cluster or below, that is the default. Otherwise, this argument is required.

* - argument is positional.

Description

Creates and names an empty consistency group.

A maximum of 1024 consistency groups can be configured.

Each consistency group can contain up to 1000 .

All consistency groups have configurable properties that determine I/O behavior, including:

- `cache mode` - synchronous
- visibility - determines which s know about a consistency group. Default is only to the where the consistency group was created. Modified using the set command.
- `storage-at-clusters` - tells metro node at which the physical storage associated with a consistency group is located. Modified using the `set` command.
- `local-read-override` - whether the volumes in this consistency group use the local read override optimization. Default is true. Modified using the `set` command.
- `detach-rule` - determines the winning when there is an inter- link outage. Modified using the `consistency-group set-detach-rule active-cluster-wins`, `consistency-group set-detach-rule no-automatic-winner`, and `consistency-group set-detach-rule winner commands`.
- `auto-resume-at-loser` - whether the loser automatically resumes I/O when the inter- link is repaired after a failure. Default is true. Modified using the `set` command in `/clusters/cluster-n/consistency-groups/consistency-group-name/advanced` context.
- `virtual-volumes` - member volumes of the consistency group. Modified using the `consistency-group add-virtual-volumes` and `consistency-group remove-virtual-volumes` commands.

Refer to the *Dell EMC Administration Guide* for more information about the consistency group properties.

Examples

In the following example,

- The `ls /clusters/*/consistency-groups/` command displays the names of all consistency groups in both s.
- The `consistency-group create` command creates an empty synchronous consistency group `TestCG`.
- The `ls` command in consistency group context displays the new name. The `ls TestCG` command displays details about the new consistency group.

ⓘ **NOTE:** See the *Dell EMC Administration Guide for metro node* for a description of the fields in the following examples.

```
VPlexcli:/> ls /clusters/*/consistency-groups/
/clusters/cluster-1/consistency-groups:
test10   test11        test12       test13      test14
test15   test16        test5        test6       test7       test8
test9    vs_RAM_c1wins vs_RAM_c2wins vs_oban005  vs_sun190
/clusters/cluster-2/consistency-groups:
.
.
.
VPlexcli:/> cd /clusters/cluster-1/consistency-groups/
VPlexcli:/clusters/cluster-1/consistency-groups> consistency-group create --name TestCG
--cluster cluster-1
VPlexcli:/clusters/cluster-1/consistency-groups> ls
TestCG       test10       test11   test12        test13
test14       test15       test16   test5         test6
test7        test8        test9    vs_RAM_c1wins  vs_RAM_c2wins
vs_oban005   vs_sun190
VPlexcli:/clusters/cluster-1/consistency-groups> ls TestCG
/clusters/cluster-1/consistency-groups/TestCG:
Attributes:
Name                 Value
------------------   ------------------------------------------
active-clusters      []
cache-mode           synchronous
detach-rule          -
operational-status   [(cluster-1,{ summary:: ok, details:: [] })]
passive-clusters     []
storage-at-clusters  []
virtual-volumes      []
visibility           [cluster-1]
Contexts:
advanced
```

See also

- `consistency-group add-virtual-volumes`
- `consistency-group destroy`
- `consistency-group remove-virtual-volumes`
- *Dell EMC Administration Guide for metro node*

consistency-group destroy

Destroys the specified empty consistency groups.

Context

All contexts.

In `/clusters/cluster-n/consistency-groups/group-name` context, command is `destroy`.

Syntax

```
consistency-group destroy
[-g|--consistency-group] consistency-group, consistency-group, ...
--force
```

Arguments

Required arguments	
`[-g|--consistency-group]` consistency-group, consistency-group, ...	* List of one or more comma-separated context paths of the consistency groups to destroy.
Optional arguments	
`[-f|--force]`	Force the operation to continue without confirmation. Allows this command to be run using a non-interactive script.

* - argument is positional.

Description

Destroys the specified consistency groups.

All clusters where the consistency group is visible must be operational in order for the consistency group to be destroyed.

All clusters where the consistency group has storage-at-clusters must be operational in order for the consistency group to be destroyed.

Examples

Destroy the specified consistency group:

```
VPlexcli:/clusters/cluster-1/consistency-groups> destroy TestCG
WARNING: The following items will be destroyed:
Context
--------------------------------------------
/clusters/cluster-1/consistency-groups/TestCG
Do you wish to proceed? (Yes/No)
```

See also

- `consistency-group create`
- `consistency-group remove-virtual-volumes`
- *Dell EMC Administration Guide for metro node*

consistency-group list-eligible-virtual-volumes

Displays the virtual volumes that are eligible to be added to a specified consistency group.

Contexts

All contexts.

Syntax

```
consistency-group list-eligible-volumes

[-g|consistency-group] consistency-group
```

Arguments

Required arguments	
`[-g|--consistency-group]` *consistency-group*	The consistency group for which the eligible virtual volumes shall be listed. If the current context is a consistency group or is below a consistency group, that consistency group is the default. Otherwise, this argument is required.

Description

Displays eligible virtual volumes that can be added to a consistency group. Eligible virtual volumes:

- Must not be a logging volume
- Have storage at every cluster in the `storage-at-clusters` property of the target consistency group
- Are not members of any other consistency group
- Have no properties (detach rules, auto-resume) that conflict with those of the consistency group. That is, detach and resume properties of either the virtual volume or the consistency group must not be set.
- Have the initialization status as `sucess`.

Examples

List eligible virtual volumes from the target consistency group context:

```
VPlexcli:/clusters/cluster-1/consistency-groups/TestCG2> list-eligible-virtual-volumes
[dr1_C12_0000_vol, dr1_C12_0001_vol, dr1_C12_0002_vol, dr1_C12_0003_vol,
dr1_C12_0004_vol, dr1_C12_0005_vol, dr1_C12_0006_vol, dr1_C12_0007_vol,
dr1_C12_0008_vol, dr1_C12_0009_vol, dr1_C12_0010_vol, dr1_C12_0011_vol,
dr1_C12_0012_vol, dr1_C12_0013_vol, dr1_C12_0014_vol, dr1_C12_0015_vol,
dgc_p2z_test_vol, vmax_DR1_C1_r1_0000_12_vol, vmax_DR1_C1_r0_0000_12_vol,
.
.
.
```

List eligible virtual volumes from the root context:

```
VPlexcli:/> consistency-group list-eligible-virtual-volumes /clusters/cluster-1/
consistency-groups/TestCG2
[dr1_C12_0000_vol, dr1_C12_0001_vol, dr1_C12_0002_vol,dr1_C12_0003_vol, dr1_C12_0004_vol,
.
.
.
```

See also

- `consistency-group add-virtual-volumes`
- `consistency-group remove-virtual-volumes`
- `consistency-group summary`
- *Dell EMC Administration Guide for metro node*

consistency-group remove-virtual-volumes

Removes one or more virtual volumes from the consistency group.

Contexts

All contexts.

In `/clusters/cluster-n/consistency-groups/`*group-name* context, command is `remove-virtual-volumes`.

Syntax

```
consistency-group remove-virtual-volumes
[-v|--virtual-volumes] virtual-volume, virtual-volume, ...
[-g|--consistency-group] context path
--force
```

Arguments

Required arguments	
`[-v|--virtual-volumes]` *virtual-volume,virtual-volume,...*	*Glob pattern or a list of one or more comma-separated context paths of the virtual volumes to remove from the consistency group.
`[-g|--consistency-group]` *context path*	*Context path of the consistency group from which to remove the specified virtual volume. If the current context is a consistency-group or is below, then that consistency group is the default. Otherwise, this argument is required.
`--force`	Do not ask for confirmation. Allows this command to be run using a non-interactive script.

* - argument is positional.

Description

Removes one or more virtual volumes from the consistency group.

If the pattern given to `--virtual-volumes` argument matches volumes that are not in the consistency group, the command skips those volumes, and prints a warning message for each one.

Best practice is to either:

- Remove the volumes from the view, or
- Perform the operation when I/O loads are light.

Use the `--force` argument to suppress the request for confirmation.

Examples

In the following example:

- The `ls` command displays the virtual volumes in consistency group TestCG.
- The `consistency-group remove-virtual-volumes` command removes a specified volume from the consistency group.
- The `ls` command displays the change.

```
VPlexcli:/> ls /clusters/cluster-1/consistency-groups/TestCG
/clusters/cluster-1/consistency-groups/TestCG:
```

```
----------------------------    ----------------------------------------------
.
.
.
virtual-volumes                 [dr1_C12_0919_vol, dr1_C12_0920_vol,
                                dr1_C12_0921_vol, dr1_C12_0922_vol]
visibility                      [cluster-1, cluster-2]
.
.
.
VPlexcli:/> consistency-group remove-virtual-volumes /clusters/cluster-1/virtual-volumes/
dr1_C12_0920_vol --consistency-group /clusters/cluster-1/consistency-groups/TestCG
VPlexcli:/> ls /clusters/cluster-1/consistency-groups/TestCG
/clusters/cluster-1/consistency-groups/TestCG:
Name                            Value
----------------------------    ----------------------------------------------
.
.
.
storage-at-clusters             [cluster-1, cluster-2]
synchronous-on-director-failure -
virtual-volumes                 [dr1_C12_0919_vol, dr1_C12_0921_vol,
                                dr1_C12_0922_vol]
.
.
.
```

See also

- consistency-group create
- consistency-group destroy
- *Dell EMC Administration Guide for metro node*

consistency-group resolve-conflicting-detach

Select a winning cluster on a consistency group on which there has been a conflicting detach.

Contexts

All contexts.

In /clusters/cluster-n/consistency-groups/*group-name* context, command is resolve-conflicting-detach.

Syntax

```
consistency-group resolve-conflicting-detach
[-c|--cluster] cluster
[-g|--consistency-group consistency-group
[-f|--force]
```

Arguments

Required arguments

[-c|--cluster] cluster - * The cluster whose data image will be used as the source for resynchronizing the data images on both clusters.

[-g|--consistency-group] consistency-group - * The consistency group on which to resolve the conflicting detach.

Optional arguments

[-f|--force] - Do not prompt for confirmation. Allows this command to be run using a non-interactive script.

* - argument is positional.

Description

⚠️ **CAUTION: This command results in data loss at the losing cluster.**

During an inter-cluster link failure, an administrator may permit I/O to continue at both clusters. When I/O continues at both clusters:

- The data images at the clusters diverge.
- Legs of distributed volumes are logically separate.

When the inter-cluster link is restored, the clusters learn that I/O has proceeded independently.

I/O continues at both clusters until the administrator picks a *winning* cluster whose data image will be used as the source to synchronize the data images.

Use this command to pick the winning cluster. For the distributed volumes in the consistency group:

- I/O at the *losing* cluster is suspended (there is an impending data change)
- The administrator stops applications running at the losing cluster.
- Any dirty cache data at the losing cluster is discarded
- The legs of distributed volumes rebuild, using the legs at the winning cluster as the rebuild source.

When the applications at the losing cluster are shut down, use the `consistency-group resume-after-data-loss-failure` command to allow the system to service I/O at that cluster again.

Example

Select cluster-1 as the winning cluster for consistency group "TestCG" from the TestCG context:

```
VPlexcli:/clusters/cluster-1/consistency-groups/TestCG> resolve-conflicting-detach
This will cause I/O to suspend at clusters in conflict with cluster cluster-1, allowing
you to stop applications at those clusters. Continue? (Yes/No) yes
```

Select cluster-1 as the winning cluster for consistency group "TestCG" from the root context:

```
VPlexcli:/> consistency-group resolve-conflicting-detach --cluster cluster-1 --
consistency-group /clusters/cluster-1/consistency-groups/TestCG
This will cause I/O to suspend at clusters in conflict with cluster cluster-1, allowing
you to stop applications at those clusters. Continue? (Yes/No) Yes
```

In the following example, I/O has resumed at both clusters during an inter-cluster link outage. When the inter-cluster link is restored, the two clusters will come back into contact and learn that they have each detached the other and carried on I/O.

- The `ls` command shows the operational-status as `ok, requires-resolve-conflicting-detach` at both clusters.
- The `resolve-conflicting-detach` command selects cluster-1 as the winner.

  Cluster-2 will have its view of the data discarded.

  I/O is suspended on cluster-2.

- The `ls` command displays the change in operational status.
    - At cluster-1, I/O continues, and the status is `ok`.
    - At cluster-2, the view of data has changed and so I/O is suspended pending the `consistency-group resume-at-loser` command.

```
VPlexcli:/clusters/cluster-1/consistency-groups/cg1> ls
Attributes:
```

```
Name                Value
------------------  ---------------------------------------
active-clusters     [cluster-1, cluster-2]
cache-mode          synchronous
detach-rule         no-automatic-winner
operational-status  [(cluster-1,{ summary:: ok, details:: [requires-resolve-
conflicting-detach] }),
                      (cluster-2,{ summary:: ok, details:: [requires-resolve-conflicting-detach]
passive-clusters    []
read-only           false
storage-at-clusters [cluster-1, cluster-2]
virtual-volumes     [dd1_vol, dd2_vol]
visibility          [cluster-1, cluster-2]
Contexts:
advanced
VPlexcli:/clusters/cluster-1/consistency-groups/cg1> resolve-conflicting-detach -c
cluster-1
This will cause I/O to suspend at clusters in conflict with cluster cluster-1, allowing
you to stop applications at those clusters. Continue? (Yes/No) Yes
VPlexcli:/clusters/cluster-1/consistency-groups/cg1> ls
Attributes:
Name                Value
------------------  ----------------------------------------------------------
active-clusters     [cluster-1, cluster-2]
cache-mode          synchronous
detach-rule         no-automatic-winner
operational-status  [(cluster-1,{ summary:: ok, details:: [] }),
                      (cluster-2,{ summary:: suspended, details:: [requires-resume-at-
loser] })]
passive-clusters    []
read-only           false
storage-at-clusters [cluster-1, cluster-2]
virtual-volumes     [dd1_vol, dd2_vol]
visibility          [cluster-1, cluster-2]
Contexts:
advanced
```

See also

- `consistency-group resume-at-loser`
- *Dell EMC Administration Guide for metro node*

consistency-group resume-at-loser

If I/O is suspended due to a data change, resumes I/O at the specified cluster and consistency group.

Contexts

All contexts (at the losing cluster).

In `/clusters/cluster-`*n*`/consistency-groups/`*group-name* context, command is `resume-at-loser`.

Syntax

`consistency-group resume-at-loser`

`[-c|--cluster]` *cluster*

`[-s|--consistency-group]`*consistency-group*

`[-f|--force]`

Arguments

Required arguments	
`[-c|--cluster]` *cluster*	* The cluster on which to roll back and resume I/O.
`[-g|--consistency-group]` *consistency-group*	* The consistency group on which to resynchronize and resume I/O.
Optional arguments	
`[-f|--force]`	Do not prompt for confirmation. Without this argument, the command asks for confirmation to proceed. This protects against accidental use while applications are still running at the losing cluster which could cause applications to misbehave. Allows the command to be executed from a non-interactive script.

* - argument is positional.

Description

During an inter-cluster link failure, you can permit I/O to resume at one of the two clusters: the "winning" cluster.

I/O remains suspended on the "losing" cluster.

When the inter-cluster link heals, the winning and losing clusters re-connect, and the losing cluster discovers that the winning cluster has resumed I/O without it.

Unless explicitly configured otherwise (using the `auto-resume-at-loser` property), I/O remains suspended on the losing cluster. This prevents applications at the losing cluster from experiencing a spontaneous data change.

The delay allows the administrator to shut down applications.

After stopping the applications, you can use this command to:

- Resynchronize the data image on the losing cluster with the data image on the winning cluster,
- Resume servicing I/O operations.

You can then safely restart the applications at the losing cluster.

Without the `--force` option, this command asks for confirmation before proceding, since its accidental use while applications are still running at the losing cluster could cause applications to misbehave.

Examples

```
VPlexcli:/clusters/cluster-2/consistency-groups/TestCG> resume-at-loser
This may change the view of data presented to applications at cluster cluster-2. You
should first stop applications at that cluster. Continue? (Yes/No) Yes
```

In the following example:

- The ls command shows consistency group cg1 as 'suspended, requires-resume-at-loser' on cluster-2 after cluster-2 is declared the losing cluster during an inter-cluster link failure.
- The resume-at-loser command restarts I/O on cluster-2.
- The ls command displays the change in operational status:

```
VPlexcli:/clusters/cluster-1/consistency-groups/cg1> ls
Attributes:
Name                 Value
------------------   -------------------------------------------------------
active-clusters      [cluster-1, cluster-2]
cache-mode           synchronous
detach-rule          no-automatic-winner
operational-status   [(cluster-1,{ summary:: ok, details:: [] }),
                       (cluster-2,{ summary:: suspended, details:: [requires-resume-at-
```

```
loser] })]
passive-clusters      []
read-only             false
storage-at-clusters   [cluster-1, cluster-2]
virtual-volumes       [dd1_vol, dd2_vol]
visibility            [cluster-1, cluster-2]
Contexts:
advanced
VPlexcli:/clusters/cluster-1/consistency-groups/cg1> resume-at-loser -c cluster-2
This may change the view of data presented to applications at cluster cluster-2. You
should first stop applications at that cluster. Continue? (Yes/No) Yes
VPlexcli:/clusters/cluster-1/consistency-groups/cg1> ls
Attributes:
Name                  Value
--------------------  -------------------------------------------------------
active-clusters       [cluster-1, cluster-2]
cache-mode            synchronous
detach-rule           no-automatic-winner
operational-status    [(cluster-1,{ summary:: ok, details:: [] }),
                       (cluster-2,{ summary:: ok, details:: [] })]
passive-clusters      []
read-only             false
storage-at-clusters   [cluster-1, cluster-2]
virtual-volumes       [dd1_vol, dd2_vol]
visibility            [cluster-1, cluster-2]
Contexts:
advanced
```

See also

- `consistency-group choose-winner`
- `consistency-group resume-after-rollback`
- *Dell EMC Administration Guide for metro node*

consistency-group set-detach-rule no-automatic-winner

Sets or changes the detach-rule for one or more asynchronous consistency groups to `no-automatic-winner`.

Contexts

All contexts.

In `/clusters/cluster-n/consistency-groups/group-name` context, command is set-detach-rule no-automatic-winner.

Syntax

`consistency-group set-detach-rule no-automatic-winner`

`[-g|--consistency-group]` *consistency-group*, *consistency-group*,…

`[-f|--force]`

Arguments

Required arguments	

[-g|--consistency-group] *consistency-group*, *consistency-group*, ...	The consistency groups on which to apply the no-automatic-winner detach rule.
Optional arguments	
[-f|--force]	Force the operation to continue without confirmation. Allows this command to be run from non-interactive scripts.

Description

Applies the no-automatic-winner detach rule to one or more specified consistency groups.

ⓘ **NOTE:** This command requires user confirmation unless you use the `--force` argument.

This detach rule dictates no automatic detaches occur in the event of an inter-cluster link failure.

In the event of a cluster failure or departure, this rule-set results in I/O being suspended at all clusters whether or not metro node Witness is deployed. To resume I/O, use either the `consistency-group choose-winner` or `consistency-group resume-after-rollback` commands to designate the winning cluster.

Examples

Set the detach-rule for a single consistency group from the group's context:

```
VPlexcli:/clusters/cluster-1/consistency-groups/TestCG> set-detach-rule no-automatic-
winner
```

Set the detach-rule for two consistency groups from the root context:

```
VPlexcli:/> consistency-group set-detach-rule no-automatic-winner -g /clusters/cluster-1/
consistency-groups/TestCG,/clusters/cluster-1/consistency -groups/TestCG2
```

See also

- `consistency-group choose-winner`
- `consistency-group resume-after-rollback`
- `consistency-group set-detach-rule active-cluster-wins`
- `consistency-group set-detach-rule winner`
- Dell EMC Administration Guide for metro node

consistency-group set-detach-rule winner

Sets the detach-rule for one or more synchronous consistency groups to winner. The specified cluster becomes the winner after the specified number of seconds.

Contexts

All contexts.

In `/clusters/cluster-n/consistency-groups/group-name` context, command is `set-detach-rule winner`.

Syntax

```
consistency-group set-detach-rule winner
```

[-c\|--cluster] *cluster-id*

```
[-d|--delay] seconds

[-g|--consistency-group] consistency-group,consistency-group...


[-f|--force]
```

Arguments

Required arguments	
`[-c|--cluster]` *cluster-id*	The cluster that will be the winner in the event of an inter-cluster link failure.
`[-d|--delay]` *seconds*	The number of seconds after an inter-cluster link fails before the winning cluster detaches. Valid values for the delay timer are: ● 0 - Detach occurs immediately after the failure is detected. ● *number* - Detach occurs after the specified number of seconds have elapsed. There is no practical limit to the number of seconds, but delays longer than 30 seconds won't allow I/O to resume quickly enough to avoid problems with most host applications.
Optional arguments	
`[-g|--consistency-group]` *consistency-group, consistency-group, ...*	The consistency groups on which to apply the winner detach rule.
`[-f|--force]`	Force the operation to continue without confirmation. Allows this command to be run from non-interactive scripts.

Description

Applies the winner detach rule to one or more specified synchronous consistency groups.

(i) **NOTE:** This command requires user confirmation unless the `--force` argument is used.

In the event of a cluster failure or departure, this rule-set results in I/O continuing on the selected cluster only. I/O will be suspended at all other clusters. If metro node Witness is deployed it will overrides this selection if the selected cluster has failed.

Examples

Set the detach-rule for a single consistency group from the group's context:

```
VPlexcli:/clusters/cluster-1/consistency-groups/TestCG> set-detach-rule winner --cluster
cluster-1 --delay 5s
```

Set the detach-rule for two consistency groups from the root context:

```
VPlexcli:/> consistency-group set-detach-rule winner --cluster cluster-1 --delay 5s --
consistency-groups TestCG, TestCG2
```

See also

● `consistency-group set-detach-rule active-cluster-wins`
● `consistency-group set-detach-rule no-automatic-winner`
● *Dell EMC Administration Guide for metro node*

consistency-group summary

Displays a summary of all the consistency groups with a state other than OK.

Contexts

All contexts.

Syntax

```
consistency-group summary
```

Description

Displays all the consistency groups with a state other than 'OK' and the consistency groups at the risk of a rollback.

Example

Display a summary of unhealthy consistency groups:

```
VPlexcli:/> consistency-group summary
1 consistency groups have status not 'OK'.
Consistency Goup     Operational Status  Status        Active       Passive
Name                 ------------------  Detailed      Cluster      Cluster
------------------   ------------------  ------------  -----------  -----------
GRP3                 Suspended
0 consistency groups have risk of roll back.
```

See also

- `consistency-group create`
- `consistency-group destroy`
- *Dell EMC Administration Guide for metro node*

date

Displays the current date and time in Coordinated Universal Time (UTC).

Contexts

All contexts.

Syntax

```
date
```

Examples

```
VPlexcli:/> date
Tue Jul 20 15:57:55 UTC 2010director ping
```

describe

Describes the attributes of the given context.

Contexts

All contexts with attributes.

Syntax

describe

[-c|--context] *context-path*

Arguments

Optional arguments	
[-c|--context] *context-path*	Context to describe.

Examples

In the following example, the `ll` command displays information about a port, and the `describe` command with no arguments displays additional information.

```
VPlexcli:/clusters/cluster-2/exports/ports/P000000003CB001CB-B1-FC01> ll
Name                     Value
----------------------   ------------------
director-id              0x000000003cb001cb
discovered-initiators    []
.
.
.
VPlexcli:/clusters/cluster-2/exports/ports/P000000003CB001CB-B1-FC01> describe
Attribute                Description
----------------------   ---------------------------------------------------
director-id              The ID of the director where the port is exported.
discovered-initiators    List of all initiator-ports visible from this port.
.
.
.
```

Use the `describe --context` command to display information about the specified context:

```
VPlexcli:/> describe --context /clusters/cluster-2/exports/ports/P000000003CB001CB-B1-
FC01
Attribute
Description
--------------------------------------------------------------------------------
----------------
/clusters/cluster-2/exports/ports/P000000003CB001CB-B1-FC01::director-id
The ID of the director where the port is exported.
```

```
/clusters/cluster-2/exports/ports/P000000003CB001CB-B1-FC01::discovered-initiators
List of all initiator-ports visible from this port.
.
.
.
```

device attach-mirror

Attaches a mirror as a RAID 1 child to another (parent) device, and starts a rebuild to synchronize the mirror.

Contexts

All contexts.

Syntax

device attach-mirror

[-d|--device]
{*context-path*|*device-name*}

[-m|--mirror]{*context-path*|*mirror-name*}

[-r|--rule-set] *rule-set*

[-f|--force]

Arguments

Required arguments	
[-d|--device] *context-path* or *device-name*	* Name or context path of the device to which to attach the mirror. Does not have to be a top-level device. If the device name is used, verify that the name is unique throughout the metro node, including local devices on other clusters.
Optional arguments	
[-m|--mirror] *context-path* or *mirror-name*	* Name or context path of the mirror to detach. Does not need to be a top-level device. If the name of a device is used, ensure the device name is not ambiguous, For example, ensure that the same device name is not used by local devices in different clusters.
[-r|--rule-set] *rule-set*	Rule-set to apply to the distributed device that is created when a mirror is added to a local device.
[-f|--force]	When --force is set, do not ask for confirmation when attaching a mirror. Allows this command to be run using a non-interactive script. If the --force argument is not used, prompts for confirmation in two circumstances when the mirror is remote and the parent device must be transformed into a distributed device.

* - argument is positional.

Description

If the parent device is a RAID 0 or RAID C, it is converted to a RAID 1.

If the parent device and mirror device are from different clusters, a distributed device is created.

A storage-volume extent cannot be used as a mirror if the parent device is a distributed-device, or if the parent device is at a different cluster than the storage-volume extent.

If you do not specify the --rule-set argument, metro node assigns a default rule-set to the distributed device as follows:

- If the parent device has a volume, the distributed device inherits the rule-set of the (exported) parent.
- If the parent device does not have a volume, the cluster that is local to the management server is assumed to be the winner.

Once determined, metro node displays a notice as to which rule-set the created distributed-device has been assigned.

When attaching a remote mirror to a local device, or when attaching a new mirror to a distributed device, both operations consume slots. Both scenarios result in the same following error message:

```
VPlexcli:/clusters/cluster-2/storage-elements/extents> device attach-mirror -d
rhyan_dr_test -m rhyan_mig_src_0000
device attach-mirror:  Evaluation of <<device attach-mirror -d dr_test -m mig_src_0000>>
failed.
cause:                 Unable to attach mirror 'mig_src_0000' to device 'dr_test'.
cause:                 Unable to attach mirror 'mig_src_0000' to distributed Device
'dr_test'.
cause:                 Firmware command error.
cause:                 Active metadata device does not have a free slot.
```

Refer to the troubleshooting section of the metro node procedures in the SolVe Desktop for instructions on increasing the number of slots.

(i) **NOTE:** If the RAID 1 device is added to a consistency group, the consistency group's detach rule overrides the device's detach rule.

Use the `rebuild status` command to display the rebuild's progress.

- The rule set that will be applied to the new distributed device potentially allows conflicting detaches.

Homogeneous array requirement for thin volumes

To preserve thinness of the new RAID-1 device where the parent device is created on a thin volume and is thin-capable, the mirror device must be created from the same storage-array-family as the parent device. If the user tries to attach a mirror leg from a dissimilar array-family, the command displays a warning that the thin-capability of the RAID-1 device will be lost and it can render the virtual volume to be thin disabled. The following is an example of the warning message:

```
VPlexcli:/> device attach-mirror --device xio_device --mirror vnx_device
Thin-capability is only supported with homogeneous storage-array types. The top-level
device
'xio_device' is supported by XtremIO but the mirror 'vnx_device' is supported by
CLARiiON.
Since XtremIO and CLARiiON are not homogeneous, the top-level device will lose thin-
capability
after the new mirror is attached. Do you wish to proceed?  (Yes/No) No

device attach-mirror:  Evaluation of <<device attach-mirror --device xio_device --mirror
vnx_device>>
                       failed.
cause:                 Unable to attach mirror 'vnx_device' to device 'xio_device'.
cause:                 Operation was halted by the user

VPlexcli:/>
```

Example

Attach a mirror without specifying a rule-set (allow metro node to select the rule-set):

```
VPlexcli:/clusters/cluster-1/devices> virtual-volume create test_r0c_1
VPlexcli:/clusters/cluster-1/devices> device attach-mirror --device test_r0c_1 --mirror
test_r0c_2
Distributed device 'regression_r0c_1' is using rule-set 'cluster-1-detaches'.
```

Attach a mirror:

```
VPlexcli:/> device attach-mirror --device /clusters/cluster-1/devices/site1device0 --
mirror /clusters/cluster-1/devices/site1mirror
```

See also

- `consistency-group set-detach-rule winner`
- `device detach-mirror`
- `rebuild status`

device collapse

Collapses a one-legged device until a device with two or more children is reached.

Contexts

All contexts.

Syntax

```
device collapse
[-d|--device] [context-path|device-name]
```

Arguments

Required arguments	
`[-d|--device]` [*context-path|device-name*]	* Name or context path of the device to collapse. Does not have to be a top-level device. If the device name is used, verify that the name is unique throughout the metro node, including local devices on other clusters.

* - argument is positional.

Description

If a RAID 1 device is left with only a single child (after removing other children), use the `device collapse` command to collapse the remaining structure. For example:

If RAID 1 device "A" has two child RAID 1 devices "B" and "C", and child device "C" is removed, A is now a one-legged device, but with an extra layer of abstraction:

```
    A
    |
    B
../ \..
```
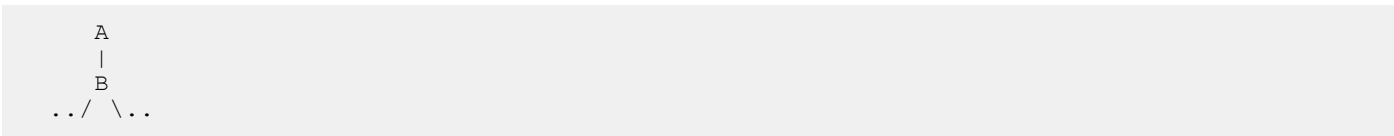
Use `device collapse` to remove this extra layer, and change the structure into:

```
    A
../ \..
```
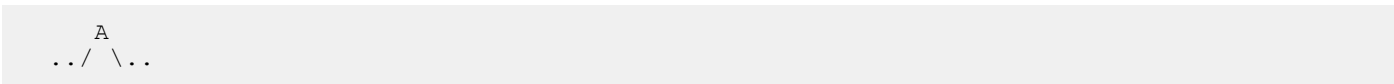
Applicable to one-legged devices that are not top-level.

Examples

```
VPlexcli:/clusters/cluster-1/devices> device collapse --device /clusters/cluster-1/
devices/A
```

device detach-mirror

Removes (detaches) a mirror from a RAID-1 device.

Contexts

All contexts.

Syntax

```
device detach-mirror
```

[-d|--device] [*context-path|device-name*]

[-m|--mirror] [*context-path|mirror-name*]

[-s|--slot] *slot-number*

[-i|--discard]

[-f|--force]

Arguments

Required arguments	
[-d|--device] *context-path or device-name*	* Name or context path of the device from which to detach the mirror. Does not have to be a top-level device. If the device name is used, verify that the name is unique throughout the system, including local devices on other clusters.
Optional arguments	
[-m|--mirror] *context-name or mirror-name*	* Name or context path of the mirror to detach. Does not have to be a top-level device. If the device name is used, verify that the name is unique throughout the metro node, including local devices on other clusters.
[-s|--slot] *slot-number*	Slot number of the mirror to be discarded. Applicable only when the --discard argument is used.
[-i|--discard]	When specified, discards the detached mirror. The data is not discarded.
[-f|--force]	Force the mirror to be discarded. Must be used when --discard argument is used. The --force argument is set for detaching an unhealthy mirror it is discarded even if --discard flag is not set.

* - argument is positional.

Description

Use this command to detach a mirror leg from a RAID 1 device.
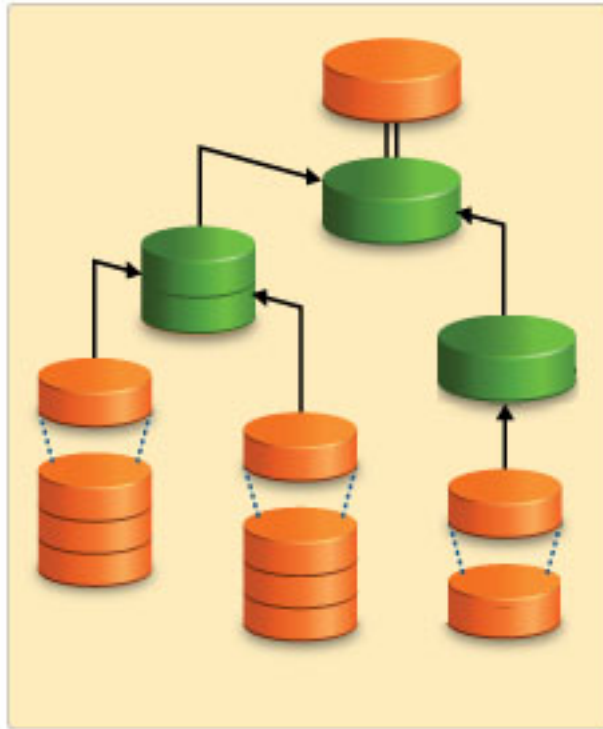
Figure 1. RAID device and virtual volume: before detach mirror

If the RAID device supports a virtual volume, and you don't use the `--discard` argument the command:

- Removes the mirror (child device) from the RAID 1 parent device.
- Makes the detached child a top-level device.
- Creates a new virtual volume on top the new device and prefixes the name of the new device with the name of the original device.
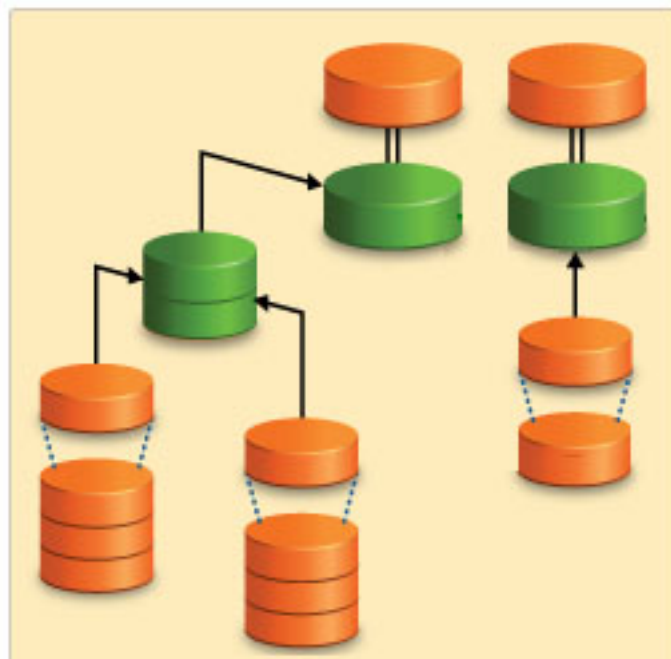
Figure 2. Devices and virtual volumes: after detach mirror - no discard

If the RAID device supports a virtual volume, and you use the `--discard` argument, the command:

- Removes the mirror (child device) from the RAID 1 parent device.

- Makes the detached child a top-level device.
- Creates no new virtual.
- Detaches the mirror regardless of its current state and does not guarantee data consistency.
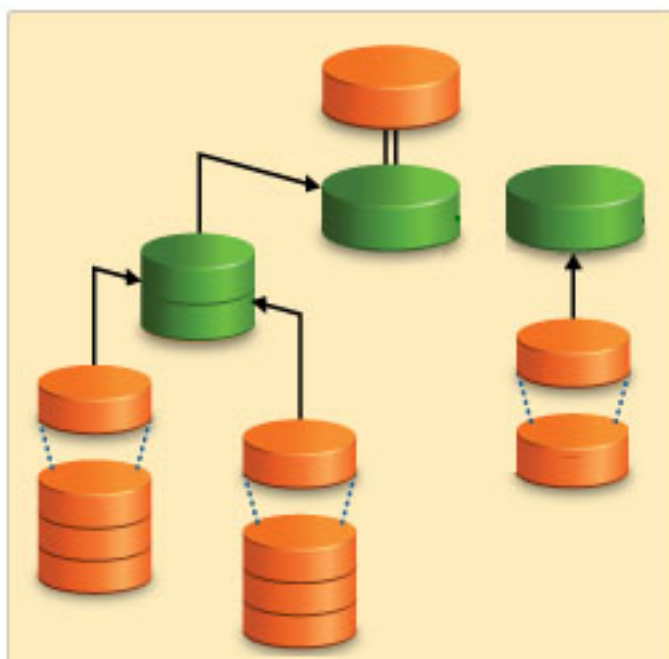
Figure 3. Devices and virtual volumes: after detach mirror - with discard

Examples

```
VPlexcli:/clusters/cluster-1> device detach-mirror --device /clusters/cluster-1/devices/
cluster1device0 --mirror /clusters/cluster-1/devices/cluster8mirror
```

Identify and detach a dead mirror leg from a distributed device.

In the following example:

- The `ll` command in /distributed-storage/distributed-devices context displays a stressed distributed device.
- The `ll device-name/distributed-device-components` command displays the components of the device (output is truncated)

  Note the Slot number of the failed leg in the display.

- The `device detach-mirror` command removes the failed device using the slot number displayed in the previous step.
- The `ll` command in `/distributed-storage/distributed-devices` context displays the change:

```
VPlexcli:/distributed-storage/distributed-devices> ll
Name                     Status    Operational  Health State  Auto     Rule   WOF
 Transfer
------------------------ -------   Status       -----------   Resume Set  Group  Size
------------------------ -------   ----------   ------------- ------    Name   Name
--------
----------------- -----  -------   ----------   ------------- ------   -----  -----
--------
ESX_stretched_device     running   ok           ok            true     colin  -      2M
bbv_temp_device          running   ok           ok            true     colin  -      2M
dd_source_device         running   ok           ok            true     colin  -      2M
ddt                      running   ok           ok            true     colin  -      2M
dev_test_dead_leg_2      running   stressed     major-failure  -        colin  -      2M
windows_big_drive        running   ok           ok            true     colin  -      2M
.
.
.
VPlexcli:/distributed-storage/distributed-devices> ll /dev_test_dead_leg_2_DD/
distributed-device-components/
```

```
/distributed-storage/distributed-devices/dev_test_dead_leg_2_DD/distributed-device-
components:
Name                       Cluster  Child  Fully    Operational  Health ..
-------------------------- -------  Slot   Logged   Status       State....
-------------------------- -------- -----  ------   ----------   ------
dev_test_alive_leg_1    cluster-1 1    true     ok           ok
dev_test_dead_leg_2     cluster-2 0    true     error        critical-failure
VPlexcli:/distributed-storage/distributed-devices> device detach-mirror --slot 0
--discard --force --device /distributed-storage/distributed-devices/dev_test_dead_ leg_2
VPlexcli:/distributed-storage/distributed-devices> ll
Name
     Status    Operational Health  Auto    Rule    WOF    Transfer
-------------------------- -------  Status            State   Resume  Set     Group   Size
-------------------------- -------  ----------  ------  ------
 Name   Name    --------
-------------------------- -------  ----------  ------  ------
 ----- -----  --------
ESX_stretched_device          running  ok          ok      true    colin   -       2M
bbv_temp_device               running  ok          ok      true    colin   -       2M
dd_source_device              running  ok          ok      true    colin   -       2M
ddt                           running  ok          ok      true    colin   -       2M
dev_test_dead_leg_2_DD        running  ok          ok      -       colin   -       2M
windows_big_drive             running  ok          ok      true    colin   -       2M
.
.
.
```

See also

- `device attach-mirror`

device mirror-isolation auto-unisolation disable

Disables mirror auto-unisolation.

Contexts

All contexts.

Syntax

```
device mirror-isolation auto-unisolation disable
```

`[-f|--force]`

`[-h|--help]`

`[--verbose]`

Arguments

Optional arguments	
`[-f|--force]`	Forces the operation to continue without confirmation.
`[-h|--help]`	Displays command line help.
`[--verbose]`	Provides more output during command execution. This may not have any effect for some commands.

Description

Mirror isolation provides a mechanism to automatically unisolate mirrors that were previously isolated. When mirror isolation feature is enabled, disabling mirror auto-unisolation will prevent the system from automatically unisolating any isolated mirrors whose underlying storage-volume's performance is now in the acceptable range.

For the option to manually unisolate the mirror, follow the troubleshooting procedure for metro node in the SolVe Desktop.

Examples

Shows the result when the command is executed on all clusters when mirror isolation is disabled:

```
VPlexcli:/> device mirror-isolation auto-unisolation disable
Mirror isolation provides a mechanism to automatically unisolate mirrors that were
previously isolated. This operation will prevent the system from automatically
unisolating the underlying storage-volumes once their performance is in the acceptable
range. You can manually unisolate the mirror by following the troubleshooting procedure.
Continue to disable auto-unisolation? (Yes/No) y
Auto-unisolation is disabled on clusters cluster-1,cluster-2.
```

Shows the command executed with the `--force` option, when the mirror-isolation feature is disabled:

```
VPlexcli:/> device mirror-isolation auto-unisolation disable -f
Mirror isolation is not enabled on clusters cluster-1,cluster-2.
Mirror isolation provides a mechanism to automatically unisolate mirrors that were
previously isolated. When mirror isolation is enabled, this operation will prevent
the system from automatically unisolating the underlying storage-volumes once their
performance is in the acceptable range. You can manually unisolate the mirror by
following the troubleshooting procedure.
Auto-unisolation is disabled on clusters cluster-1,cluster-2.
```

Shows auto-unisolation was not disabled because the feature is not supported:

```
VPlexcli:/> device mirror-isolation auto-unisolation disable
Mirror isolation is not enabled on clusters cluster-1,cluster-2.
Mirror isolation provides a mechanism to automatically unisolate mirrors that were
previously isolated. When mirror isolation is enabled, this operation will prevent
the system from automatically unisolating the underlying storage-volumes once their
performance is in the acceptable range. You can manually unisolate the mirror by
following the troubleshooting procedure.
Continue to disable auto-unisolation? (Yes/No) y
device mirror-isolation auto-unisolation disable:  Evaluation of <<device mirror-
isolation
auto-unisolation disable>> failed.
cause:                            Could not disable auto unisolation.
cause:                            Could not disable auto unisolation.
                        Modifying auto unisolation is not supported
    by this version of firmware.
```

Shows auto-unisolation failed because one cluster is not available:

```
VPlexcli:/> device mirror-isolation auto-unisolation disable
device mirror-isolation auto-unisolation disable:  Evaluation of <<device mirror-
isolation auto-unisolation disable>> failed.
cause:                            Could not disable auto unisolation.
cause:                            Firmware command error.
cause:                            communication error recently.
```

See also

- `device mirror-isolation auto-unisolation enable`
- `device mirror-isolation disable`
- `device mirror-isolation enable`
- `device mirror-isolation show`

- *Dell EMC Administration Guide for metro node*
- Dell EMC metro node Procedures in SolVe Desktop

device mirror-isolation auto-unisolation enable

Enables mirror auto-unisolation.

Contexts

All contexts.

Syntax

```
device mirror-isolation auto-unisolation enable
[-h|--help]
[--verbose]
```

Arguments

Optional arguments	
[-h|--help]	Displays command line help.
[--verbose]	Provides more output during command execution. This may not have any effect for some commands.

Description

This command enables auto mirror unisolation.

Mirror isolation provides a mechanism to automatically unisolate mirrors that were previously isolated. When mirror isolation is enabled, auto-unisolation allows the system to automatically unisolate the underlying storage-volumes once their performance is in the acceptable range.

Examples

Shows auto-unisolation enabled when mirror isolation is disabled on both clusters:

```
VPlexcli:/> device mirror-isolation auto-unisolation enable
Mirror isolation is not enabled on clusters cluster-1,cluster-2.
Auto-unisolation is enabled on clusters cluster-1,cluster-2.
```

Shows auto-unisolation enabled when mirror isolation is disabled on one of the clusters:

```
VPlexcli:/> device mirror-isolation auto-unisolation enable
Mirror isolation is not enabled on cluster cluster-2.
Auto-unisolation is enabled on clusters cluster-1,cluster-2.
```

Shows auto-unisolation when mirror isolation is enabled:

```
VPlexcli:/> device mirror-isolation auto-unisolation enable
Auto-unisolation is enabled on clusters cluster-1,cluster-2.
```

Shows auto-unisolation enable operation failed as the feature is not supported:

```
VPlexcli:/> device mirror-isolation auto-unisolation enable
Mirror isolation is not enabled on clusters cluster-1,cluster-2.
device mirror-isolation auto-unisolation enable:  Evaluation of <<device mirror-
isolation auto-unisolation enable>> failed.
cause:                              Could not enable auto unisolation.
cause:                              Could not enable auto unisolation.
                              Modifying auto unisolation is not supported by this version
of firmware.
```

Shows auto-unisolation enable operation failed because one cluster is not available:

```
VPlexcli:/> device mirror-isolation auto-unisolation enable
device mirror-isolation auto-unisolation enable:  Evaluation of <<device mirror-
isolation auto-unisolation enable>> failed.
cause:                                  Could not enable auto unisolation.
cause:                                  Firmware command error.
cause:                                  communication error recently.
```

Shows auto-unisolation enable operation failed because the meta volume is not ready:

```
VPlexcli:/> device mirror-isolation auto-unisolation enable
device mirror-isolation auto-unisolation enable:  Evaluation of <<device mirror-
isolation auto-unisolation enable>> failed.
cause:                                  Could not enable auto unisolation.
cause:                                  Could not enable auto unisolation.
                                     Firmware command error. The active
metadata device is not healthy enough to persist the change fully.
```

See also

- device mirror-isolation auto-unisolation disable
- device mirror-isolation disable
- device mirror-isolation enable
- device mirror-isolation show
- *Dell EMC Administration Guide for metro node*

device mirror-isolation disable

Disables mirror isolation on the specified clusters.

Contexts

All contexts.

Syntax

device mirror-isolation disable

[-c|--clusters] *context-path* [, *context-path*...]

[-f|--force]

[-h|--help]

[--verbose]

Arguments

Optional arguments	
`[-c|--clusters]` *context-path* [, *context-path*...]	Specifies the list of clusters on which to disable mirror isolation.
`[-f|--force]`	Forces the operation to continue without confirmation.
`[-h|--help]`	Displays command line help.
`[--verbose]`	Provides more output during command execution. This may not have any effect for some commands.

Description

A RAID 1 mirror leg built upon a poorly performing storage volume can bring down the performance of the whole RAID 1 device and increase I/O latencies to the applications using this device. Metro node prevents I/Os to these poorly performing mirror legs to improve the RAID 1 performance. This behavior or feature is known as mirror isolation.

When disabling the mirror isolation feature on one or more clusters, this command prints a warning and asks for confirmation.

ⓘ **NOTE:** This command disables the mirror isolation feature and prevents metro node from improving the performance of a RAID 1 device containing a poorly performing mirror leg. This command should only be used if redundancy is desired over RAID 1 performance improvement.

Examples

Disable mirror isolation on all clusters:

```
VPlexcli:/> device mirror-isolation disable
Disabling the mirror isolation feature will prevent metro node from improving the
performance of a RAID-1 device containing a poorly performing mirror leg. This command
should be only used if redundancy is desired over RAID-1 performance improvement.
Continue to disable mirror isolation on cluster-1,cluster-2? (Yes/No) Yes
Mirror isolation has been disabled on 'cluster-1'.
Mirror isolation has been disabled on 'cluster-2'.
```

Disable mirror isolation on all clusters without being prompted to confirm:

```
VPlexcli:/> device mirror-isolation disable -f
WARNING: Disabling the mirror isolation feature will prevent metro node from improving
the performance of a RAID-1 device containing a poorly performing mirror leg. This
command should be only used if redundancy is desired over RAID-1 performance improvement.
Mirror isolation has been disabled on 'cluster-1'.
Mirror isolation has been disabled on 'cluster-2'.
```

Disable mirror isolation on one cluster:

```
VPlexcli:/> device mirror-isolation disable -c cluster-1
Disabling the mirror isolation feature will prevent metro node from improving the
performance of a RAID-1 device containing a poorly performing mirror leg. This command
should be only used if redundancy is desired over RAID-1 performance improvement.
Continue to disable mirror isolation on cluster-1 (Yes/No) Yes
Mirror isolation has been disabled on 'cluster-1'.
```

Attempt to disable mirror-isolation on the clusters when it is already disabled:

```
VPlexcli:/> device mirror-isolation disable -f
WARNING: Disabling the mirror isolation feature will prevent metro node from improving
the performance of a RAID-1 device containing a poorly performing mirror leg. This
command should be only used if redundancy is desired over RAID-1 performance improvement.
Mirror isolation has been disabled on 'cluster-1'.
Mirror isolation has been disabled on 'cluster-2'.
```

Attempt to disable mirror-isolation on a system where mirror-isolation is not supported:

```
VPlexcli:/> device mirror-isolation disable -f
WARNING: Disabling the mirror isolation feature will prevent metro node from improving
the performance of a RAID-1 device containing a poorly performing mirror
        leg. This command should be only used if redundancy is desired over RAID-1
performance improvement.
device mirror-isolation disable:  Evaluation of <<device mirror-isolation disable -f>>
failed.
cause:                            Could not disable mirror isolation on 'cluster-1'.
cause:                            Firmware command error.
cause:                            no such command.
```

Attempt to disable mirror-isolation on both clusters and succeeded on cluster 1, but failed on cluster 2 because the feature is not supported:

```
VPlexcli:/> device mirror-isolation disable
Disabling the mirror isolation feature will prevent metro node from improving the
performance of a RAID-1 device containing a poorly performing mirror leg. This command
should be only used if redundancy is desired over RAID-1 performance improvement.
Continue to disable mirror isolation on cluster-1,cluster-2 (Yes/No) Yes
Mirror isolation has been disabled on 'cluster-1'.
device mirror-isolation disable:  Evaluation of <<device mirror-isolation disable>>
failed.
cause:                            Could not disable mirror isolation on 'cluster-2'.
cause:                            Firmware command error.
cause:                            invalid subcommand.
```

See also

- device mirror-isolation auto-unisolation disable
- device mirror-isolation auto-unisolation enable
- device mirror-isolation enable
- device mirror-isolation show
- *Dell EMC Administration Guide for metro node*

device mirror-isolation enable

Enables mirror isolation on the specified clusters.

Contexts

All contexts.

Syntax

device mirror-isolation enable

[-c|--clusters] *context-path* [, *context-path*...]

[--also-enable-autounisolation]

[-h|--help]

[--verbose]

Arguments

Optional arguments	

[-c|--clusters] *context-path* [, **context-path**...]	Specifies the list of clusters on which to enable mirror isolation.
[--also-enable-autounisolation]	Enables auto-unisolation if specified.
[-h|--help]	Displays command line help.
[--verbose]	Provides more output during command execution. This may not have any effect for some commands.

Description

A RAID 1 mirror leg built on a poorly performing storage volume can bring down the performance of the whole RAID 1 device and increase I/O latencies to the applications using this device. Metro node prevents I/Os to these poorly performing mirror legs to improve the RAID 1 performance. This behavior or feature is known as mirror isolation.

ⓘ **NOTE:** This command enables the mirror isolation feature and should only be used if RAID 1 performance improvement is desired over redundancy.

Examples

Enable mirror isolation on all clusters:

```
VPlexcli:/> device mirror-isolation enable
Mirror isolation has been enabled on 'cluster-1'.
Mirror isolation has been enabled on 'cluster-2'.
```

Or

```
VPlexcli:/> device mirror-isolation enable -c *
Mirror isolation has been enabled on 'cluster-1'.
Mirror isolation has been enabled on 'cluster-2'.
```

Enable mirror isolation on one cluster:

```
VPlexcli:/> device mirror-isolation enable -c cluster-1
Mirror isolation has been enabled on 'cluster-1'.
```

Attempt to enable mirror-isolation on the clusters when it is already enabled:

```
VPlexcli:/> device mirror-isolation enable
Mirror isolation has been enabled on 'cluster-1'.
Mirror isolation has been enabled on 'cluster-2'.
```

Enable mirror-isolation when auto-unisolation is disabled:

```
VPlexcli:/> device mirror-isolation enable
Mirror isolation has been enabled on 'cluster-1'.
Mirror isolation has been enabled on 'cluster-2'.
Please be aware that auto unisolation is disabled. In order to manually enable this
feature you can use 'device mirror-isolation auto-unisolation enable'.
```

Enable mirror-isolation and auto-unisolation on both clusters:

```
VPlexcli:/> device mirror-isolation enable --also-enable-autounisolation
Mirror isolation has been enabled on 'cluster-1'.
Mirror isolation has been enabled on 'cluster-2'.
Auto-unisolation is enabled on clusters cluster-1,cluster-2.
```

Attempt to enable mirror-isolation on a system where mirror-isolation is not supported:

```
VPlexcli:/> device mirror-isolation enable
device mirror-isolation enable:  Evaluation of <<device mirror-isolation enable>> failed.
cause:                           Could not enable mirror isolation on 'cluster-1'.
cause:                           Firmware command error.
cause:                           no such command.
```

Attempt to enable mirror-isolation on both clusters and succeeded on cluster 1, but failed on cluster 2 because the feature is not supported:

```
VPlexcli:/> device mirror-isolation enable
Mirror isolation has been enabled on 'cluster-1'.
device mirror-isolation disable:  Evaluation of <<device mirror-isolation enable>>
failed.
cause:                            Could not enable mirror isolation on 'cluster-2'.
cause:                            Firmware command error.
cause:                            invalid subcommand.
```

See also

- `device mirror-isolation auto-unisolation disable`
- `device mirror-isolation auto-unisolation enable`
- `device mirror-isolation disable`
- `device mirror-isolation show`
- *Dell EMC Administration Guide for metro node*

device mirror-isolation show

Lists the configuration parameters related to mirror isolation for the specified clusters.

Contexts

All contexts.

Syntax

`device mirror-isolation show`

`[-c|--clusters]` *context-path* `[`, *context-path*...]

`[-h|--help]`

`[--verbose]`

Arguments

Optional arguments	
`[-c|--clusters]` *context-path* `[`, *context-path*...]	Specifies the list of clusters on which to show mirror isolation configuration parameters.
`[-h|--help]`	Displays command line help.
`[--verbose]`	Provides more output during command execution. This may not have any effect for some commands.

Description

Used to display all the configuration parameters related to mirror isolation for the specified clusters.

The current configuration parameters supported are:

Table 6. Supported configuration parameters

Enabled	Indicates "true" if the feature is enabled, "false" if disabled and "<not available>" if the value could not be retrieved.
Auto Unisolation	Indicates "true" if the system will automatically unisolate an isolated mirror when the underlying storage-volume's performance is in the acceptable range, "false" if manual unisolation was desired, and "<not available>" if the value could not be retrieved.
Isolation Interval	Indicates the isolation sweep interval in seconds if the value was retrieved successfully, and "<not available>" if the value could not be retrieved.
Unisolation interval	Indicates the unisolation sweep interval in seconds if the value was retrieved successfully, and "<not available>" if the value could not be retrieved.

If a value for any configuration parameter cannot be retrieved for the cluster, it may be because the feature is not supported or there was a command failure.

Examples

Shows the mirror isolation configuration parameters on all clusters:

```
VPlexcli:/> device mirror-isolation show
  Cluster    Enabled Auto unisolation  Isolation Interval  Unisolation Interval
  --------   ------- ----------------  ------------------  --------------------
  cluster-1  true    false             60                  14400
  cluster-2  true    false             60                  14400
```

Or

```
VPlexcli:/> device mirror-isolation show -c *
  Cluster    Enabled Auto unisolation  Isolation Interval  Unisolation Interval
  --------   ------- ----------------  ------------------  --------------------
  cluster-1  true    false             60                  14400
  cluster-2  true    false             60                  14400
```

Shows the mirror isolation configuration parameters on one cluster:

```
VPlexcli:/> device mirror-isolation show -c cluster-1
  Cluster    Enabled Auto unisolation  Isolation Interval  Unisolation Interval
  --------   ------- ----------------  ------------------  --------------------
  cluster-1  true    false             60                  14400
```

Shows the command executed on an invalid cluster:

```
VPlexcli:/> device mirror-isolation show -c blah
    device mirror-isolation show:     Evaluation of <<device mirror-isolation show -c
blah>> failed.
    cause:                  Command execution failed.
    cause:                  Failed to set value for option --clusters.
    cause:                  Could not find appropriate contexts matching '[blah]'.
```

Shows the firmware command or feature is not supported:

```
VPlexcli:/> device mirror-isolation show
  Cluster    Enabled         Auto unisolation  Isolation Interval  Unisolation Interval
```

```
    ---------  ---------------  ----------------  ------------------  --------------------
    cluster-1  <not available>  <not available>   <not available>     <not available>
    cluster-2  <not available>  <not available>   <not available>     <not available>
```

Shows the auto-unisolation feature is not supported:

```
VPlexcli:/> device mirror-isolation show
   Cluster    Enabled  Auto unisolation  Isolation Interval  Unisolation Interval
   ---------  -------  ---------------   ------------------  --------------------
   cluster-1  true     <not available>          60                  14400
   cluster-2  true     <not available>          60                  14400
```

See also

- device mirror-isolation auto-unisolation disable
- device mirror-isolation auto-unisolation enable
- device mirror-isolation disable
- device mirror-isolation enable
- *Dell EMC Administration Guide for metro node*

device resume-link-down

Resumes I/O for devices on the winning island during a link outage.

Contexts

All contexts.

Syntax

device resume-link-down

[-c|--cluster] *context path*

[-r|--devices] *context path*

[-a|--all-at-island]

[-f|--force]

Arguments

Optional arguments	
[-c|--cluster] *context path*	Resume I/O on the specified cluster and the clusters it is in communication with during a link outage. Applicable only when the all-at-island argument is used or when the specified devices are distributed devices. Not required for local devices with global visibility.
[-r|--devices] *context path or device-name*	Name or context path of the devices for which to resume I/O. They must be top-level devices.
[-a|--all-at-island]	Resume I/O on all devices on the chosen winning cluster and the clusters with which it is communicating.

`[-f|--force]`	Force the I/O to resume.

Description

Used when the inter-cluster link fails. Allows one or more suspended mirror legs to resume I/O immediately.

For example, used when the peer cluster is the winning cluster but is known to have failed completely.

Resumes I/O on the specified cluster and the clusters it is in communication with during a link outage.

Detaches distributed devices from those clusters that are not in contact with the specified cluster or detaches local devices from those clusters that are not in contact with the local cluster.

⚠️ **WARNING: The `device resume-link-down` command causes I/O to resume on the local cluster regardless of any rule-sets applied to the device. Verify that rules and any manual detaches do not result in conflicting detaches (cluster-1 detaching cluster-2, and cluster-2 detaching cluster-1). Conflicting detaches will result in lost data on the losing cluster, a full rebuild, and degraded access during the time of the full rebuild.**

When the inter-cluster link fails in a metro node Metro configuration, distributed devices are suspended at one or more clusters. When the rule-set timer expires, the affected cluster is detached.

Alternatively, use the `device resume-link-down` command to detach the cluster immediately without waiting for the rule-set timer to expire.

⚠️ **WARNING: Verify that rules and any manual detaches do not result in conflicting detaches (cluster-1 detaching cluster-2, and cluster-2 detaching cluster-1).**
Conflicting detaches result in lost data on the losing cluster, a full rebuild, and degraded access during the time of the full rebuild.

Only one cluster should be allowed to continue for each distributed device. Different distributed devices can have different clusters continue.

Use the `ll /distributed-storage/distributed-devices/`*device* command to display the rule set applied to the specified device.

Use the `ll /distributed-storage/rule-sets/rule-set/`*rules* command to display the detach timer for the specified rule-set.

Examples

```
VPlexcli:/distributed-storage/distributed-devices> device resume-link-down --all-at-
island --cluster --devices DD_5d --force
```

See also

- `device resume-link-up`
- `ds dd declare-winner`

device resume-link-up

Resumes I/O on suspended top level devices, virtual volumes, or all virtual volumes in the metro node.

Contexts

All contexts.

Syntax

```
device resume-link-up

[-r|--devices] context path,context path...

[-v|--virtual-volumes] context path,context path...

[-a|--all]

[-f|--force]
```

Arguments

Optional arguments	
`[-r|--devices]` *context path*, *context path...*	List of one or more context paths or names of the devices for which to resume I/O. They must be top-level devices. If the device name is used, verify that the name is unique throughout the metro node, including local devices on other clusters.
`[-v|--virtual-volume]` *context path,context path...*	Resume I/O on the specified virtual volumes.
`[-a|--all]`	Resume I/O on all virtual volumes on the losing cluster.
`[-f|--force]`	Force the I/O to resume.

Description

Use this command after a failed link is restored, but I/O is suspended at one or more clusters.

Usually applied to the mirror leg on the losing cluster when `auto-resume` is set to false.

During a WAN link outage, after cluster detach, the primary cluster detaches to resume operation on the distributed device.

If the `auto-resume` property of a remote or distributed device is set to `false` and the link has come back up, use the `device resume-link-up` command to manually resume the second cluster.

Example

Resume I/O on two specified devices:

```
VPlexcli:/distributed-storage/distributed-devices> device resume-link-up --devices
CLAR0014_LUN17_1, CLAR0014_LUN18_1 --force
```

Resume I/O on a specified virtual volume:

```
VPlexcli:/> device resume-link-up --virtual-volumes /clusters/cluster-1/virtual-volumes/
ESX_DataStore1_vol --force
```

Resume I/O on all virtual volumes in the losing cluster:

```
VPlexcli:/> device resume-link-up --all --force
```

See also

● `device mirror-isolation disable`

device resurrect-dead-storage-volumes

Resurrect the thin-aware storage-volumes supporting the target devices that are marked dead.

Contexts

Any

Syntax

```
device resurrect-dead-storage-volumes
[-h|--help]
[--verbose]
[-r|--devices=]device [,device[,device]]
```

Arguments

Optional arguments	
`-h	--help`	Displays the usage for this command.
`--verbose`	Provides more output during command execution. This may not have any effect for some commands.
Required arguments	
`-r|--devices=`device [,device[,device]]	*Specifies the devices to resurrect dead supporting storage-volumes on. The device name can include wild card symbols.

* Argument is positional.

Description

This command is used for storage volumes that do not auto-resurrect after they receive an Out Of Space error on a write command and become hardware dead. This scenario should only happen on an XtremIO storage volume that is used as a metro node mirror leg. After resolving the underlying issue that lead to an out of space error, use this command to resume I/O for supporting storage-volumes that have been marked dead. The target devices may be of any geometry, local or distributed. This command executes `storage-volume resurrect` for all dead-storage-volumes of a device. This scenario should only happen on an XtremIO storage volume that is used as a metro node mirror leg.

director commission

Starts the director's participation in the cluster.

Contexts

All contexts.

In `/clusters/cluster/directors` context, command is `commission`.

Syntax

```
director commission
```

```
[-n|--director] director
[-t|--timeout] seconds
[-a|--apply-cluster-settings]
[-f|--force]
```

Arguments

Required arguments	
`[-n|--director]` director	* The director to be commissioned.
Optional arguments	
`[-f|--force]`	Commission the director regardless of firmware version mismatch.
`--timeout` seconds	The maximum time to wait for `--apply-cluster-settings` operations to complete, in seconds. Default: 60 seconds. 0: No timeout.
`[a|--apply-cluster-settings]`	Add this director to a running cluster and apply any cluster-specific settings. Use this argument when adding or replacing a director in an existing metro node.

* - argument is positional.

Description

In order to participate in a cluster, a director must be explicitly commissioned. Uncommissioned directors can boot but do not participate in any cluster activities.

Use the `version -a` command to display the firmware version for all directors in the cluster.

The `director commission` command fails if the director's firmware version is different than the already commissioned directors, unless the `--force` argument is used.

Examples

Add a director to a running cluster using the default timeout (60 seconds):

```
VPlexcli:/> director commission --director Cluster_1_Dir1A --apply-cluster-settings
```

See also

- `director decommission`
- `version`

director decommission

Decommissions a director. The director stops participating in cluster activities.

Contexts

All contexts.

In `/clusters/cluster/directors` context, command is `decommission`.

Syntax

```
director decommission
[-n|--director] director
```

Arguments

Required arguments	
`[-n|--director]` *director*	T he director to de-commission.

Description

This command removes the director from participating in the metro node, and initializes it to only a partial operational state. The director is no longer a replication target and its front-end ports are disabled.

Then it reboots the director.

Examples

```
VPlexcli:/> director decommission --director Cluster_1_Dir1A
```

See also

- `director commission`
- `director forget`
- `director shutdown`

director fc-port-stats

Displays/resets Fibre Channel port statistics for a specific director.

Contexts

All contexts.

In `/clusters/cluster/directors` context, command is `fc-port-stats` *director*.

In context, command is *fc-port-stats*

Syntax

```
director fc-port-stats
[-d|--director] director
[-o|--role] role
[-r|--reset]
```

Arguments

Required arguments	
[-d|--director] director	Context path of the director for which to display FC statistics. Not required if the current context is /clusters/cluster/directors/director.
Optional arguments	
[-o|--role] role	Filter the ports included in the reply by their role. If no role is specified, all ports at the director are included. This argument is ignored if --reset is specified. Roles include: • `back-end` - Filter on ports used to access storage devices that the system itself does I/O to. • `front-end` - Filter on ports used to make storage available to hosts. • `inter-director-communication` - Filter on ports used to communicate with other directors. • `local-com` - Filter on ports used to communicate with other directors at the same cluster. • `management` - Filter on ports used to communicate with the management server. • `wan-com` - Filter on ports used to communicate with other clusters.
[-r|--reset]	Reset the statistics counters of all ports at the specified director. If you specify this argument, the command ignores the --role argument.

Description

Displays statistics generated by the driver for FibreChannel ports at the specified director and optionally with the specified role, or resets those statistics.

Run this command from the `/clusters/cluster/directors/director` context to display the Fibre Channel statistics for the director in the current context.

Examples

Display a director's Fibre Channel port statistics from the root context:

```
VPlexcli:/> director fc-port-stats -d director-2-1-A
```

Reset the port statistics counters on a director's Fibre Channel ports from the root context:

```
VPlexcli:/> director fc-port-stats -d director-2-1-A --reset
```

Display a director's Fibre Channel port statistics from the director context:

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> fc-port-stat
Results for director 'director-2-1-A' at Fri Feb 10 16:10:15 MST 2012:
Port:                A1-FC00  A1-FC01  A1-FC02  A1-FC03  A3-FC00  A3-FC01
Frames:
- Discarded:         0        0                          0        0        0        0
- Expired:           0        0        0        0        0        0
- Bad CRCs:          0        0        0        0        0        0
- Encoding Errors:   0        0        0        0        0        0
```

```
- Out Of Order:                    0                    0           0
      0              0           0
- Lost:                            0              0           0              0
          0          13

Requests:
- Accepted:        0        0        0        0        7437     7437
- Rejected:        0        0        0        0        0        0
- Started:         0        0        0        0        7437     7437
- Completed:       0        0        0        0        7437     7437
- Timed-out:       0        0        0        0        0        0
Tasks:
- Received:        0        0        0        0        7437     7437
- Accepted:        0        0        0        0        7437     7437
- Rejected:        0        0        0        0        0        0
- Started:         0        0        0        0        7437     7437
- Completed:       0        0        0        0        7437     7437
- Dropped:         0        0        0        0        0        0
```

See also

- `monitor stat-list`

director firmware show-banks

Display the status of the two firmware banks for all or specified director(s).

Contexts

All contexts.

In `/clusters/cluster/directors` context, command is `firmware show-banks`.

Syntax

```
director firmware show-banks
```
`[-t|--targets]` *director*,*director*...

Arguments

Optional arguments	
`[-t|--targets]` *director*,*director*...	List of one or more names of directors. Display information only for the specified directors. Entries must be separated by commas.

Description

Show firmware status and version for one or more directors.

Table 7. director firmware show-banks field descriptions

Field	Description
`Banks`	Each director has two firmware banks; A and B.
`Status`	`active` - The software in this bank is currently operating on the director.

Table 7. director firmware show-banks field descriptions (continued)

Field	Description
	`inactive` - The software in this bank is not operating on the director.
`Marked for next reboot`	`no` - The software in this bank will not be used the next time the director reboots.
	`yes` - The software in this bank will be used the next time the director reboots.
`Director Software version`	Software version currently operating in the director.

Example

Show firmware banks for two specified directors:

```
VPlexcli:/clusters> director firmware show-banks --targets Cluster_1_Dir1A,
Cluster_1_Dir1B
[Director Cluster_1_Dir1B]:
Banks     Status     Marked for Next Reboot     Director Software Version
------     --------   ----------------------     -------------------------
Bank A    inactive   no                         1.2.43.0.0
Bank B    active     yes                        1.2.43.2.0
[Director Cluster_1_Dir1A]:
Banks     Status     Marked for Next Reboot     Director Software Version
------     --------   ----------------------     -------------------------
Bank A    inactive   no                         1.2.43.0.0
Bank B    active     yes                        1.2.43.2.0
```

See also

- `version`

director forget

Removes a director from the metro node.

Contexts

All contexts.

Syntax

```
director forget
[-n|--director] director uuid
```

Arguments

Required arguments	
`[-n|--director]` *director-uuid*	Director ID number. Use the `ll` command in `clusters/cluster/directors` context to display director ID numbers.

Description

Removes the specified director from the context tree. Deletes all information associated with the director.

Examples

In the following example:

- The `ll` command in clusters/cluster/directors context displays director IDs.
- The `director forget` command instructs metro node to delete all records pertaining to the specified director.

```
VPlexcli:/clusters/cluster-1/directors> ll
Name             Director ID        Cluster  Commissioned  Operational  Communication
---------------  -----------------  ID       ------------  Status       Status
---------------  -----------------  -------  ------------  -----------  -------------
Cluster_1_Dir1A  0x000000003ca00147  1        true          ok           ok
Cluster_1_Dir1B  0x000000003cb00147  1        true          ok           ok
VPlexcli:/clusters/cluster-1/directors> director forget --director 0x000000003ca00147
```

See also

- `director commission`
- `director decommission`

director passwd

Changes the access password for the specified director.

Contexts

All contexts.

In `/clusters/cluster/directors/director` context, command is `passwd`.

Syntax

director passwd

[-n|--director] *director*

[-c|--current-password] *current-password*

[-p|--new-password] *new-password*

Arguments

Required arguments	
`[-n|--director]` *director*	The remote director on which to change the access password.
`[-c|--current-password]` *current-password*	The current access password of the specified director.
`[-p|--new-password]` *new-password*	The new access password to set for the specified director.

Description

Changes the password for a specified director.

director ping

Displays the round-trip latency from a given director to the target machine, excluding any metro node overhead.

Contexts

All contexts.

In `/clusters/cluster/directors` context, command is `ping`.

Syntax

```
director ping
[-i|--ip-address] ip-address
[-n|--director] director
[-w|--wait] [1 - 2147483647]
```

Arguments

Required arguments	
`[-i|--ip-address]` *IP-address*	The target's IP address.
Optional arguments	
`[-n|--director]` *director*	The director from which to perform the operation.
`[-w|--wait]` *seconds*	Number of seconds to wait for a response. Range: 1 - 2147483647 Default: 5.

Description

ICMP traffic must be permitted between clusters for this command to work properly.

To verify that ICMP is enabled, log in to the shell on the management server and use the `ping` **IP-address** command where the IP address is for a director in the metro node.

If ICMP is enabled on the specified director, a series of lines is displayed:

```
service@ManagementServer:~> ping 128.221.252.36
PING 128.221.252.36 (128.221.252.36) 56(84) bytes of data.
64 bytes from 128.221.252.36: icmp_seq=1 ttl=63 time=0.638 ms
64 bytes from 128.221.252.36: icmp_seq=2 ttl=63 time=0.591 ms
64 bytes from 128.221.252.36: icmp_seq=3 ttl=63 time=0.495 ms
64 bytes from 128.221.252.36: icmp_seq=4 ttl=63 time=0.401 ms
64 bytes from 128.221.252.36: icmp_seq=5 ttl=63 time=0.552 ms
--- 128.221.252.36 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4002ms
rtt min/avg/max/mdev = 0.401/0.535/0.638/0.084 ms
```

If ICMP is disabled, nothing is displayed.

Press Ctrl-C to exit from `ping`.

Examples

`Ping` from root context:

```
VPlexcli:/> director  ping  -n  director-1-1-A -i  192.168.30.67
Round-trip time to 192.168.30.67: 0.111 ms
```

`Ping` from director context:

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> ping  192.168.30.68
Round-trip time to 192.168.30.68: 0.117 ms
```

Remote address is unreachable:

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> ping 128.221.252.36
128.221.252.36 is unreachable.
```

See also

- `director tracepath`

director shutdown

Starts the orderly shutdown of a director's firmware

Contexts

All contexts.

In `/clusters/cluster/directors` context, command is `shutdown`.

Syntax

```
director shutdown
[-f|--force]
[-n|--director] context-path
```

Arguments

Required arguments	
`[-f|--force]`	Forces this operation.
Optional arguments	
`[-n|--director]` *context-path*	* Director to shut down.

* - argument is positional.

Description

Shuts down the director firmware.

(i) **NOTE:** Does not shut down the operating system on the director.

After shutdown, state of the director is as follows:

- Power is on.
- Director OS running.
- Director firmware (GeoSynchrony) is stopped.

Examples

In the following example:

- The `director shutdown` command shuts down DirA.
- The `ll` command displays the shutdown director.

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> director shutdown --force
Please check the status of the director: director-1-1-A for its shutdown status.
Status    Description
--------  -----------------
Started.  Shutdown started.
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> ll
Attributes:
Name                             Value
-----------------------------    ------------------
auto-boot                        true
auto-restart                     true
.
.
.
marker-led                       off
operational-status               stopped
.
.
.
```

See also

- `cluster shutdown`
- `director commission`

director tracepath

Displays the route taken by packets from a specified director to the target machine.

Contexts

All contexts.

In `/clusters/cluster/directors` context, command is `tracepath`.

Syntax

`director tracepath`

`[-i|--ip-address]` *ip-address*

`[-n|--director]` *director*

Arguments

Required arguments	
`[-i|--ip-address]` *IP-address*	The target's IP address. This address is one of the Ethernet WAN ports on another director. Use the `ll port-group` command to display the Ethernet WAN ports on all directors.
Optional arguments	
`[-n|--director]` *director*	The name of the director from which to perform the operation. Can be either the director's name (for example director-1-1-A) or an IP address.

Description

Displays the hops, latency, and MTU along the route from the specified director to the target at the specified IP address.

The number of hops does not always correlate to the number of switches along the route. For example, a switch with a fire wall on each side is counted as two hops.

The reported latency at each hop is the round-trip latency from the source hop.

The MTU reported at each hop is limited by the MTU of previous hops and therefore not necessarily the configured MTU at that hop.

⚠ **CAUTION: If the target machine does not respond properly, the `traceroute` might stall. Run this command multiple times.**

See also

● `director ping`

director uptime

Prints the uptime information for all connected directors.

Contexts

All contexts.

In `clusters/cluster/directors` context, command is `uptime`.

Syntax

```
director uptime
```

Description

Uptime measures the time a machine has been up without any downtime.

Examples

Shows director uptime:

```
VPlexcli:/> director uptime
Director director-1-2-A: 0 days, 0 hours, 52 minutes, 29 seconds.
Director director-1-2-B: 0 days, 0 hours, 52 minutes, 11 seconds.
```

```
Director director-2-2-A: 0 days, 0 hours, 52 minutes, 19 seconds.
Director director-2-1-A: 0 days, 0 hours, 52 minutes, 34 seconds.
Director director-2-2-B: 0 days, 0 hours, 52 minutes, 31 seconds.
Director director-1-1-A: 0 days, 0 hours, 57 minutes, 2 seconds.
Director director-1-1-B: 0 days, 0 hours, 52 minutes, 24 seconds.
Director director-2-1-B: 0 days, 0 hours, 52 minutes, 28 seconds.
```

See also

- `cluster shutdown`
- `director firmware show-banks`

dirs

Displays the current context stack.

Contexts

All contexts.

Syntax

`dirs`

Description

The stack is displayed from top to bottom, in left to right order.

Examples

```
VPlexcli:/> dirs
[/]
VPlexcli:/> cd /clusters/cluster-1/
VPlexcli:/clusters/cluster-1> dirs
[/clusters/cluster-1]
VPlexcli:/clusters/cluster-1> cd /directors/
VPlexcli:/clusters/cluster-1/directors> dirs
[/clusters/cluster-1/directors]
```

See also

- `tree`

disconnect

Disconnects one or more connected directors.

Contexts

All contexts.

Syntax

```
disconnect
[-n|--directors] context-path, context-path...
```

Arguments

Required arguments	
`[-n|--directors]` *context-path*, *context-path...*	List of one or more remote directors from which to disconnect. Entries must be separated by commas.

Description

Stops communication from the client to the remote directors and frees up all resources that are associated with the connections.

> ⚠️ **CAUTION: Removes the entry in the connections file for the specified directors.**

This command is used in various procedures in the *Dell EMC Troubleshooting Guide*.

Examples

```
VPlexcli:> disconnect --directors /clusters/cluster-1/directors/director-1-1-B
```

See also

- `configuration virtual eng-register-vcenter-extensions`

dm migration cancel

Cancels an existing data migration.

Contexts

All contexts.

In all data-migration (device or extent) contexts, command is `migration cancel`.

In `data-migrations/extent-migrations` context, command is `cancel`.

Syntax

```
dm migration cancel
[-m|--migrations] context-path,context-path...
[-f|--force]
```

Arguments

Required arguments	
`[-m|--migrations]`	* List of one or more migrations to cancel. Entries must be separated by commas.
Optional arguments	
`[-f|--force]`	Forces the cancellation of the specified migrations.

* - argument is positional.

Description

Use the `dm migration cancel --force --migrations` *context-path* command to cancel a migration.

Specify the migration by name if that name is unique in the global namespace. Otherwise, specify a full context path.

Migrations can be canceled in the following circumstances:

- The migration is in progress or paused. The command stops the migration, and frees any resources it was using.
- The migration has not been committed. The command returns source and target devices or extents to their pre-migration state.

A migration cannot be canceled if it has been committed.

To remove the migration record from the context tree, see the `dm migration move` command.

Example

Cancel a migration from `device-migration` context:

```
VPlexcli:/data-migrations/device-migrations> dm migration cancel --force --migrations
migrate_012
```

Cancel a device migration from `root` context:

```
VPlexcli:> dm migration cancel --force --migrations /data-migrations/device-migrations/
migrate_012
```

See also

- `dm migration commit`
- `dm migration pause`
- `dm migration remove`
- `dm migration resume`
- `dm migration start`

dm migration clean

Cleans a committed data migration.

Contexts

All contexts.

In `/data-migrations` context, command is `migration clean`.

In `/data-migrations/device-migrations` context, command is `clean`.

In `/data-migrations/extent-migrations` context, command is `clean`.

Syntax

```
dm migration clean
[-m|--migrations] context-path,context-path...
[-f|--force]
[-e|--rename-target]
```

Arguments

Required arguments	
`[-m|--migrations]` *context-path,context-path...*	* List of one or more migrations to clean. Entries must be separated by commas.
Optional arguments	
`[-f|--force]`	Forces the cancellation of the specified migrations.
`[-e|--rename-target]`	For device migrations only, renames the target device after the source device. If the target device is renamed, the virtual volume on top of it is also renamed if the virtual volume has a system-assigned default name.

* - argument is positional.

Description

For device migrations, cleaning dismantles the source devices down to its storage volumes. The storage volumes no longer in use are unclaimed.

For device migrations only, use the `--rename-target` argument to rename the target device after the source device. If the target device is renamed, the virtual volume on top of it is also renamed if the virtual volume has a system-assigned default name.

Without renaming, the target devices retain their target names, which can make the relationship between volume and device less evident.

For extent migrations, cleaning destroys the source extent and unclaims the underlying storage volume if there are no extents on it.

Examples

```
VPlexcli:/data-migrations/device-migrations> dm migration clean --force --migrations
migrate_012
Cleaned 1 data migration(s) out of 1 requested migration(s).
```

See also

- `dm migration cancel`
- `dm migration commit`
- `dm migration pause`
- `dm migration remove`
- `dm migration resume`

● `dm migration start`

dm migration commit

Commits a completed data migration allowing for its later removal.

Contexts

All contexts.

In `/data-migrations` context, command is `migration commit`.

In `/data-migrations/extent-migrations` context, command is `commit`.

In `/data-migrations/device-migrations` context, command is `commit`.

Syntax

`dm migration commit`

`[-m|--migrations]` *context-path,context-path...*

`[-f|--force]`

Arguments

Required arguments	
`[-m|--migrations]` *context-path,context-path...*	* List of one or more migrations to commit. Entries must be separated by commas.
`[-f|--force]`	Forces the commitment of the specified migrations.

* - argument is positional.

Description

The migration process inserts a temporary RAID 1 structure above the source device/extent with the target device/extent as an out-of-date leg of the RAID 1. The migration can be understood as the synchronization of the out-of-date leg (the target).

After the migration is complete, the commit step detaches the source leg of the RAID 1 and removes the RAID 1.

The virtual volume, device or extent is identical to the one before the migration except that the source device/extent is replaced with the target device/extent.

A migration must be committed in order to be cleaned.

⚠ **CAUTION: Verify that the migration has completed successfully before committing the migration.**

Examples

Commit a device migration:

```
VPlexcli:/data-migrations/device-migrations> commit -m beta_device_mig1 -f
Committed 1 data migration(s) out of 1 requested migration(s).
```

See also

- dm migration cancel
- dm migration pause
- dm migration remove
- dm migration resume
- dm migration start

dm migration pause

Pauses the specified in-progress or queued data migrations.

Contexts

All contexts.

In `/data-migrations` context, command is `migration pause`.

In `/data-migrations/extent-migrations` context, command is `pause`.

In `/data-migrations/device-migrations` context, command is `pause`.

Syntax

```
dm migration pause
[-m|--migrations] context-path,context-path...
```

Arguments

Required arguments	
`[-m|--migrations]` context-path,context-path...	* List of one or more migrations to pause. Entries must be separated by commas.

* - argument is positional.

Description

Pause an active migration to release bandwidth for host I/O during periods of peak traffic.

Specify the migration by name if that name is unique in the global namespace. Otherwise, specify a full pathname.

Use the `dm migration resume` command to resume a paused migration.

Exsample

Pause a device migration:

```
VPlexcli:/data-migrations/device-migrations> dm migration pause --migrations migrate_012
```

See also

- dm migration cancel

- `dm migration commit`
- `dm migration remove`
- `dm migration resume`
- `dm migration start`

dm migration remove

Removes the record of canceled or committed data migrations.

Contexts

All contexts.

In `/data-migrations` context, command is `migration remove`.

In `/data-migrations/extent-migrations` context, command is `remove`.

In `/data-migrations/device-migrations` context, command is `remove`.

Syntax

```
dm migration remove
[-m|--migrations] context-path,context-path...
[-f|--force]
```

Arguments

Required arguments	
`[-m|--migrations]` *context-path,context-path...*	* List of one or more migrations to remove. Entries must be separated by commas.
`[-f|--force]`	Forces the removal of the specified migration(s).

* - argument is positional.

Description

Before a migration record can be removed, it must be canceled or committed to release the resources allocated to the migration.

Example

Remove a migration:

```
VPlexcli:/data-migrations/device-migrations> remove -m beta_device_mig1 -f
Removed 1 data migration(s) out of 1 requested migration(s).
```

See also

- `dm migration cancel`
- `dm migration commit`

- dm migration pause
- dm migration resume
- dm migration start

dm migration resume

Resumes a previously paused data migration.

Contexts

All contexts.

In `/data-migrations` context, command is `migration resume`.

In `/data-migrations/extent-migrations` context, command is `resume`.

In `/data-migrations/device-migrations` context, command is `resume`.

Syntax

dm migration resume

`[-m|--migrations]` *context-path,context-path...*

Arguments

Required arguments	
`[-m|--migrations]` *context-path,context-path...*	List of one or more migrations to resume. Entries must be separated by commas.

Description

Pause an active migration to release bandwidth for host I/O during periods of peak traffic.

Use the `dm migration resume` command to resume a paused migration.

Example

Resume a paused device migration:

```
VPlexcli:/data-migrations/device-migrations> dm migration resume --migrations migrate_012
```

See also

- dm migration cancel
- dm migration commit
- dm migration pause
- dm migration remove
- dm migration start

dm migration start

Starts the specified migration.

Contexts

All contexts.

In `/data-migrations` context, command is `migration start`.

in `/data-migrations/extent-migrations` context, command is `start`.

in `/data-migrations/device-migrations` context, command is `start`.

Syntax

`[-n|--name]` *migration-name...*

`[-f|--from]` {*source-extent*|*source-device*}

`[-t|--to]` {*target-extent*|*target-device*}

`[-s|--transfer-size]` *value*

`--paused`

`--force`

Arguments

Required arguments	
`[-n|--name]` *migration-name...*	* Name of the new migration. Used to track the migration's progress, and to manage (cancel, commit, pause, resume) the migration.
`[-f|--from]` {*source-extent*|*source-device*}	* The name of source extent or device for the migration. Specify the source device or extent by name if that name is unique in the global namespace. Otherwise, specify a full pathname. If the source is an extent, the target must also be an extent. If the source is a device, the target must also be a device.
`[-t|--to]` {*target-extent*|*target-device*}	* The name of target extent or device for the migration. Specify the target device or extent by name if that name is unique in the global namespace. Otherwise, specify a full pathname.
Optional arguments	
`[-s|--transfer-size]` *value*	Maximum number of bytes to transfer per operation per device. A bigger transfer size means smaller space available for host I/O. Must be a multiple of 4 K. Range: 40 KB - 128 M. Default: 128 K. If the host I/O activity is very high, setting a large transfer size may impact host I/O. See About transfer-size in the batch-migrate start command.
`--paused`	Starts the migration in a paused state.
`--force`	Do not ask for confirmation. Allows this command to be run using a non-interactive script.

* - argument is positional.

Description

Starts the specified migration. If the target is larger than the source, the extra space on the target is unusable after the migration. If the target is larger than the source, a prompt to confirm the migration is displayed.

Up to 25 local and 25 distributed migrations (rebuilds) can be in progress at the same time. Any migrations beyond those limits are queued until an existing migration completes.

Extent migrations - Extents are ranges of 4K byte blocks on a single LUN presented from a single back-end array. Extent migrations move data between extents in the same cluster. Use extent migration to:

● Move extents from a "hot" storage volume shared by other busy extents,
● De-fragment a storage volume to create more contiguous free space,
● Support technology refreshes.

Start and manage extent migrations from the extent migration context:

```
VPlexcli:/> cd /data-migrations/extent-migrations/
VPlexcli:/data-migrations/extent-migrations>
```

ⓘ **NOTE:** Extent migrations are blocked if the associated virtual volume is undergoing expansion. See the `virtual-volume expand` command.

Device migrations - Devices are RAID 0, RAID 1, or RAID C built on extents or other devices. Devices can be nested; a distributed RAID 1 can be configured on top of two local RAID 0 devices. Device migrations move data between devices on the same cluster or between devices on different clusters. Use device migration to:

● Migrate data between dissimilar arrays
● Relocate a hot volume to a faster array

This command can fail on a cross-cluster migration if there is not a sufficient number of meta volume slots. See the troubleshooting section of the metro node procedures in the SolVe Desktop for a resolution to this problem.

Start and manage device migrations from the device migration context:

```
VPlexcli:/> cd /data-migrations/device-migrations/
VPlexcli:/data-migrations/device-migrations>
```

When running the `dm migration start` command across clusters, you might receive the following error message:

```
VPlexcli:/> dm migration start -f SveTest_tgt_r0_case2_1_0002 -t
SveTest_src_r0_case2_2_0002 -n cc2
The source device 'SveTest_tgt_r0_case2_1_0002' has a volume
'SveTest_tgt_r0_case2_1_0002_vol' in a view. Migrating to device
'SveTest_src_r0_case2_2_0002' will create a synchronous distributed device. In this GEO
system, this can increase the per I/O latency on 'SveTest_tgt_r0_case2_1_0002_vol'. If
applications using 'SveTest_tgt_r0_case2_1_0002_vol' are sensitive to this latency, they
may experience data unavailability.  Do you wish to proceed ? (Yes/No) y
dm migration start:  Evaluation of <<dm migration start -f SveTest_tgt_r0_case2_1_0002
-t SveTest_src_r0_case2_2_0002 -n cc2>> failed.
cause:                             Failed to create a new data-migration.
cause:                             Unable to attach mirror
'SveTest_src_r0_case2_2_0002' to distributed Device 'MIGRATE_cc2'.
cause:                             Firmware command error.
cause:                             Active metadata device does not have a free slot.
```

See the troubleshooting section of the metro node procedures in the SolVe Desktop for instructions on increasing the number of slots.

Prerequisites for target devices/extents

The target device or extent of a migration must:

● Be the same size or larger than the source device or extent

  If the target is larger in size than the source, the extra space cannot be utilized. For example, if the source is 200 GB, and the target is 500 GB, only 200 GB of the target can be used after a migration. The remaining 300 GB cannot be claimed.

● Not have any existing volumes on it.

See the Dell EMC Administration Guide for metro node for detailed information on data migration.

See also

- batch-migrate create-plan
- batch-migrate start
- dm migration cancel
- dm migration commit
- dm migration pause
- dm migration remove
- dm migration resume

drill-down

Displays the components of a view, virtual volume or device, down to the storage-volume context.

Contexts

All contexts.

Syntax

```
drill-down
[-v|--storage-view] context-path,context-path...
[-o|--virtual-volume] context-path,context-path...
[-r|--device] context-path,context-path...
```

Arguments

Required arguments	
[-v|--storage-view] *context-path,context-path...*	List of one or more views to drill down. Entries must be separated by commas. Glob style pattern matching is supported.
[-o|--virtual-volume] *context-path,context-path...*	List of one or more virtual volumes to drill down. Entries must be separated by commas. Glob style pattern matching is supported.
[-r|--device] *context-path,context-path...*	List of one or more devices to drill down. Entries must be separated by commas. Glob style pattern matching is supported.

Description

Displays the components of the specified object.

To display a list of available objects, use the drill-down *object-type* command followed by the <TAB> key, where object type is storage-view, device, or virtual-volume.

Examples

Display the components of a virtual volume:

```
VPlexcli:/clusters/cluster-2> drill-down --virtual-volume dd_21_vol/
virtual-volume: dd_21_vol (cluster-2)
```

```
   distributed-device: dd_21
      distributed-device-component: dev1723_614 (cluster-2)
         extent: extent_Symm1723_614_1
            storage-volume: Symm1723_614 (blocks: 0 - 4195199)
      distributed-device-component: dev1852_214 (cluster-1)
         extent: extent_Symm1852_214_1
            storage-volume: Symm1852_214 (blocks: 0 - 4195199)
```

Display the elements of a storage view:

```
VPlexcli:/clusters/cluster-2> drill-down --storage-view exports/storage-views/LicoJ010
storage-view: LicoJ010 (cluster-2)
   virtual-volume: base01_vol (cluster-2)
      local-device: base01 (cluster-2)
         extent: extent_base_volume_1
            storage-volume: base_volume (blocks: 0 - 524287)
   virtual-volume: dd_00_vol (cluster-2)
      distributed-device: dd_00
         distributed-device-component: dev1723_00 (cluster-1)
            extent: extent_Symm1723_200_1
               storage-volume: Symm1723_200 (blocks: 0 - 4195199)
            extent: extent_Symm1723_204_1
               storage-volume: Symm1723_204 (blocks: 0 - 4195199)
            extent: extent_Symm1723_208_1
               storage-volume: Symm1723_208 (blocks: 0 - 4195199)
            extent: extent_Symm1723_20C_1
               storage-volume: Symm1723_20C (blocks: 0 - 4195199)
.
.
.
virtual-volume: dev_Symm1723_91C_vol (cluster-2)
      local-device: dev_Symm1723_91C (cluster-2)
         extent: extent_Symm1723_91C_1
            storage-volume: Symm1723_91C (blocks: 0 - 4195199)
   iport: LicoJ010_hba1
   iport: LicoJ010_hba0
   iport: LicoJ010_hba3
   iport: LicoJ010_hba2
   tport: P000000003CB000E6-B1-FC00
   tport: P000000003CB001CB-B0-FC00
   tport: P000000003CA001CB-A0-FC00
   tport: P000000003CA000E6-A0-FC00
   tport: P000000003CB001CB-B1-FC00
   tport: P000000003CB000E6-B0-FC00
   tport: P000000003CA001CB-A1-FC00
   tport: P000000003CA000E6-A1-FC0
```

Display the components of a device:

```
VPlexcli:/clusters/cluster-2/devices> drill-down --device dev_Symm1723_918
local-device: dev_Symm1723_918 (cluster-2)
   extent: extent_Symm1723_918_1
      storage-volume: Symm1723_918 (blocks: 0 - 4195199)
```

See also

- tree

ds dd convert-to-local

To convert a distributed device to a local device, this command detaches the leg that is not on the specified cluster.

Context

All contexts

Syntax

```
ds dd convert-to-local
   [-h | --help]
   [-v | --verbose]
   [[-c | --cluster = ]cluster-context]
   [-f | --force]
   [[-d | --distributed-device=] distributed device]
```

Arguments

Optional arguments	
-h	--help	Displays the usage for this command. --verbose Provides more output during command execution. This may not have any effect for some commands.
-c	--cluster= cluster context	Specifies the context path of the cluster where the distributed device will be local. If the device is exported to any cluster it must be the chosen cluster.
-f	--force	Forces the command to proceed, bypassing all user warnings. positional arguments Specifies the distributed device to make local.
-d	--distributed-device= context path	Specifies the context path of the distributed device to make local.

The remaining leg becomes the supporting device of the virtual volume. The target device should NOT be migration temporary device and should not be exported to any other cluster than the specified cluster. For distributed devices that are part of a consistency-group please refer to the `connsistency-group convert-local` command.

ds dd create

Creates a new distributed-device.

Contexts

All contexts.

Syntax

```
ds dd create

[-n|name] name

[-d|--devices] context-path [,contextpath,...]

[-l|--logging-volumes] context-path [,context-path,...]

[-r| rule-set] rule-set

[-s|--source-leg] context-path

[-f|--force]
```

Arguments

Required arguments	
[-n|--name] name	* The name of the new distributed device. Must be unique across the metro node.

`[-d|--devices]` *context-path* [, *context-path*,...]	* List of one or more local devices that will be legs in the new distributed device.
`[-l|--logging-volume]` *context-path* [, *context-path*,...]	List of one or more logging volumes to use with this device. If no logging volume is specified, a logging volume is automatically selected from any available logging volume that has sufficient space for the required entries. If no available logging volume exists, an error message is returned.
Optional arguments	
`[-r|--rule-set]` *rule-set*	The rule-set to apply to the new distributed device. If the `--rule-set` argument is omitted, the cluster that is local to the management server is assumed to be the winner in the event of an inter-cluster link failure.
`[-s|--source-leg]` *context-path*	Specifies one of the local devices to use as the source data image for the new device. The command copies data from the source-leg to the other legs of the new device.
`[-f|--force]`	Forces a rule-set with a potential conflict to be applied to the new distributed device.

* - argument is positional.

Description

The new distributed device consists of two legs; local devices on each cluster.

⚠ **WARNING: Without `--source-leg`, a device created by this command does not initialize its legs, or synchronize the contents of the legs. Because of this, consecutive reads of the same block may return different results for blocks that have never been written. Host reads at different clusters are almost certain to return different results for the same unwritten block, unless the legs already contain the same data. Do not use this command without `--source-leg` unless you plan to initialize the new device using host tools**

⚠ **CAUTION: Use this command only if the resulting device will be initialized using tools on the host.**
Do not use this command if one leg of the resulting device contains data that must be preserved. Applications using the device may corrupt the pre-existing data.

To create a device when one leg of the device contains data that must be preserved, use the `device attach-mirror` command to add a mirror to the leg. The data on the leg will be copied automatically to the new mirror.

The individual local devices may include any underlying type of storage volume or geometry (RAID 0, RAID 1, or RAID C), but they should be the same capacity.

If a distributed device is configured with local devices of different capacities:

● The resulting distributed device is only as large as the smaller local device
● The leftover capacity on the larger device is not available

To create a distributed device without wasting capacity, choose local devices on each cluster with the same capacity.

The geometry of the new device is automatically RAID 1.

Each cluster in the metro node can contribute a maximum of one component device to the new distributed device.

This command can fail if there is not a sufficient number of meta volume slots. See the troubleshooting section of the metro node procedures in the SolVe Desktop for a resolution to this problem.

⚠ **CAUTION: If there is pre-existing data on a storage-volume, and the storage-volume is not claimed as being application consistent, converting an existing local RAID device to a distributed RAID using the `ds dd create` command will not initiate a rebuild to copy the data to the other leg. Data will exist at only one cluster. To prevent this, do one of the following:**

1. **Claim the disk with data using the application consistent flag**
2. **Create a single-legged RAID 1 or RAID 0 and add a leg using the device attach-mirror command.**

Use the `set` command to enable/disable automatic rebuilds on the distributed device. The rebuild setting is immediately applied to the device.

● `set rebuild-allowed true` starts or resumes a rebuild if mirror legs are out of sync.

- `set rebuild-allowed false` stops a rebuild in progress.

When set to `true`, the rebuild continues from the point where it was halted. Only those portions of the device that have not been rebuilt are affected. The rebuild does not start over.

Examples

In the following example, the `ds dd create` command creates a new distributed device with the following attributes:

- Name: ExchangeDD
- Devices:
  - /clusters/cluster-2/devices/s6_exchange
  - /clusters/cluster-1/devices/s8_exchange
- Logging volumes:
  - /clusters/cluster-1/system-volumes/cluster_1_loggingvol
  - /clusters/cluster-2/system-volumes/cluster_2_loggingvol
- Rule-set: rule-set-7a

```
VPlexcli:/distributed-storage/distributed-devices> ds dd create --
name ExchangeDD --devices /clusters/cluster-2/devices/s6_exchange,/clusters/
cluster-1/devices/s8_exchange --logging-volumes /clusters/cluster-1/system-volumes/
cluster_1_loggingvol,/clusters/cluster-2/system-volumes/cluster_2_loggingvol --rule-
set rule-set-7a
```

In the following example, the `ds dd create` command creates a distributed device, and with the default rule-set:

```
VPlexcli:/> ds dd create --name TestDisDevice --devices /clusters/cluster-1/devices/
TestDevCluster1, /clusters/cluster-2/devices/TestDevCluster2
Distributed-device 'TestDisDevice' is using rule-set 'cluster-2-detaches'.
```

See also

- `device attach-mirror`
- `ds dd destroy`
- `local-device create`

ds dd declare-winner

Declares a winning cluster for a distributed-device that is in conflict after a link outage.

Contexts

All contexts.

In `/distributed-storage/distributed-device` context, command is `declare-winner`.

In `/distributed-storage` context, command is `dd declare-winner`.

Syntax

```
ds dd declare-winner
[
-c|--cluster] context-path
[-d|--distributed-device] context-path
[-f|--force]
```

Arguments

Required arguments	
[-c|--cluster] *context-path*	* Specifies the winning cluster.
[-d|--distributed-device] *context-path*	Specifies the distributed device for which to declare a winning cluster.
[-f|--force]	Forces the `declare-winner` command to be issued.

* - argument is positional.

Description

If the legs at two or more clusters are in conflict, use the ds dd declare-winner command to declare a winning cluster for a specified distributed device.

Examples

```
VPlexcli:/distributed-storage/distributed-devices> ds dd declare-winner --distributed-
device DDtest_4 --cluster cluster-2 --force
```

See also

- `ds dd create`

ds dd destroy

Destroys the specified distributed-device(s).

Contexts

All contexts.

Syntax

```
ds dd destroy
[-d|--distributed-device] context-path, context-path,...
[-f|--force]
```

Arguments

Required arguments	
[-d|--distributed-device] *context-path*, *context-path*,...	* List of one or more distributed devices to destroy.
[-f|--force]	Forces the distributed devices to be destroyed.

* - argument is positional.

Description

In order to be destroyed, the target distributed device must not host virtual volumes.

Examples

```
VPlexcli:/distributed-storage/distributed-devices> ds dd destroy /distributed-storage/
distributed-devices/TestDisDevice
WARNING: The following items will be destroyed:
Context
-------------------------------------------------------
/distributed-storage/distributed-devices/TestDisDevice
Do you wish to proceed? (Yes/No) yes
```

See also

- `ds dd create`

ds dd remove-all-rules

Removes all rules from all distributed devices.

Contexts

All contexts.

Syntax

```
ds dd remove-all-rules
[
-f|--force]
```

Arguments

Optional arguments	
`[-f|--force]`	Force the operation to continue without confirmation.

Description

From any context, removes all rules from all distributed devices.

⚠️ WARNING: **There is NO undo for this procedure.**

Examples

```
VPlexcli:/distributed-storage/distributed-devices/dd_23> remove-all-rules
All the rules in distributed-devices in the system will be removed. Continue? (Yes/No)
yes
```

See also

- `ds rule destroy`
- `ds rule island-containing`
- `ds rule-set copy`
- `ds rule-set create`
- `ds rule-set destroy`
- `ds rule-set what-if`

ds dd set-log

Allocates/unallocates segments of a logging volume to a distributed device or a component of a distributed device.

Contexts

All contexts.

Syntax

```
ds dd set-log
```

[-d|--distributed devices] *context-path,context-path...*

[-c|--distributed-device-component] *context-path*

[-l|--logging-volumes] *context-path,context-path...*

[-n|--cancel]

Arguments

Required arguments	
`[-d|--distributed-devices]` *context-path, context-path...*	One or more distributed devices for which segments of the specified logging volume are allocated/unallocated. All components of the distributed-device are included.
`[-c|--distributed-device-component]` *context-path*	The distributed device component for which segments of the specified logging volume are allocated/unallocated.
`[-l|--logging-volume]` *context-path, context-path...*	One or more logging-volumes where the logging volume segments are allocated/unallocated. The target volume must be created as *logging-volume*. If not specified, the metro node configuration automatically allocates a logging volume for each cluster.
Optional arguments	
`[-n|--cancel]`	Cancel/unallocate the log setting for the specified component of a distributed device or all the components of the specified distributed device. ⚠ **WARNING: Use the `--cancel` argument very carefully.** **the command issues a warning message if you attempt to cancel logging volumes on a distributed device.** **Removing the logging-volume for a device deletes the existing logging entries for**

	that device. A FULL rebuild of the device occurs after a link failure and recovery. Removing the logging volume for all distributed devices removes all entries from the logging volume. In the event of a link failure and recovery, this results in a FULL rebuild of all distributed devices.

Description

Logging volumes keep track of 4 k byte blocks written during an inter-cluster link failure. When the link recovers, metro node uses the information in logging volumes to synchronize the mirrors.

⚠️ **WARNING: If no logging volume is allocated to a distributed device, a full rebuild of the deviceoccurs when the inter-cluster link is restored after an outage.**

Do not change a device's logging volume unless the existing logging-volume is corrupted or unreachable, or to move the logging volume to a new disk.

Use the `ds dd set-log` command only to repair a corrupted logging volume or to transfer logging to a new disk.

Use the `--distributed-devices` argument to allocate/unallocate segments on the specified logging volume to the specified device.

Use the `--distributed-devices-component` argument to allocate/unallocate segments on the specified logging volume to the specified device component.

ⓘ **NOTE:** Specify either distributed devices or distributed device components. Do not mix devices and components in the same command.

If the logging volume specified by the `--logging-volume` argument does not exist, it is created.

Use the `--cancel` argument to delete the log setting for a specified device or device component.

This command can fail if there is not a sufficient number of meta volume slots. See the troubleshooting procedures for metro node in the SolVe Desktop for a resolution to this problem.

Examples

Allocate segments of a logging volume to a distributed device:

```
VPlexcli:/distributed-storage/distributed-devices/TestDisDevice> ds dd set-log --
distributed-devices TestDisDevice --logging-volumes /clusters/cluster-2/system-volumes/
New-Log_Vol
```

Remove the logging volume for a distributed device:

```
VPlexcli:/distributed-storage/distributed-devices/TestDisDevice> ds dd set-log --
distributed-devices TestDisDevice --cancel
```

Attempt to cancel a logging volume for a distributed device that is not fully logged:

⚠️ **WARNING: Issuing the cancel command on a distributed device that is not fully logged results in a warning message.**

```
VPlexcli:/distributed-storage/distributed-devices/dr1_C12_0249> ds dd set-log --
distributed-devices dr1_C12_0249 --cancel
WARNING: This command will remove the logging segments from distributed device
'dr1_C12_0249'.
If a distributed device is not fully logged, it is vulnerable to full rebuilds
following
inter-cluster WAN link failure or cluster failure.
It is recommended that the removed logging-segments be restored as soon as possible.
```

See also

- `logging-volume create`

ds rule destroy

Destroys an existing rule.

Contexts

All contexts.

In `/distributed-storage` context, command is `rule destroy`.

Syntax

```
ds rule destroy
[
-r|--rule] rule
```

Arguments

Required arguments	
`[-r|--rule]` *rule*	Specifies the rule to destroy.

Description

A rule-set contains rules. Use the ll command in the rule-set context to display the rules in the rule-set.

Examples

Use the ds rule destroy command to destroy a rule in the rule set.

```
VPlexcli:/distributed-storage/rule-sets/ruleset_recreate5/rules> ll
RuleName   RuleType           Clusters   ClusterCount  Delay  Relevant
--------   -----------------  ---------  ------------  -----  --------
rule_1     island-containing  cluster-1  2             10s    true
VPlexcli:/distributed-storage/rule-sets/ruleset recreate5/rules> rule destroy rule_1
```

See also

- `ds rule island-containing`
- `ds rule-set copy`
- `ds rule-set create`
- `ds rule-set destroy`
- `ds rule-set what-if`

ds rule island-containing

Adds a island-containing rule to an existing rule-set.

Contexts

All contexts.

In `/distributed-storage` context, command is `rule island-containing`.

Syntax

```
ds rule island-containing
```

[-c|--clusters] *context-path,context-path...*
[-d|--delay] delay
[-r|rule-set] context path

Arguments

Required arguments	
`[-c|--clusters]` *context-path*, *context-path...*	* Clusters to which this rule applies.
`[-d|--delay]` *delay*	* Sets the delay after a link outage before the rule is applied. Values must a positive integer and end with one of the following units: `min` - delay timer in seconds `s` - delay timer in seconds (default unit) `h` - delay timer in hours
[-r|--rule-set]	Rule-set to which this rule is added.

* - argument is positional.

Description

Describes when to resume I/O on all clusters in the island containing the specified cluster.

Example

In the following example, the `rule island-containing` command creates a rule that dictates:

1. Metro node waits for 10 seconds after a link failure and then:
2. Resumes I/O to the island containing cluster-1,
3. Detaches any other islands.

```
VPlexcli:/distributed-storage/rule-sets/TestRuleSet/rules> ds rule island-containing --
clusters cluster-1 --delay 10s
VPlexcli:/distributed-storage/rule-sets/TestRuleSet/rules> ll
RuleName   RuleType           Clusters    ClusterCount   Delay   Relevant
--------   ----------------   ---------   ------------   -----   --------
rule_1     island-containing  cluster-1   -              10s     true
```

See also

- `ds dd remove-all-rules`
- `ds rule destroy`
- `ds rule-set copy`
- `ds rule-set create`
- `ds rule-set destroy`
- `ds rule-set what-if`

ds rule-set copy

Copy an existing rule-set.

Contexts

All contexts.

In `/distributed-storage/rule-sets` context, command is `copy`.

In `/distributed-storage` context, command is `rule-set copy`.

Syntax

`ds rule-set copy`

`[-s|--source]` *rule-set*

`[-d|--destination]` *new-rule-set*

Arguments

Required arguments	
`[-s|--source]` *rule-set*	* Source rule-set.
`[-d|--destination]` *new-rule-set*	The destination rule-set name.

* - argument is positional.

Description

Copies an existing rule-set and assigns the specified name to the copy.

Example

```
VPlexcli:/distributed-storage/rule-sets> ll
Name                PotentialConflict  UsedBy
------------------  -----------------  ----------------------------------------
TestRuleSet         false
VPlexcli:/distributed-storage/rule-sets> rule-set copy --source TestRuleSet --
destination  CopyOfTest
VPlexcli:/distributed-storage/rule-sets> ll
Name                PotentialConflict  UsedBy
------------------  -----------------  ----------------------------------------
CopyOfTest          false
TestRuleSet         false
```

See also

- `ds dd remove-all-rules`
- `ds rule destroy`
- `ds rule island-containing`
- `ds rule-set create`
- `ds rule-set destroy`
- `ds rule-set what-if`

ds rule-set create

Creates a new rule-set with the given name and encompassing clusters.

Contexts

All contexts.

In `/distributed-storage/rule-sets` context, command is `create`.

In `/distributed-storage` context, command is `rule-set create`.

Syntax

```
ds rule-set create

[-n|--name] rule-set
```

Arguments

Required arguments	
`[-n|--name]` *rule-set*	Name of the new rule-set.

Examples

Create a rule-set:

```
VPlexcli:/> ds rule-set create --name TestRuleSet

Name            PotentialConflict   UsedBy
-------------   -----------------   ------
TestRuleSet     false
```

See also

- `ds dd remove-all-rules`
- `ds rule destroy`
- `ds rule island-containing`
- `ds rule-set copy`
- `ds rule-set create`
- `ds rule-set destroy`
- `ds rule-set what-if`

- `set`

ds rule-set destroy

Destroys an existing rule-set.

Contexts

All contexts.

In `/distributed-storage/rule-sets` context, command is `destroy`.

In `/distributed-storage` context, command is `rule-set destroy`.

Syntax

```
ds rule-set destroy
[-r|--rule-set] rule-set
```

Arguments

Required arguments	
`[-r|--rule-set]` *rule-set*	Name of the rule-set to destroy.

Description

Deletes the specified rule-set. The specified rule-set can be empty or can contain rules.

Before deleting a rule-set, use the `set` command to detach the rule-set from any virtual volumes associated with the rule-set.

Examples

Delete a rule-set:

```
VPlexcli:/distributed-storage/rule-sets/NewRuleSet> ds rule-set destroy NewRuleSet
Context '/distributed-storage/rule-sets/NewRuleSet' has been removed.
```

In the following example:

- The `ll` command displays to which devices the rule-set is attached.
- The `set rule-set name ""` command detaches the rule set from a device.
- The `ds rule-set destroy` command deletes the rule-set.

```
VPlexcli:/distributed-storage/rule-sets/TestRuleSet> ll
Attributes:
Name               Value
-----------------  -----------------------
key                ruleset_5537985253109250
potential-conflict  false
used-by             dd_00
VPlexcli:/distributed-storage/rule-sets/TestRuleSet> cd //distributed-storage/
distributed-devices/dd_00
VPlexcli:/distributed-storage/distributed-devices/dd_00>set rule-set-name ""
Removing the rule-set from device 'dd_00' could result in data being unavailable
during a WAN link outage.  Do you wish to proceed ? (Yes/No) yes
```

```
VPlexcli:/distributed-storage/distributed-devices/dd_00>ds rule-set destroy
TestRuleSet
```

See also

- `ds dd remove-all-rules`
- `ds rule destroy`
- `ds rule island-containing`
- `ds rule-set copy`
- `ds rule-set create`
- `ds rule-set what-if`
- `set`

ds rule-set what-if

Tests if/when I/O is resumed at individual clusters, according to the current rule-set.

Contexts

All contexts.

In `/distributed-storage/rule-sets` context, command is `what-if`.

In `/distributed-storage` context, command is `rule-set what-if`.

Syntax

`ds rule-set what-if`

`[-i|--islands]` "*cluster-1,cluster-2*"

`[-r|--rule-set]` *context-path*

Arguments

Required arguments	
`[-i|--islands]` "*cluster-1,cluster-2*"	List of islands, in quotes. The clusters are separated by commas, the islands by a space.
`[-r|--rule-set]` *context-path*	Context path of the rule-set used in the what-if scenario.

Description

This command supports only two clusters and one island.

Examples

Test a rule-set:

```
VPlexcli:/distributed-storage/rule-sets> ds rule-set what-if --islands
"cluster-1,cluster-2" --rule-set TestRuleSet
IO does not stop.
```

See also

- `ds dd remove-all-rules`
- `ds rule destroy`
- `ds rule island-containing`
- `ds rule-set copy`
- `ds rule-set create`
- `ds rule-set destroy`

ds summary

Display summary information about distributed devices.

Contexts

All contexts.

In `/distributed-storage` context, command is `summary`.

Syntax

```
ds summary
```

Description

Displays summarized information for all distributed-devices.

Displays more detailed information for any device with a `health-state` or `operational-status` other than `ok`, and a `service-status` other than `running`.

Displays devices per cluster, and calculates total and free capacity.

Use the `--verbose` argument to display additional information about unhealthy volumes in each consistency group.

Table 8. ds summary field descriptions

Field	Description
Distributed Volumes (not in Consistency Groups) Unhealthy Summary:	
`Device Name`	Name of the device.
`Health State`	`major failure` - One or more children of the distributed device is out-of-date and will never rebuild, possibly because they are dead or unavailable. `minor failure` - Either one or more children of the distributed device is out-of-date and will rebuild, or the Logging Volume for the distributed device is unhealthy. `non-recoverable error` - Metro node cannot determine the distributed device's Health state. `ok` - The distributed device is functioning normally. `unknown` - Metro node cannot determine the device's health state, or the state is invalid.
`Operational Status`	`degraded` - The distributed device may have one or more out-of-date children that will eventually rebuild. `error` - One or more components of the distributed device is hardware-dead.

Table 8. ds summary field descriptions (continued)

Field	Description
	• `ok` - The distributed device is functioning normally. • `starting` - The distributed device is not yet ready. • `stressed` - One or more children of the distributed device is out-of-date and will never rebuild. • `unknown` - Metro node cannot determine the distributed device's Operational state, or the state is invalid.
Service Status	`cluster unreachable` - Metro node cannot reach the cluster; the status is unknown. `need resume` - The other cluster detached the distributed device while it was unreachable. The distributed device needs to be manually resumed for I/O to resume at this cluster. `need winner` - All clusters are reachable again, but both clusters had detached this distributed device and resumed I/O. You must pick a winner cluster whose data will overwrite the other cluster's data for this distributed device. `potential conflict` - The clusters have detached each other resulting in a potential for detach conflict. `running` - The distributed device is accepting I/O. `suspended` - The distributed device is not accepting new I/O; pending I/O requests are frozen. `winner-running` - This cluster detached the distributed device while the other cluster was unreachable, and is now sending I/O to the device.
Cluster Summary	Number of distributed devices on each cluster.
Capacity Summary	Number of devices with free capacity, amount of free capacity for the cluster, and total capacity for all clusters.
Distributed volumes (in consistency groups) unhealthy summary:	
CG Name	Name of the consistency group of which the unhealthy device is a member.
Cache Mode	Cache mode of the consistency group. `Synchronous` - Supported on metro node Local and metro node Metro configurations where clusters are separated by up to 5 ms of latency. In synchronous cache mode, writes to the back-end storage volumes are not acknowledged to the host until the back-end storage volumes acknowledge the write.
Number of unhealthy volumes	Number of unhealthy volumes in the consistency group.
Cluster	Visibility of the consistency group. • `cluster-1` - consistency group is visible only at cluster-1. • `cluster-2` - consistency group is visible only at cluster-2. • `cluster-1, cluster-2` - consistency group is visible at both clusters.
Operational Status	Current status for this consistency group with respect to each cluster on which it is visible. • `ok` - I/O can be serviced on the volumes in the consistency group. • `suspended` - I/O is suspended for the volumes in the consistency group. The reasons are described in the `operational status: details`.

Table 8. ds summary field descriptions (continued)

Field	Description
	• `degraded` - I/O is continuing, but there are other problems described in `operational status: details`. • `unknown` - The status is unknown, likely because of lost management connectivity.

`Status Details`	If operational status is `ok` this field is empty: "`[ ]`". Otherwise, it displays additional information, which may be any of the following:
	• `requires-resolve-conflicting-detach` - After the inter-cluster link is restored, two clusters have discovered that they have detached one another and resumed I/O independently. The clusters are continuing to service I/O on their independent versions of the data. The consistency-group resolve-conflicting-detach command must be used to make the view of data consistent again at the clusters.
	• `rebuilding-across-clusters` - One or more distributed member volumes is being rebuilt. At least one volume in the group is out of date at that cluster and is re-syncing. If the link goes out at this time the entire group is suspended. Use the `rebuild status` command to display which volume is out of date at which cluster.
	• `rebuilding-within-cluster` - One or more local rebuilds is in progress at this cluster.
	• `data-safe-failure` - A single director has failed. The volumes are still crash-consistent, and will remain so, unless a second failure occurs before the first is recovered.
	• `requires-resume-after-data-loss-failure` - There have been at least two concurrent failures, and data has been lost. For example, a director fails shortly after the inter-cluster link fails, or when two directors fail at almost the same time. Use the `consistency-group resume-after-data-loss-failure` command to select a winning cluster and allow I/O to resume.
	• `cluster-departure` - Not all the visible clusters are in communication.
	• `requires-resume-after-rollback` - A cluster has detached its peer cluster and rolled back the view of data, but is awaiting the `consistency-group resume-after-rollback` command before resuming I/O. Displayed:
	  ○ At the winning side when a detach rule fires, or shortly after the `consistency-group choose-winner` command picks a winning cluster.
	
	    `requires-resume-at-loser` - Displayed on the losing side when the inter-cluster link heals after an outage. After the inter-cluster link is restored, the losing cluster discovers that its peer was declared the winner and resumed I/O. Use the `consistency-group resume-at-loser` command to make the view of data consistent with the winner, and to resume I/O at the loser.
	
	    `restore-link-or-choose-winner` - I/O is suspended at all clusters because of a cluster

Table 8. ds summary field descriptions (continued)

Field	Description
	departure, and cannot automatically resume. This can happen if:
	○ There is no detach-rule
	○ If the detach-rule is `no-automatic-winner`, or
	○ If the detach-rule cannot fire because its conditions are not met.
	For example, if more than one cluster is active at the time of an inter-cluster link outage, the `active-cluster-wins` rule cannot take effect. When this detail is present, I/O will not resume until either the inter-cluster link is restored, or the user intervenes to select a winning cluster with the `consistency-group choose-winner` command.
	`unhealthy-devices` - I/O has stopped in this consistency group because one or more volumes is unhealthy and cannot perform I/O.
	`will-rollback-on-link-down` - If there were a link-down now, the winning cluster would have to roll back the view of data in order to resume I/O.

Examples

Display summary information when no devices are unhealthy:

```
VPlexcli:/distributed-storage> ds summary
Slot usage summary:
    Total 912 slots used by distributed device logging segments.
Distributed devices health summary:
                  Total 25 devices, 0 unhealthy.
Cluster summary:
                  Cluster cluster-2 : 25 distributed devices.
                  Cluster cluster-1 : 25 distributed devices.
Capacity summary:
                  0 devices have some free capacity.
                  0B free capacity of 500G total capacity.
Distributed volume summary:
                  Total 25 distributed devices in consistency groups, 0 unhealthy.
                  Total 0 distributed devices not in consistency groups, 0
unhealthy
```

Display summary information when one or more devices are unhealthy:

```
VPlexcli:/> ds summary
Slot usage summary:
    Total 912 slots used by distributed device logging segments.
Distributed Volumes (not in Consistency Groups) Unhealthy Summary:
Device Name  Health State   Operational Status  Service Status
-----------  ------------   ------------------  ------------------
DR10         major-failure  stressed            cluster-unreachable
Distributed volumes (in consistency groups) unhealthy summary:
CG Name            Cache Mode    Number of      Cluster   Operational      Status
Details
----------------  ------------  Unhealthy     ---------  Status
-----------------------------------------
----------------  ------------  Vols          ---------  ----------------
-----------------------------------------
----------------  ------------  ------------- ---------  ----------------
-----------------------------------------
AA_ACW_Cluster12  synchronous   9              cluster-1  unknown          []
                                               cluster-2  suspended
```

```
[cluster-departure,

restore-link-or-choose-winner]
AP_ACW_Cluster1   synchronous   10              cluster-1  unknown           []
                                                cluster-2  suspended
[cluster-departure,

restore-link-or-choose-winner]
AP_ACW_Cluster2   synchronous   5               cluster-1  unknown           []
                                                cluster-2  suspended
[cluster-departure,

restore-link-or-choose-winner]
Distributed devices health summary:
                    Total 25 devices, 25 unhealthy.
Cluster summary:
                    Cluster cluster-2 : 25 distributed devices.
                    Cluster cluster-1 : 25 distributed devices.
Capacity summary:
                    0 devices have some free capacity.
                    0B free capacity of 500G total capacity.
Distributed volume summary:
                    Total 24 distributed devices in consistency groups, 24 unhealthy.
                    Total 1 distributed devices not in consistency groups, 1
unhealthy.
```

Use the --verbose argument to display detailed information about unhealthy volumes in each consistency group:

```
VPlexcli:/> ds summary --verbose
Slot usage summary:
    Total 912 slots used by distributed device logging segments.
Distributed Volumes (not in Consistency Groups) Unhealthy Summary:
Device Name  Health State   Operational Status  Service Status
-----------  ------------   -----------------   -------------------
DR10         major-failure  stressed            cluster-unreachable
Distributed volumes (in consistency groups) unhealthy summary:
CG Name            Cache Mode    Number of    Cluster   Operational     Status
Details
---------------  ------------  Unhealthy    ---------  Status
-----------------------------------------
---------------  ------------  Vols         ---------  ---------------
-----------------------------------------
---------------  -----------   -----------  ---------  ---------------
-----------------------------------------
AA_ACW_Cluster12  synchronous   9            cluster-1  unknown          []
                                             cluster-2  suspended        [cluster-
departure,
                                                                         restore-link-
or-choose-winner]
AP_ACW_Cluster1   synchronous   10           cluster-1  unknown          []
                                             cluster-2  suspended        [cluster-
departure,
                                                                         restore-link-
or-choose-winner]
AP_ACW_Cluster2   synchronous   5            cluster-1  unknown          []
                                             cluster-2  suspended        [cluster-
departure,
                                                                         restore-link-
or-choose-winner]
Distributed volumes (in consistency groups) unhealthy details:
CG Name            Unhealthy Vols
---------------
-------------------------------------------------------------------------------------
-----------
AA_ACW_Cluster12  ['DR11_vol', 'DR12_vol', 'DR13_vol', 'DR14_vol', 'DR15_vol',
'DR16_vol', 'DR17_vol', 'DR18_vol',
                  'DR19_vol']
AP_ACW_Cluster1   ['DR20_vol', 'DR21_vol', 'DR22_vol', 'DR23_vol', 'DR24_vol',
'DR25_vol', 'DR6_vol', 'DR7_vol',
                  'DR8_vol', 'DR9_vol']
AP_ACW_Cluster2   ['DRa_12_vol', 'DRb_12_vol', 'DRc_12_vol', 'DRd_12_vol', 'DRe_12_vol']
Distributed devices health summary:
                    Total 25 devices, 25 unhealthy.
```

```
Cluster summary:
                              Cluster cluster-2 : 25 distributed devices.
                              Cluster cluster-1 : 25 distributed devices.
Capacity summary:
                              0 devices have some free capacity.
                              0B free capacity of 500G total capacity.
Distributed volume summary:
                              Total 24 distributed devices in consistency groups, 24 unhealthy.
                              Total 1 distributed devices not in consistency groups, 1
unhealthy.
luster cluster-1 : 25 distributed devices.
.
```

See also

- export port summary
- export storage-view summary
- extent summary
- local-device summary
- storage-volume summary
- virtual-volume provision

exec

Executes an external program.

All contexts.

Syntax

`exec` *command*

Description

The program can be executed with zero or more arguments.

ⓘ **NOTE:** The correct syntax for program names and arguments depends on the host system.

Example

To display the date and time on Director-1-1-A:

```
VPlexcli:/> exec ssh 128.221.253.35 date
Tue Sep 21 14:32:52 UTC 2010
```

exit

Exits the shell.

Contexts

All contexts.

Syntax

```
exit
[-e|--exit-code] exit-code
[-s|--shutdown]
```

Arguments

Optional arguments	
`[-e|--exit-code]` *exit-code*	Returns the specified value when the shell exits. If no exit code is specified, then 0 is returned.
`[-s|--shutdown]`	When running in server mode, shuts down the shell instead of closing the socket. No effect if not running in server mode.

Description

If the shell is not embedded in another application, the shell process will stop.

Example

```
VPlexcli:/> exit
Connection closed by foreign host.
service@ManagementServer:~>
```

export initiator-port discovery

Discovers initiator ports on the front-end fabric.

Contexts

Cluster context and below.

In `/clusters/cluster/exports` context, command is `initiator-port discovery`.

In `/clusters/cluster/exports/initiator-ports` context, command is `discovery`.

Syntax

```
export initiator-port discovery
[-t|--timeout] seconds
```

```
[-w|--wait] seconds

[-c|--cluster] context-path]
```

Arguments

Optional arguments	
[-t|--timeout] seconds	The maximum number of seconds to wait for the front-end fabric discovery operation to complete. Default: 300. Range: 1- 3600.
[-w|--wait] seconds	The maximum number of seconds to wait for a response from the fabric discovery. Default: 10. Range: 1- 3600.
[-c|--cluster] context-path	Discover initiator ports on the specified cluster.

Description

Initiator discovery finds unregistered initiator-ports on the front-end fabric and determines the associations between the initiator ports and the target ports.

Use the `ll` command in `initiator-ports` context to display the same information for small configurations (where timeout does not occur)

Use the `export initiator-port discovery` command for large configurations in which `ls` command might encounter timeout limits.

Example

Discover initiator ports on another cluster:

```
VPlexcli:/clusters/cluster-1/exports/initiator-ports> discovery --cluster cluster-2
Name             port-wwn           node-wwn           type     Target Port Names
------------     ------------------ ------------------ -------  ------------------------
LicoJ013_hba1    0x10000000c97b1f3d 0x10000000c97b1f3d sun-vcs
LicoJ009_hba1    0x10000000c992c841 0x10000000c992c841 sun-vcs
LicoJ007_hba3    0x10000000c98a9dae 0x10000000c98a9dae sun-vcs
LicoJ011_hba2    0x10000000c992bf61 0x10000000c992bf61 sun-vcs
LicoJ010_hba1    0x10000000c992c84b 0x10000000c992c84b sun-vcs  P000000003CA000E6-A1-
FC00,
                                                                P000000003CA001CB-A1-
FC00,
                                                                P000000003CB000E6-B1-
FC00,
                                                                P000000003CB001CB-B1-FC00
.
.
.
```

```
VPlexcli:/> export initiator-port discovery --cluster cluster-1
Name                     iSCSI Name                                    type     Target
Port Names
----------------------   --------------------------------------------- -------
----------------------
dcca-esxprd19-iscsi-init iqn.1998-01.com.vmware:dcca-esxprd19-32a01812 default
P0000000046653D11-ETH06,

P0000000046653D11-ETH07,

P0000000046753D11-ETH06,

P0000000046753D11-ETH07,
```

```
P0000000046753D21-ETH06,

P0000000046753D21-ETH07
dcca-esxprd20-iscsi-init   iqn.1998-01.com.vmware:dcca-esxprd20-21d30945   default
P0000000046653D11-ETH06,

P0000000046653D11-ETH07,

P0000000046753D21-ETH06,

P0000000046753D21-ETH07
dcca-esxprd17-iscsi-init   iqn.1998-01.com.vmware:dcca-esxprd17-05ddcbad   default
P0000000046653D11-ETH06,

P0000000046653D11-ETH07,

P0000000046653D21-ETH06,

P0000000046653D21-ETH07,

P0000000046753D11-ETH06,

P0000000046753D11-ETH07,

P0000000046753D21-ETH06,

P0000000046753D21-ETH07
dcca-esxprd18-iscsi-init   iqn.1998-01.com.vmware:dcca-esxprd18-4af03225   default
P0000000046653D11-ETH06,

P0000000046653D11-ETH07,

P0000000046753D11-ETH06,

P0000000046753D11-ETH07,

P0000000046753D21-ETH06,

P0000000046753D21-ETH07
```

See also

- `export initiator-port register`

export initiator-port register

Registers an initiator-port, associating it with a SCSI address.

Contexts

All contexts.

In `/clusters/cluster/exports` context, command is `initiator-port register`.

In `/clusters/cluster/exports/initiator-ports` context, command is `register`.

Syntax

```
export initiator-port register
        [-c|--cluster] context-path
        [-t|--type] {type}
  [-i|--initiator-port]    initiator-port
```

```
        [-p|--port] port
```

Arguments

Required arguments	
`[-i|--initiator-port]` *initiator-port*	* Name to assign to the registered port. Name must be unique in the system. Command fails if the specified name is already in use.

`[-p|--port]` *port*	* Port identifier. For Fibre Channel initiators, a WWN pair as follows: *portWWN|nodeWWN*. *nodeWWN* is optional. Each WWN is either '0x' followed by one or more hex digits, or an abbreviation using the format: *string*:*number*[,*number*]. Following are four examples:
	
	`0xd1342a|0xd1342b`
	`hyy1:194e,4|hyy1:194e`
	`0xd1342a`
	`hyy1:194e,4`

Optional arguments	
`[-c|--cluster]` *context-path*	Cluster on which the initiator port is registered.
`[-t|--type]` *{type}*	Type of initiator port. If no type is specified, the default value is used. ● `hpux` - Hewlett Packard UX ● `sun-vcs` - Sun Solaris ● `aix` - IBM AIX ● `ibm-d910` - IBM Series D910 ● `default` - If no type is specified.

* - argument is positional.

Description

Use the `ll` command in `/clusters/cluster/directors/director/hardware /ports/port` context to display portWWNs and nodeWWNs.

Registers an initiator-port and associates it with a SCSI address. For Fibre Channel, the SCSI address is represented by a WWN pair.

See also

● `export initiator-port discovery`
● `export initiator-port unregister`
● `export target-port renamewwns`
● `set`

export initiator-port register-host

Creates a view, and registers each port WWN /name pair as an initiator port in that view.

Contexts

All contexts.

In `/clusters/cluster/exports` context, command is `initiator-port register-host`.

In `/clusters/cluster/exports/initiator-ports` context, command is `register-host.`

Syntax

```
export initiator-port register-host
```

`[-p|--ports]` *port,port…*

`[-f|--file]` *file*

`[-c|--cluster]` *cluster-context*

Arguments

Required arguments	
`[-f|--file]` *file*	* The host declaration file path name.
Optional arguments	
`[-c|--cluster]` *cluster-context*	* The cluster at which to create the view.
`[-p|--ports]` *port,port…*	List of port names. If omitted, all ports at the cluster will be used. Entries must be separated by commas.

* - argument is positional.

Description

Reads host port WWNs (with optional node WWNs) and names from a host declaration file. Creates a view, registering each port WWN /name pair as an initiator port in that view.

The host description file contains one line for each port on the host in the following format:

port WWN [|*node WWN*] *port-name*

Hosts must be registered in order to be exported (added to a storage view). Registering consists of naming the initiator and listing its ports WWN/GUID.

Each port of a server's HBA/HCA must be registered as a separate initiator.

See also

- `export initiator-port discovery`
- `export initiator-port unregister`

export initiator-port show-logins

Displays the initiator port logins to the metro node front-end target ports.

Context

All contexts.

Syntax

```
export initiator-port show-logins
```

`[-i|--initiator-ports]` *initiator-ports* [, *initiator-ports…*]

```
[-h|--help]
```

Arguments

Optional arguments	
`[-i|--initiator-ports]` *initiator-ports* [, *initiator-ports*...]	* Specifies the initiator-ports for which the login information is required.
`[-h|--help]`	Displays command line help.

* - argument is positional.

Description

Displays a list of target port logins for the specified initiator ports.

Example

Shows target port logins for all the initiator ports in metro node:

```
VPlexcli:/> export initiator-port show-logins *
Cluster Names    Initiator Port Names            Target Port Names
------------    ------------------------------   ------------------------
cluster-1       initiator_11                     P000000003CA0014C-A0-FC01
cluster-1       initiator_12                     P000000003CA0014C-A0-FC00
                                                 P000000003CB0014C-B0-FC00
cluster-2       initiator_21                     P000000003CA00150-A0-FC01
                                                 P000000003CB00150-B0-FC01
cluster-2       initiator_22                     P000000003CA00150-A0-FC00
                                                 P000000003CB00150-B0-FC00
```

Shows target port logins for initiator ports 11 and 22:

```
VPlexcli:/> export initiator-port show-logins -i initiator_11,initiator_22
Cluster Names    Initiator Port Names            Target Port Names
------------    ------------------------------   ------------------------
cluster-1       initiator_11                     P000000003CA0014C-A0-FC01
cluster-2       initiator_22                     P000000003CA00150-A0-FC00
                                                 P000000003CB00150-B0-FC00
```

Shows no target port logins for initiator port 22:

```
VPlexcli:/> export initiator-port show-logins initiator_22
Cluster Names    Initiator Port Names            Target Port Names
------------    ------------------------------   ------------------------
cluster-2       initiator_22                     None
```

See also

- `export initiator-port discovery`
- `export initiator-port register`
- `export initiator-port register-host`
- `export initiator-port unregister`

export initiator-port unregister

Unregisters the specified initiator-port(s).

Contexts

All contexts.

In `/clusters/cluster/exports` context, command is `initiator-port unregister`.

In `/clusters/cluster/exports/initiator-ports` context, command is `unregister`.

Syntax

```
export initiator-port unregister
i|--initiator-port] initiator-port [,initiator-port...]
[-f|--force]
[-
```

Arguments

Required arguments	
`[-i|--initiator-port]` *initiator-port* [, *initiator-port*...]	* One or more initiator ports to remove. Entries must be separated by commas.
Optional arguments	
`[-f|--force]`	Destroys the initiator-ports even if they are in use.

* - argument is positional.

Example

```
VPlexcli:> export initiator-port unregister -i win2k3_105_port1
```

See also

- `export initiator-port register`

export port summary

Displays a summary of exported ports for one or more clusters.

Contexts

All contexts.

In `/clusters/cluster/exports` context, command is `port summary`.

In `/clusters/cluster/exports/ports` context, command is `summary`.

Syntax

```
export port summary
[-c|--clusters] cluster [, cluster,...]
[-h|--help]
[--verbose]
```

Arguments

Optional arguments	
[-c|--clusters] cluster [, cluster,...]	Display unhealthy ports for only the specified cluster(s).
[-h|--help]	Displays command line help.
[--verbose]	Displays the names of the unhealthy volumes exported on each port.

Description

Prints a summary of the views and volumes exported on each port, and a detailed summary of the unhealthy ports.

In the `root` context, displays information for all clusters.

In `/cluster` context or below, displays information for only the current cluster.

Example

Show the summary of port health.

```
VPlexcli:/> export port summary
Port health summary(cluster-1):

port name               health state  enabled  views  virtual-volumes
----------------------  ------------  -------  -----  ---------------
P0000000046653D11-ETH06  healthy       true     1                   55
P0000000046653D11-ETH07  healthy       true     1                   55
P0000000046653D21-ETH06  healthy       true     1                   55
P0000000046653D21-ETH07  healthy       true     1                   55
P0000000046753D11-ETH06  healthy       true     1                   55
P0000000046753D11-ETH07  healthy       true     1                   55
P0000000046753D21-ETH06  healthy       true     1                   55
P0000000046753D21-ETH07  healthy       true     1                   55

        Total 8 ports, 0 unhealthy.

Port health summary(cluster-2):

port name               health state  enabled  views  virtual-volumes
----------------------  ------------  -------  -----  ---------------
P00000000A88A3112-ETH06  healthy       true     1                   55
P00000000A88A3112-ETH07  healthy       true     1                   55
P00000000A88A3122-ETH06  healthy       true     1                   55
P00000000A88A3122-ETH07  healthy       true     1                   55
P00000000A89A3112-ETH06  healthy       true     1                   55
P00000000A89A3112-ETH07  healthy       true     1                   55
P00000000A89A3122-ETH06  healthy       true     1                   55
P00000000A89A3122-ETH07  healthy       true     1                   55

        Total 8 ports, 0 unhealthy.
```

Display port health for a specified cluster:

```
VPlexcli:/> export port summary --clusters cluster-1
Port health summary(cluster-1):
port name                   export status  view summary
------------------------    -------------  ------------------
P000000003CA00147-A0-FC01   suspended      no unhealthy views
P000000003CA00147-A0-FC03   suspended      no unhealthy views
P000000003CA00147-A1-FC01   suspended      no unhealthy views
.
.
.
port name                   health state  enabled  views  virtual-volumes
------------------------    ------------  -------  -----  ---------------
P000000003CA00147-A0-FC00   healthy       true       1                  1
P000000003CA00147-A0-FC02   healthy       true       2                 28
P000000003CA00147-A1-FC00   healthy       true       1                  1
.
.
.
P000000003CB00147-B0-FC03   unhealthy     true       0                  0
P000000003CB00147-B1-FC01   unhealthy     true       0                  0
P000000003CB00147-B1-FC03   unhealthy     true       0                  0
        Total 16 ports, 8 unhealthy.
VPlexcli:/> export port summary -c cluster-1/
Port health summary(cluster-1):
port name                 export status  view summary
--------------------      -------------
--------------------------------------------------------------
P0000000037204D11-ETH06   pending        view name                unhealthy volumes
operational status
                                         -----------------------  -----------------
-----------------
                                         chimera_view2_C1         0
degraded
                                         chimera_view1_C1         0
degraded
                                         C1_H2                    0
degraded
                                         chimera_setupTearDown_C1 0
degraded
port name                 health state  enabled  views  virtual-volumes
-----------------------   ------------  -------  -----  ---------------
P0000000037204D11-ETH07   healthy       true       4                 30
P0000000037204D21-ETH06   healthy       true       4                 30
P0000000037204D21-ETH07   healthy       true       4                 30
P0000000037304D11-ETH06   healthy       true       4                 30
P0000000037304D11-ETH07   healthy       true       4                 30
P0000000037304D21-ETH06   healthy       true       4                 30
P0000000037304D21-ETH07   healthy       true       4                 30
P0000000037204D11-ETH06   unhealthy     false      4                 30
        Total 8 ports, 1 unhealthy.
```

Display port health using verbose argument:

```
VPlexcli:/clusters/cluster-1/exports/ports> summary --verbose
Port health summary(cluster-1):
port name                   export status  view summary
------------------------    -------------  ------------------
P000000003CA00147-A0-FC01   suspended      no unhealthy views
P000000003CA00147-A0-FC03   suspended      no unhealthy views
P000000003CA00147-A1-FC01   suspended      no unhealthy views
.
.
.
port name                   health state  enabled  view summary
------------------------    ------------  -------  ------------------------
P000000003CA00147-A0-FC00   healthy       true     view      virtual-volumes
                                                   --------  ---------------
                                                   LicoJ013                1
P000000003CA00147-A0-FC02   healthy       true     view      virtual-volumes
                                                   --------  ---------------
```

```
                                                    LicoJ013                      1
                                                    LicoJ009                     27
.
.
.
P000000003CB00147-B0-FC03   unhealthy      true      no views
P000000003CB00147-B1-FC01   unhealthy      true      no views
P000000003CB00147-B1-FC03   unhealthy      true      no views
        Total 16 ports, 8 unhealthy.
```

See also

- `ds summary`
- `export storage-view summary`
- `extent summary`
- `local-device summary`
- `storage-volume summary`
- `virtual-volume provision`

export storage-view addinitiatorport

Adds the specified initiator port(s) to a storage view.

Contexts

All contexts.

In /clusters/*cluster*/exports context, command is `storage-view addinitiatorport`.

In /clusters/*cluster*/exports/storage-views context, command is `addinitiatorport`.

Syntax

`export storage-view addinitiatorport`

`[-v|--view]` *context-path*

`[-i|--initiator-ports]` *initiator-ports* [, *initiator-ports*...]

Arguments

Required arguments	
`[-i|--initiator-ports]` *initiator-ports* [, *initiator-ports*...]	* List of one or more initiator ports to add to the view. Entries must be separated by commas.
Optional arguments	
`[-v|--view]` *context-path*	View to which to add the specified initiator port(s).

* - argument is positional.

Description

Select ports from two different directors so as to maximize redundancy.

Example

Add the initiator `iE_209_hba0` to the view named `Dell_209_view`:

```
VPlexcli:/clusters/cluster-1/exports> storage-view addinitiatorport --view Dell_209_view
--initiator-ports iE_209_hba0
```

See also

* `export storage-view create`
* `export storage-view removeinitiatorport`

export storage-view addport

Adds the specified port(s) to the storage view.

Contexts

All contexts.

In `clusters/`*cluster*`/exports/storage-views/storage-view` context, command is `addport`.

Syntax

```
export storage-view addport
[-v|--view] context-path
[-p|--ports] context-path,context-path...
```

Arguments

Required arguments	
`[-p|--ports]` *context-path,context-path ...*	* List of one or more ports to be added to the view. Entries must be separated by commas.
Optional arguments	
`[-v|--view]` *context-path*	Storage view to which to add the specified ports.

* - argument is positional.

Description

Use the `ll /clusters/`*cluster*`/exports/ports` command to display ports on the cluster.

Example

```
VPlexcli:/clusters/cluster-1/exports/storage-views/TestStorageView> export storage-view
addport --ports P000000003CB00147-B0-FC03
```

See also

- export storage-view create
- export storage-view removeport

export storage-view addvirtualvolume

Adds a virtual volume to a storage view.

Contexts

All contexts.

In `/clusters/`*cluster*`/exports` context, command is `storage-view addvirtualvolume`.

In `/clusters/`*cluster*`/exports/storage-views` context, command is `addvirtualvolume`.

Syntax

```
export storage-view addvirtualvolume
```

[-v|--view] *context-path*

[-o|--virtual-volumes] *virtual-volume*, *virtual-volume*...

[-f|--force]

Arguments

Required arguments	
`[-o|--virtual-volumes]` *virtual-volume,virtual-volume ...*	* List of one or more virtual volumes or LUN-virtual-volume pairs. Entries must be separated by commas. LUN-virtual-volume pairs must be enclosed in parentheses (). Virtual volumes and LUN-virtual-volume pairs can be typed on the same command line. When only virtual volumes are specified, the next available LUN is automatically assigned by metro node.
Optional arguments	
`[-v|--view]` *context-path*	View to add the specified virtual volumes to.
`[-f|--force]`	Force the virtual volumes to be added to the view even if they are already in use, if they are already assigned to another view, or if there are problems determining the view's state. Virtual volumes that already have a LUN in the view will be re-mapped to the newly-specified LUN.

* - argument is positional.

Description

Add the specified virtual volume to the specified storage view. Optionally, specify the LUN to assign to the virtual volume. Virtual volumes must be in a storage view in order to be accessible to hosts.

When virtual volumes are added using only volume names, the next available LUN number is automatically assigned.

Virtual-volumes and LUN-virtual-volume pairs can be specified in the same command line. For example:

```
r0_1_101_vol,(2,r0_1_102_vol),r0_1_103_vol
```

To modify the LUN assigned to a virtual volume, specify a virtual volume that is already added to the storage view and provide a new LUN.

ⓘ **NOTE:** You cannot add a virtual volume to a storage view if the initialization status of the virtual volume is `failed` or `in-progress`.

Example

Add a virtual volume `Symm1254_7BF_1_vol` to the storage view `E_209_view`:

```
VPlexcli:/clusters/cluster-1/exports> storage-view addvirtualvolume --view E_209_view --
virtual-volumes Symm1254_7BF_1_vol
```

Modify the LUN assigned to a virtual volume already added to a view:

- The `ll` command in storage view context displays the LUN (0) assigned to a storage volume.
- The `export storage-view addvirtualvolume` (*LUN,Virtual-volume*) `--force` command assigns a new LUN to the virtual volume.
- The `ll` command in storage view context displays the new LUN assigned to a storage volume:

```
VPlexcli:/clusters/cluster-1/exports/storage-views/TestStorageView> ll
Name                     Value
----------------------   ------------------------------------------------
controller-tag           -
initiators               []
operational-status       stopped
port-name-enabled-status [P000000003CA00147-A1-FC01,true,suspended,
                         P000000003CB00147-B0-FC01,true,suspended]
ports                    [P000000003CA00147-A1-FC01, P000000003CB00147-B0-FC01]
virtual-volumes
[(0,TestDisDevice_vol,VPD83T3:6000144000000010a0014760d64cb325,16G)]
VPlexcli:/clusters/cluster-1/exports/storage-views/TestStorageView> export storage-view
addvirtualvolume (5,TestDisDevice_vol) --force
WARNING: Volume 'TestDisDevice_vol' already has LUN 0 in this view; remapping to LUN 5.
VPlexcli:/clusters/cluster-1/exports/storage-views/TestStorageView> ll
Name                     Value
----------------------   ------------------------------------------------
controller-tag           -
initiators               []
operational-status       stopped
port-name-enabled-status [P000000003CA00147-A1-FC01,true,suspended,
                         P000000003CB00147-B0-FC01,true,suspended]
ports                    [P000000003CA00147-A1-FC01, P000000003CB00147-B0-FC01]
virtual-volumes
[(5,TestDisDevice_vol,VPD83T3:6000144000000010a0014760d64cb325,16G)]
```

Add a virtual volume to a view using the `--force` option from the root context:

```
VPlexcli:/> export storage-view addvirtualvolume --view /clusters/Saul1/exports/storage-
views/TestStorageView --virtual-volumes dr710_20_C1Win_0038_12_vol --force
Volume {1} is synchronous and on a non-local device. Applications using this volume
may experience per I/O inter-cluster latency. If the applications are sensitive to this
latency, they may experience data unavailability.  Do you wish to proceed ? (Yes/No)
```

See also

- `export storage-view checkconfig`
- `export storage-view create`
- `export storage-view removevirtualvolume`
- `virtual-volume create`

- `virtual-volume re-initialize`

export storage-view checkconfig

Checks the configuration of the views.

Contexts

All contexts.

In `/clusters/`*cluster*`/exports` context, command is `storage-view checkconfig`.

In `/clusters/`*cluster*`/exports/storage-views` context, command is `checkconfig.`

Syntax

`export storage-view checkconfig`

Description

Performs the following checks:

- Identifies any virtual volumes that are exported more than once.
- Identifies views that contain only a single port.
- Identifies views that are disabled.

Example

To check all view configurations for all clusters from the CLI, type:

```
VPlexcli:/> export storage-view checkconfig
Checking cluster cluster-1:
No errors found for cluster cluster-1.
Checking cluster cluster-2:
No errors found for cluster cluster-2.
Volume dd_13_vol is exported multiple times:
    view: LicoJ009, lun: 14
    view: LicoJ010, lun: 14
Volume dd_16_vol is exported multiple times:
    view: LicoJ009, lun: 17
    view: LicoJ010, lun: 17
Volume dd_12_vol is exported multiple times:
    view: LicoJ009, lun: 13
    view: LicoJ010, lun: 13
Volume dd_19_vol is exported multiple times:
    view: LicoJ009, lun: 20
    view: LicoJ010, lun: 20
.
.
.
```

See also

- `export storage-view create`
- `export storage-view find`
- `export storage-view map`
- `export storage-view show-powerpath-interfaces`

export storage-view create

Creates a view with the given ports.

Contexts

All contexts.

Syntax

```
export storage-view create
[-c|--cluster] context-path
[-n|--name] name
[-p|--ports] context-path,context-path...
```

Arguments

Required arguments	
[-n|--name] name	* Name of the new view. Must be unique throughout metro node.
[-p|--ports] context-path,context-path...	* List of one or more ports to add to the view.
Optional arguments	
[-c|--cluster] context-path	The cluster to create the view on.

* - argument is positional.

Description

A storage view is a logical grouping of front-end ports, registered initiators (hosts), and virtual volumes used to map and mask LUNs. Storage views are used to control host access to storage.

For hosts to access virtual volumes, the volumes must be in a storage view. A storage view consists of:

- One or more initiators. Initiators are added to a storage view using the `export storage-view addinitiatorport` command.
- One or more virtual volumes. Virtual volumes are added to a storage view using the `export storage-view addvirtualvolume` command.
- One or more front-end ports. Ports are added to a storage view using the `export storage-view addport` command.

  ⚠ **CAUTION: The name assigned to the storage view must be unique throughout the metro node. In metro node Metro configurations, the same name must not be assigned to a storage view on the peer cluster.**

  Use the `ll clusters/*/exports/storage-views` command to display the names of existing storage views before assigning a name.

Example

Create a view named E_209_view for front-end ports A0 and B0:

```
VPlexcli:/clusters/cluster-1/exports/storage-views> storage-view create --cluster /
clusters/cluster-1 --name E_209_View --ports P000000601610428F-A0-FC00,P000000601610672E-
B0-FC00
```

```
VPlexcli:/clusters/cluster-1/exports/storage-views> storage-view create -c cluster-1/ -n
test -p P0000000046653D11-ETH06/ P0000000046653D11-ETH07/
```

See also

- export storage-view addport
- export storage-view addinitiatorport
- export storage-view addvirtualvolume
- export storage-view destroy

export storage-view destroy

Destroys the specified storage view.

Contexts

All contexts.

Syntax

```
export storage-view destroy
[-v|--view] context-path
[-f|--force]
```

Arguments

Required arguments	
[-v|--view] context-path ...	* Storage view to destroy.
Optional arguments	
[-f|--force]	Force the storage view to be destroyed even if it is in use.

* - argument is positional.

Description

Destroys the specified storage view.

Example

```
VPlexcli:/> export storage-view destroy /clusters/cluster-1/exports/storage-views/
TestStorageView
```

See also

- export storage-view create
- export storage-view removeinitiatorport
- export storage-view removeport
- export storage-view removevirtualvolume

export storage-view find

Displays export views for a specified volume, LUN, initiator, or cluster. Displays next available LUN number for all storage views.

Contexts

Cluster/exports and below.

In /clusters/*cluster*/exports context, command is storage-view find.

In /clusters/*cluster*/exports/storage-views context, command is find.

Syntax

export storage-view find

[-c|--cluster] *cluster*

[-v|--volume] *volume*

[-l|--lun] *LUN*

[-i|--initiator] *initiator*

[-f|--free-lun]

Arguments

Optional arguments	
[-c|--cluster] *cluster*	Cluster to search for views.
[-v|--volume] *volume*	Find the views exporting the specified volume. Identify the volume by name, VPD83 identifier, or a name pattern with wildcards.
[-l|--lun] *LUN*	Find the views exporting the specified LUN number.
[-i|--initiator-port] *initiator*	Find the views including the specified initiator. May contain wildcards.
[-f|--free-lun] -	Find the next free LUN number for all views.

Description

This command is most useful for configurations with thousands of LUNs, and a large number of views and exported virtual volumes.

Example

Find the next available LUN numbers on cluster 1:

```
VPlexcli:/clusters/cluster-1/exports/storage-views> find --cluster cluster-1 --free-lun
View LicoJ009 : next free LUN number is 27.
View LicoJ013 : next free LUN number is 1.
```

Find the views exporting the specified volume:

```
VPlexcli:/clusters/cluster-1/exports> export storage-view find --volume dd_03_vol
Views exporting volume dd_03_vol:
        View LicoJ009 exports
(4,dd_03_vol,VPD83T3:6000144000000010a0014760d64cb225,128G).
```

Find the views exported by initiators whose name starts with "Lico":

```
VPlexcli:/clusters/cluster-1/exports> export storage-view find --initiator Lico*
Views including inititator Lico*:
View LicoJ009.
View LicoJ013.
```

See also

- `export initiator-port discovery`
- `export storage-view find-unmapped-volumes`
- `export storage-view map`
- `export storage-view summary`

export storage-view find-unmapped-volumes

Displays unexported virtual volumes.

Contexts

All contexts.

Syntax

```
export storage-view find-unmapped-volumes
[-c|--cluster] cluster
```

Arguments

Required arguments	
`[-c|--cluster]` *cluster*	Cluster for which to display unexported storage volumes.

Description

Displays unexported virtual volumes in the specified cluster.

Displays the remote (on the other cluster) virtual volumes which are unexported.

See also

- `export storage-view addvirtualvolume`
- `export-storage-view removevirtualvolume`

export storage-view map

Displays all the virtual volumes that are exported to the storage view.

Contexts

All contexts.

In `/clusters/`*cluster*`/exports` context, command is `storage-view map`.

In `/clusters/`*cluster*`/exports/storage-views` context, command is `map`.

Syntax

`export storage-view map`

`[-v|--views]` *view*,*view*...

`[-f|--file]` *filename*

Arguments

Required arguments	
`[-v|--views]` *view*,*view*...	* List of one or more storage views to map. Entries must be separated by commas. May contain wildcards.
Optional arguments	
`[-f|--file]` *file*	Name of the file to send the output to. If no file is specified, output is to the console screen.

* argument is positional.

Example

Display unhealthy storage volumes for a specified storage view:

```
VPlexcli:/> export storage-view map LicoJ013
VPD83T3:6000144000000010a0014760d64cb32c dev_sym1723_1FC_vol
```

Display unhealthy storage volumes for all storage views:

```
VPlexcli:/> export storage-view map --views **
VPD83T3:6000144000000010a0014760d64ca44c base0_vol
VPD83T3:6000144000000010a0014760d64cb21f dd_00_vol
```

```
          .
          .
          .
```

Display unhealthy storage volumes for all the views at cluster-2:

```
VPlexcli:/> export storage-view map  /clusters/cluster-2/exports/storage-views/*
VPD83T3:6000144000000010a000e68dc5f76188 base01_vol
VPD83T3:6000144000000010a0014760d64cb21f dd_00_vol
VPD83T3:6000144000000010a0014760d64cb221 dd_01_vol
          .
          .
          .
```

See also

- `export storage-view find-unmapped-volumes`
- `export storage-view find`
- `export storage-view summary`

export storage-view removeinitiatorport

Removes the specified initiator-port(s) from the view.

Contexts

All contexts.

In `/clusters/cluster/exports` context, command is `storage-view removeinitiatorport`.

In `/clusters/cluster/exports/storage-views` context, command is `removeinitiatorport`.

Syntax

`export storage-view removeinitiatorport`

`[-v|--view]` *context-path*

`[-i|--initiator-ports]` *context-path,context-path...*

Arguments

Required arguments	
`[-i|--initiator-ports]` *context-path,context-path...*	* Comma- separated list of one or more initiator ports to remove.
Optional arguments	
`[-v|--view]` *context-path*	The storage view from which to remove the initiator port.

* - argument is positional.

Description

Use the `ll /clusters/`*cluster*`/exports/storage-views/storage-view` command to display the initiator ports in the specified storage view.

Example

Remove an initiator port from `/clusters/`*cluster*`/exports/storage-views/storage-view` context:

```
VPlexcli:/clusters/cluster-1/exports/storage-views /LicoJ009> removeinitiatorport  -i
LicoJ009_hba1
```

See also

- `export storage-view addinitiatorport`
- `export storage-view removeport`

export storage-view removeport

Removes the specified port(s) from a storage view.

Contexts

All contexts.

In `/clusters/`*cluster*`/exports/storage-views/storage-view` context, command is `removeport`..

Syntax

`export storage-view removeport`

`[-v|--view]` *context-path*

`[-p|--ports]` *context-path,context-path...*

Arguments

Required arguments	
`[-p|--ports]` *context-path,context-path ...*	* List of one or more ports to be removed from the view. Entries must be separated by commas.
Optional arguments	
`[-v|--view]` *context-path*	View from which to remove the specified ports.

* - argument is positional.

Description

Use the `ll /clusters/`*cluster*`/exports/storage-views/storage-view` command to display the ports in the specified storage view

Example

Remove a port from `/clusters/`*`cluster`*`/exports/storage-views/storage-view` context:

```
VPlexcli:/clusters/cluster-1/exports/storage-views/LicoJ009> removeport -p
P000000003CA00147-A0-FC02
```

See also

- `export storage-view addport`
- `export storage-view destroy`

export storage-view removevirtualvolume

Removes the specified virtual volume from the view.

Contexts

All contexts.

In `/clusters/`*`cluster`*`/exports` context, command is `storage-view removevirtualvolume`.

In `/clusters/`*`cluster`*`/exports/storage-views` context, command is `removevirtualvolume.`

Syntax

`export storage-view removevirtualvolume`

`[-v|--view]` *`context-path`*

`[o|--virtual-volumes]` *`volume,volume...`*

`[-f|--force]`

Arguments

Required arguments	
`[-o|--virtual-volumes]` *`volume,volume`* `...`	* List of one or more virtual volumes to be removed from the view. Entries must be separated by commas.
Optional arguments	
`[-f|--force]`	Force the virtual volumes to be removed from the view even if the specified LUNs are in use, the view is live, or some of the virtual volumes do not exist in the view.
`[-v|--view]` *`context-path`*	View from which to remove the specified virtual volumes.

* - argument is positional.

Description

Use the `ll /clusters/`*`cluster`*`/exports/storage-views/storage-view` command to display the virtual volumes in the specified storage view

Example

Delete a virtual volume from the specified storage view, even though the storage view is active:

```
VPlexcli:/clusters/cluster-1/exports/storage-views> removevirtualvolume --view E209_View
--virtual-volume (1,test3211_r0_vol) --force
WARNING: The storage-view 'E209_View' is a live storage-view and is exporting storage
through the following initiator ports:
'iE209_hba1_b', 'iE209_hba0'. Performing this operation may affect hosts' storage-view
of storage. Proceeding anyway.
```

See also

- `export storage-view addvirtualvolume`
- `export storage-view destroy`

export storage-view show-powerpath-interfaces

Displays the mapping between PowerPath® interfaces and the metro node system ports.

Contexts

`clusters/cluster` context and below.

Syntax

```
export storage-view show-powerpath-interfaces
    [-c|--cluster] context-path
```

Arguments

Optional arguments	
`[-c|--cluster]` *context-path*	The cluster at which to show the PowerPath interface mapping.

See also

- `export storage-view checkconfig`
- `export storage-view find`
- `export storage-view map`
- `export storage-view summary`

export storage-view summary

Lists each view and the number of virtual volumes and initiators that it contains.

Contexts

All contexts.

In `/clusters/cluster/exports/storage-views` context, command is `summary`.

Syntax

```
export storage-view summary
[-c|--clusters] cluster,cluster...
```

Arguments

Optional arguments	
`[-c|--cluster]` **cluster**, *cluster*...	List of clusters. Entries must be separated by commas. Display information only for storage views on the specified clusters.

Description

At the root level, displays information for all clusters.

At the `/clusters/cluster` context and below, displays information only for views in the cluster in that context.

Example

Display storage view summary for a specified cluster (no unhealthy views):

```
VPlexcli:/> export storage-view summary --clusters cluster-1
View health summary(cluster-1):
view name   health-state  exported volumes   ports  registered initiators
---------   ------------  ----------------   -----  ---------------------
LicoJ009    healthy                     27   4                          4
LicoJ013    healthy                      1   8                          4
        Total 2 views, 0 unhealthy.
```

Display storage view summary for all clusters (1 unhealthy view):

```
VPlexcli:/> export storage-view summary
View health summary(cluster-1):
view name    health-state  exported volumes   ports  registered initiators
---------    ------------  ----------------   -----  ---------------------
poly2_view   healthy                      5   4                          2
view1        healthy                      1   4                          1
        Total 2 views, 0 unhealthy.
View health summary(cluster-2):
view name   operational status   port summary
---------   ------------------   ------------------------------------------------
esx1_view   error                port name                      unhealthy volumes  export
status
---------------------   ----------------   -------------
                        P000000003B2017D8-A0-FC00                     1  ok
                        P000000003B2017D8-A0-FC01                     1  ok
                        P000000003B3017D8-B0-FC00                     1  ok
                        P000000003B3017D8-B0-FC01                     1  ok
view name   health-state  exported volumes   port s  registered initiators
---------   ------------  ----------------   -----  ---------------------
esx1_view   unhealthy                   10   4                          2
        Total 1 views, 1 unhealthy.
```

See also

* `export port summary`

- `export storage-view checkconfig`
- `export storage-view map`
- `export storage-view show-powerpath-interfaces`
- `storage-volume summary`

export target-port renamewwns

Renames a target port's WWN pair.

Contexts

All contexts.

In `/clusters/cluster/exports` context, command is `target-port renamewwns`.

Syntax

`export target-port renamewwns`

`[-p|--port]` *context-path*

`[-w|--wwns]` *wwns*

Arguments

Required arguments	
`[-w|--wwns]` *wwns*	A WWN pair separated by "|":
	portWWN|*nodeWWN*
	Each WWN is either '0x' followed by one or more hexadecimal digits or an abbreviation, in the following format:
	string:*number*[,*number*]
	For example,
	0xd1342a|0xd1342b
	hyy1:194e,4|hyy1:194e
	0xd1342a
	hyy1:194e,4
Optional arguments	
`[-p|--port]` *context-path*	- Target port for which to rename the WWN pair.

Description

Use the ll command in /clusters/cluster/export/port context to display portWWNs and nodeWWNs.

⚠ **CAUTION: Disable the corresponding Fibre Channel port before executing this command.**

Example

```
VPlexcli:/> export target-port renamewwns --wwns 0xd1342a|0xd1342b --port
P0000000000000001-FK00
```

See also

- `export initiator-port discovery`

extent create

Creates one or more storage-volume extents.

Contexts

All contexts.

Syntax

```
extent create
[-s|--size] size

[-o|--block-offset] integer
[-n|--num-extents] integer
[-d|--storage-volumes] storage-volume,storage-volume...
```

Arguments

Required arguments	
[-d|--storage-volumes] *storage-volume,storage-volume* ...	* Names of one or more claimed storage volumes to extent. Entries must be separated by commas.

* - argument is positional.

Description

An extent is a slice (range of 4K byte blocks) of a storage volume. An extent is only allowed to use the entire capacity of the storage volume.

Extents are the building blocks for devices.

This command can fail if there is not a sufficient number of meta volume slots. See the troubleshooting section of the metro node procedures in the SolVe Desktop for a resolution to this problem.

Examples

In the following example:

- The `ll -p **/storage-volumes` command displays a list of all storage volumes.

- The `cd` command changes the context to the storage-volume context on cluster-1.
- The `extent create` command creates an extent from two claimed 16 GB storage volumes.

```
VPlexcli:/> ll -p **/storage-volumes
```

```
Name                       VPD83 ID                                       Capacity  Use        Vendor  IO      Type         Thin
                                                                                                         Status               Rebuild
-------------------------  ---------------------------------------------  --------  ---------  ------  ------  -----------  -------
Basic_c1_ramdisk_100GB_684_  VPD83T3:60001440000000103017dfea88355431    100G      claimed    EMC     alive   normal       false
Basic_c1_ramdisk_100GB_685_  VPD83T3:60001440000000103017dfea88355433    100G      claimed    EMC     alive   normal       false
Basic_c1_ramdisk_100GB_686_  VPD83T3:60001440000000103017dfea88355435    100G      claimed    EMC     alive   normal       false
Basic_c1_ramdisk_100GB_687_  VPD83T3:60001440000000103017dfea88355437    100G      claimed    EMC     alive   normal       false
Basic_c1_ramdisk_100GB_688_  VPD83T3:60001440000000103017dfea88355439    100G      claimed    EMC     alive   normal       false
Basic_c1_ramdisk_100GB_689_  VPD83T3:60001440000000103017dfea8835543b    100G      claimed    EMC     alive   normal       false
Basic_c1_ramdisk_100GB_68_   VPD83T3:60001440000000103017dfea88354f61    100G      claimed    EMC     alive   normal       false
Basic_c1_ramdisk_100GB_690_  VPD83T3:60001440000000103017dfea8835543d    100G      claimed    EMC     alive   normal       false
Basic_c1_ramdisk_100GB_691_  VPD83T3:60001440000000103017dfea8835543f    100G      claimed    EMC     alive   normal       false
Basic_c1_ramdisk_100GB_692_  VPD83T3:60001440000000103017dfea88355441    100G      claimed    EMC     alive   normal       false
```

```
VPlexcli:/>cd /clusters/cluster-1/storage-elements/storage-volumes
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> extent create
Symm1723_1DC,Symm1723_1E0
```

See also

- `extent create`
- `extent destroy`

extent destroy

Destroys one or more storage-volume extents.

Contexts

All contexts.

Syntax

```
extent destroy
[-f|--force]
[-s|--extents] context-path,context-path...
```

Arguments

Required arguments	
`[-s|--extents]` context-path,context-path ...	* List of one or more extents to destroy. Entries must be separated by commas.
Optional arguments	
`[-f|--force]`	Forces the destruction of the given extents, bypassing all guards and confirmations.

* - argument is positional.

Description

Destroys the specified extents.

Example

Destroy an extent:

```
VPlexcli:/clusters/cluster-1/storage-elements/extent> extent destroy --force
extent_Symm1254_7BA_1
Destroyed 1 out of 1 targeted extents.
```

See also

- `extent create`

extent summary

Displays a list of a cluster's unhealthy extents.

Contexts

All contexts.

In `/clusters/cluster/storage-elements/extents` context, command is `summary`.

Syntax

```
extent summary
[-c|--clusters] cluster,cluster...
```

Arguments

Optional arguments	
`[-c|--clusters]` *cluster,cluster...*	List of clusters to summarize, separated by commas. May contain glob characters.

Description

Displays a cluster's unhealthy extents (if any exist), the total number of extents by use, and calculates the total extent capacity for this cluster.

An unhealthy extent has a non-nominal health state, operational status or I/O status.

If the `--clusters` argument is not specified and the command is executed at or below a specific cluster's context, information is summarized for only that cluster. Otherwise, the extents of all clusters are summarized.

Table 9. extent summary field descriptions

Field	Description
`Health summary` (displayed only for unhealthy extents)	
`Name`	Name of extent.

Table 9. extent summary field descriptions (continued)

Field	Description
I/O Status	`alive` - I/O is proceeding normally on the extent.
	`dead` - The underlying storage volume is marked as hardware-dead.
	`unreachable` - The underlying storage volume is unreachable.
Operational Status	`degraded` - The extent may be out-of-date compared to its mirror (applies only to extents that are part of a RAID 1 device).
	`ok` - The extent is functioning normally.
	`starting` - The extent is not yet ready.
	`unknown` - Metro node cannot determine the extent's Operational state, or the state is invalid.
Health State	`degraded` - The extent may be out-of-date compared to its mirror (applies only to extents that are part of a RAID 1 device).
	`ok` - The extent is functioning normally.
	`non-recoverable-error` - The extent may be out-of-date compared to its mirror (applies only to extents that are part of a RAID 1 device), and/or the Health state cannot be determined.
	`unknown` - Metro node cannot determine the extent's Operational state, or the state is invalid.
Extent Summary	
Health	`extents` - Total number of extents on the cluster, the number.
	`out-of-date` - Of the total number of extents on the cluster, the number that are out-of-date compared to their mirror.
	`unhealthy` - Of the total number of extents on the cluster, the number with operational status or health state that is not "`ok`".
Use	used - Of the total number of extents on the cluster, the number in use.
	`claimed` - Of the total number of extents on the cluster, the number that are claimed
	`unclaimed` - Of the total number of extents on the cluster, the number that are unclaimed.
	`unusable` - Indicates that the underlying storage-volume of the extent is dead or unreachable. Use the storage-volume summary command to check the storage-volume. Use the validate-system-configuration command to check reachability from the directors.
	logging - Of the total number of extents on the cluster, the number that are in use for logging.
Capacity	Total capacity on the cluster.

See also

- `ds summary`
- `export port summary`
- `export storage-view summary`
- `local-device summary`
- `storage-volume summary`
- `virtual-volume provision`

find

Finds all the contexts matching a pattern and returns a set contexts matching supplied pattern.

Contexts

All contexts.

Syntax

```
find
[-c | --contexts] = pattern [, pattern ...]
[-h | --help]
[--verbose]
```

Arguments

Required arguments	
`[-c	--contexts]` = *pattern [, pattern ...]*	Pattern for matching contexts you want to find.
Optional arguments	
`[-h	--help]`	Displays the usage for this command
`[--verbose]`	Provides additional output during command execution. This may not have any effect for some commands.

Description

Use this command to find all contexts matching a pattern. When invoked interactively, the command prints the contexts to the screen.

See Searching the context tree for more information about the find command and related examples.

front-end-performance-stats start

Starts the collection of the read and write statistics with the I/O size and the logical block addressing (LBA) information on the metro node virtual volumes through periodic polling.

Contexts

All contexts.

Syntax

```
front-end-performance-stats start
```

Arguments

Optional arguments	
`-h	--help`	Displays the usage for this command.
`--verbose`	Provides more output during command execution. This might not have any effect for some commands.

Description

Starts the collection of the read and write statistics with the I/O size and the logical block addressing (LBA) information on the metro node virtual volumes through periodic polling. This command starts generating the performance data, which helps resolve I/O performance issues with metro node. The statistics are available in the `fe_perf_stats_<timestamp>.log` file at `/var/log/VPlex/cli/`.

ⓘ **NOTE:** Run this command on each cluster to collect the front-end performance statistics. After you run this command, the system continues to collect the front-end performance statistics until you run the `front-end-performance-stats stop` command.

See also

● `front-end-performance-stats stop`
● `front-end-performance-stats status`

front-end-performance-stats status

Displays the status of front-end performance statistics collection.

Contexts

All contexts.

Syntax

```
front-end-performance-stats status
```

Arguments

Optional arguments	
`-h	--help`	Displays the usage for this command.
`--verbose`	Provides more output during command execution. This might not have any effect for some commands.

Description

Provides the status of the front-end performance statistics collection. The details include the name of the log file that contains the statistics, the period for which the statistics collection has been running, the time when the directors were polled for information for the last time, and the number of errors that occurred per director in the last two hours.

ⓘ **NOTE:** Run this command on each cluster to view the status of the front-end performance statistics collection.

See also

- `front-end-performance-stats start`
- `front-end-performance-stats stop`

front-end-performance-stats stop

Stops the front-end performance statistics collection.

Contexts

All contexts.

Syntax

```
front-end-performance-stats stop
```

Arguments

Optional arguments	
`-h	--help`	Displays the usage for this command.
`--verbose`	Provides more output during command execution. This might not have any effect for some commands.

Description

Stops the front-end performance statistics collection. The statistics are available in the `fe_perf_stats_<timestamp>.log` file at `/var/log/VPlex/cli/`.

ⓘ **NOTE:** Run this command on each cluster to stop the front-end performance statistics collection.

See also

- `front-end-performance-stats start`
- `front-end-performance-stats status`

getsysinfo

Returns information about the current system.

Contexts

All contexts.

Syntax

```
getsysinfo
--output path-name
-linux
```

Arguments

Optional arguments	
`--output` *path-name*	Location and name of the output file. Default: `/var/log/VPlex/cli/YY-sysinfo.txt`
`--linux`	Use this if the management server is running on a Linux system. Disables the scsi tests since Linux systems lack a scsi command.

Description

Display information and send the output to a file.

The information is written in TCL format.

Table 10. getsysinfo field descriptions

Field	Description
Flag includeDebug	Ignore this line.
Flag isLinux = 0	Denotes a linux simulator build. Ignore this line.
Treating this tower like version D4	Denotes the system is Release 4.0 or later. Ignore this line.
nn ports - unknown system type	The getsysinfo script looked for hardware prior to Release 4.0 and did not find it.

Table 10. getsysinfo field descriptions (continued)

Field	Description
System does NOT have comtcp enabled	Communication protocol used on Ethernet ports for connections to other clusters prior to Release 4.0. Ignore this line.

Example

Display information and send the output to a file:

```
VPlexcli:/> getsysinfo --output /var/log/VPlex/cli/TestGetSysInfo
Running from localhost:/var/log/VPlex/cli
Local time 2010/08/04 14:22:43
Flag includeDebug = 0
Flag isLinux = 0
Treating this tower like version D4
clustercount = 2
26 ports - unknown system type
System does NOT have comtcp enabled
## ===== NCB: Cluster_1_Dir1A  ====================
## ===== NCB: Cluster_1_Dir1B  ====================
.
.
.
Raw    output saved to /var/log/VPlex/cli/TestGetSysInfo.2010-08-04-14.25.raw
```

See also

- `cluster summary`
- `director firmware show-banks`
- `manifest version`
- `version`

health-check

Displays a report indicating overall hardware/software health.

Contexts

All contexts.

Syntax

```
health-check
[-m|--highlevel]
[-f|--full]
--configuration
--back-end
--front-end
--limits
--cache
--consistency-group
```

```
--wan

--hardware

--cluster_witness

--virtual-ha
```

Arguments

Optional arguments	
[-m|--highlevel]	Checks for major subcomponents with error conditions. Warnings are ignored. Used for instantaneous, high level view of the health of the metro node. Default behavior if no other argument is specified.
[-f|--full]	Runs full scan.
--configuration	Perform configuration checks.
--back-end	Perform back end checks.
--front-end	Perform front end checks.
--cache	Perform cache check.
--limits	Lists the configuration limits for the configuration.
--consistency-group	Perform consistency group check.
--wan	Perform WAN health checks.
--cluster_witness	Perform cluster witness related checks.
--hardware	Perform hardware checks.
--virtual-ha	Perform validation of metro node high availability related checks.

Description

High level view of the health of the metro node.

Consolidates information from the following commands:

- `version`
- `cluster status`
- `cluster summary`
- `connectivity validate-be`
- `connectivity validate-wan-com`
- `ds summary`
- `export storage-view summary`
- `virtual-volume summary`
- `storage-volume summary`
- `ll /clusters/**/system-volumes/`

Example

Run a high-level (default) health check on a metro node Metro:

```
VPlexcli:/> health-check
Product Version: 5.1.0.00.00.10
Clusters:
---------
```

```
Cluster     Cluster  Oper    Health    Connected   Expelled
Name        ID       State   State
---------   -------  -----   --------  ---------   --------
cluster-1   1        ok      degraded  True        False
cluster-2   2        ok      ok        True        False
cluster-1 Transition/Health Indications:
  Device initializing
  20 unhealthy Devices or storage-volumes
Meta Data:
----------
Cluster     Volume                          Volume          Oper    Health  Active
Name        Name                            Type            State   State
---------   -----------------------------   -------------   -----   ------  ------
cluster-1   Advil_1                         meta-volume     ok      ok      True
cluster-1   logging_c1_log_vol              logging-volume  ok      ok      -
cluster-1   Advil_1_backup_2012Mar07_043012 meta-volume     ok      ok      False
cluster-1   Advil_1_backup_2012Mar08_043011 meta-volume     ok      ok      False
cluster-2   logging_c2_log_vol              logging-volume  ok      ok      -
cluster-2   Advil-2_backup_2012Mar08_043020 meta-volume     ok      ok      False
cluster-2   Advil-2_backup_2012Mar07_043017 meta-volume     ok      ok      False
cluster-2   Advil-2                         meta-volume     ok      ok      True
Front End:
----------
Cluster     Total    Unhealthy  Total       Total   Total     Total
Name        Storage  Storage    Registered  Ports   Exported  ITLs
            Views    Views      Initiators          Volumes
---------   -------  ---------  ----------  -----   --------  -----
cluster-1   4        2          12          8       135       672
cluster-2   0        0          0           0       0         0
Storage:
--------
Cluster     Total    Unhealthy  Total     Unhealthy  Total   Unhealthy  No      Not visible
Name        Storage  Storage    Virtual   Virtual    Dist    Dist       Dual    from
            Volumes  Volumes    Volumes   Volumes    Devs    Devs       Paths   All Dirs
---------   -------  ---------  -------   ---------  -----   ---------  -----   -----------
cluster-1   2375     10         229       10         12      0          0       0
cluster-2   2365     0          205       0          12      0          0       0
Consistency Groups:
-------------------
Cluster     Total        Unhealthy    Total         Unhealthy
Name        Synchronous  Synchronous  Asynchronous  Asynchronous
            Groups       Groups       Groups        Groups
---------   -----------  -----------  ------------  ------------
cluster-1   9            0            0             0
cluster-2   5            0            0             0
FC WAN Connectivity:
--------------------
Port Group     Connectivity
------------   ------------
port-group-1   ok
port-group-0   ok
Cluster Witness:
----------------
Cluster Witness is not configured
```

Run a full-scan health-check on a metro node Metro:

```
VPlexcli:/> health-check --full
Configuration (CONF):
Checking VPlexCli connectivity to directors.................... OK
Checking Directors Commission.................................. OK
Checking Directors Communication Status........................ OK
Checking Directors Operation Status............................ OK
Checking ports status.......................................... Error
Checking Call Home............................................. Warning
Checking Connectivity.......................................... OK
Checking COM Port Power Level.................................. OK
Checking Meta Data Backup...................................... Warning
Checking Meta Data Slot Usage.................................. Error
Back End (BE):
Checking Unreachable Storage Volumes........................... OK
Checking Degraded Storage Volumes..............................Error
Checking Unhealthy Virtual Volumes............................. OK
```

```
Back end array status.................................................. OK
Validating paths to back end arrays.............................. OK
Front End (FE):
Checking Storage Views........................................... OK
Checking Front End Path........................................... OK
Cache:
Checking for sub-pages writes(25% or above of total writes).... OK
Checking Stuck IO................................................ OK
Consistency Group Health:
Consistency Group Health......................................... OK
WAN Link:
WAN Configuration................................................ OK
WAN Port Settings................................................ OK
WAN Port Group Settings.......................................... OK
WAN Subnet Settings.............................................. OK
WAN Bridged and Routed Settings.................................. OK
WAN Ping Remote IPs.............................................. OK
Director Health Status:
Checking SSD Hardware............................................ OK
Checking Director RPMs........................................... OK
Output to /var/log/VPlex/cli/health_check_full_scan.log
```

Run 2 WAN-only scans:

- The first in (default) high-level mode,
- The second in verbose mode:

```
VPlexcli:/> health-check --wan
WAN Link:
WAN Configuration.... OK
VPlexcli:/> health-check --wan --verbose
WAN Link:
WAN Configuration................. OK
Connectivity: full
    All port-groups have a status of either ok or warning. com connectivity is
    complete through minor configuration errors may still exist (see individual
    port-group statuses).
port-group-1: OK
    All com links have the expected connectivity: this port-group is operating
    correctly.
port-group-0: OK
    All com links have the expected connectivity: this port-group is operating
    correctly.
WAN Port Settings.................. OK
WAN Port Group Settings............ OK
WAN Subnet Settings................ OK
WAN Bridged and Routed Settings.... OK
WAN Ping Remote IPs................ OK
    ping from director-1-1-A:
        Remote Discovery IP:
            224.100.100.100 is reachable, Round-trip time:0.328 ms
        Remote Cluster IPs:
            192.168.4.252 is reachable, Round-trip time:0.083 ms
            192.168.5.252 is reachable, Round-trip time:0.081 ms
    ping from director-1-1-B:
        Remote Discovery IP:
            224.100.100.100 is reachable, Round-trip time:0.431 ms
        Remote Cluster IPs:
            192.168.4.252 is reachable, Round-trip time:0.086 ms
            192.168.5.252 is reachable, Round-trip time:0.083 ms
    ping from director-1-2-A:
        Remote Discovery IP:
            224.100.100.100 is reachable, Round-trip time:0.297 ms
        Remote Cluster IPs:
            192.168.4.252 is reachable, Round-trip time:0.088 ms
            192.168.5.252 is reachable, Round-trip time:0.103 ms
    ping from director-1-2-B:
        Remote Discovery IP:
            224.100.100.100 is reachable, Round-trip time:0.311 ms
        Remote Cluster IPs:
            192.168.4.252 is reachable, Round-trip time:0.089 ms
            192.168.5.252 is reachable, Round-trip time:0.075 ms
    ping from director-2-1-A:
```

```
              Remote Discovery IP:
                  224.100.100.100 is reachable, Round-trip time:0.371 ms
              Remote Cluster IPs:
                  192.168.4.251 is reachable, Round-trip time:0.08 ms
                  192.168.5.251 is reachable, Round-trip time:0.091 ms
        ping from director-2-1-B:
              Remote Discovery IP:
                  224.100.100.100 is reachable, Round-trip time:0.443 ms
              Remote Cluster IPs:
                  192.168.4.251 is reachable, Round-trip time:0.066 ms
                  192.168.5.251 is reachable, Round-trip time:0.083 ms
        ping from director-2-2-A:
              Remote Discovery IP:
                  224.100.100.100 is reachable, Round-trip time:0.347 ms
              Remote Cluster IPs:
                  192.168.4.251 is reachable, Round-trip time:0.087 ms
                  192.168.5.251 is reachable, Round-trip time:0.087 ms
        ping from director-2-2-B:
              Remote Discovery IP:
                  224.100.100.100 is reachable, Round-trip time:0.397 ms
              Remote Cluster IPs:
                  192.168.4.251 is reachable, Round-trip time:0.088 ms
                  192.168.5.251 is reachable, Round-trip time:0.087 ms
Output to /var/log/VPlex/cli/health_check_full_scan.log
```

Check the back end of a cluster

```
VPlexcli:/> health-check --back-end --verbose
Back End (BE):
Checking Unreachable Storage Volumes....... OK
Checking Degraded Storage Volumes.......... Error
Degraded storage volumes found

 Error

Cluster cluster-1:
  There are 8 storage volumes running in degraded mode.

    Array: EMC-CLARiiON-APM00114102495
      There are 8 storage volumes running in degraded mode.
      First 4 storage volumes in degraded mode are:
      VPD83T3:600601601dd028007a09da1b6427e111 is degraded ['degraded-timeout',
'degraded-read-write-latencies']
      VPD83T3:600601601dd028007fc9ec0e6427e111 is degraded ['degraded-read-write-
latencies']
      VPD83T3:600601601dd0280080c9ec0e6427e111 is degraded ['degraded-timeout',
'degraded-write-latency']
      VPD83T3:600601601dd0280083c9ec0e6427e111 is degraded ['degraded-write-latency']

Checking Unhealthy Virtual Volumes......... OK
Back end array status..................... OK
cluster-1 EMC-CLARiiON-APM00114102495 connectivity status is ok
cluster-1 EMC-SYMMETRIX-195700501 connectivity status is ok
cluster-1 SANBlaze-VLUNP5T0-110d connectivity status is ok
cluster-2 EMC-CLARiiON-APM00114102489 connectivity status is ok
cluster-2 EMC-SYMMETRIX-195700501 connectivity status is ok
cluster-2 SANBlaze-VLUNP13T0-110d connectivity status is ok

Validating paths to back end arrays....... OK

Output to /home/service/vafadm/cli/health_check_full_scan.log
```

Health-check limits on a Metro system.

```
VPlexcli:health-check --limits
Product Version: 6.1.1.00.00.04
Product Type: Metro
WAN Connectivity Type: FC
Hardware Type: VS2
Cluster Size: 2 engines
Cluster TLA:
    cluster-1: FNM00121500305
```

```
     cluster-2: FNM00121300045



Cluster Configuration Limits:
----------------------------
Configuration                                               Maximum
------------------------------------------------------------ -------
Active intra-cluster rebuilds                               25
Maximum WAN latency (RTT) in a VPLEX Metro                  5 ms
Local top-level devices                                     8000
Extents                                                     24000
Storage volumes                                             8000
Virtual volume size                                         64TB
Storage views                                               1000
Clusters                                                    2
Extents per storage volume                                  128
Volumes per Consistency Group                               1000
Storage volume size                                         64TB
IT nexus per cluster in VPLEX                               3200
Distributed devices - includes distributed and local
devices with global visibility                              8000
Total storage provisioned in a system                       8PB
LUNs exported through each IT nexus on VPLEX back-end        4096
Extent block size                                           4 KB
Active inter-cluster rebuilds (on distributed devices)      25
IT nexus per back-end port                                  256
Synchronous Consistency Groups                              1024
RAID 1 mirror legs                                          2
Virtual volumes                                             8000
Minimum bandwidth for VPLEX Metro IP WAN link               3 Gbps
IT nexus per front-end port                                 400
Paths per storage volume per VPLEX director                 4
Minimum bandwidth for VPLEX Metro with RAPIDPath IP WAN link 1 Gbps
```

See also

- `cluster status`
- `validate-system-configuration`

help

Displays help on one or more commands.

Contexts

All contexts.

Syntax

```
help
[-i|--interactive]
[-G|--no-global]
[-n|--no-internal]
```

Arguments

Optional arguments	

`[-i|--interactive]`	Invoke interactive help. Type `quit` to exit interactive help.
`[-G|--no-global]`	Suppresses the list of global commands for contexts other than root context.
`[-n|--internal]`	Include commands that are normally used for low-level debugging and development.

Description

If an argument is marked as required, it is always required. Additional arguments may be required depending on the context in which the command is executed.

Example

Display only commands specific to the current context:

```
VPlexcli:/clusters/cluster-1> help -G
Commands inherited from parent contexts:
add  cacheflush  configdump  expel  forget  shutdown  summary  unexpel
Commands specific to this context and below:
status   verify
```

Display help for a specified command:

```
VPlexcli:/clusters/cluster-1> status --help
synopsis: status [<options>]
Displays a cluster's operational-status and health-state.
options (* = required):
  -h, --help
        Displays the usage for this command.
  --verbose
        Provide more output during command execution.  This may not have any effect
for some commands.
  -c, --clusters= <clusters>
        clusters whose operational-status to display.
Along with the operational-status, an indication of why it could be non-nominal and a
progress indicator are displayed.
Health-state has a similar indicator.
```

Invoke interactive help:

```
VPlexcli:/clusters/cluster-1> help -i
Welcome to Python 2.2!  This is the online help utility.
.
.
.
help> topics
Here is a list of available topics.  Enter any topic name to get more help.
ASSERTION            DYNAMICFEATURES     NONE                TRACEBACKS
ASSIGNMENT           ELLIPSIS            NUMBERMETHODS       TRUTHVALUE
.
.
.
help> EXPRESSIONS
  ----------------------------------------------------------------------
  5.14 Summary
  The following table summarizes the operator precedences in Python, from
  lowest precedence (least binding) to highest precedence (most binding).
.
.
.
```

history

Displays or clears the command history list.

Contexts

All contexts.

Syntax

```
history
[-c|--clear]
[-n|--number] number
```

Arguments

Optional arguments	
`[-c|--clear]`	Clears the history list.
`[-n|--number]` *number*	Displays only the last *number* commands in the history list.

Example

Display the last 8 commands executed in this CLI session:

```
VPlexcli:/> history 8
492 ll
493 cd d
494 cd device-migrations/
495 ll
496 cd
497 ds summary
498 export storage-view checkconfig
499 history 8
```

local-device create

Creates a new local-device.

Contexts

All contexts.

Syntax

```
local-device create
[-d|--stripe-depth] depth
[-n|name] name
```

```
[-g|--geometry] {raid-0|raid-1|raid-c}

[-e|extents] context-path,context-path...

[-s|--source-leg] context-path


--force
```

Arguments

Required arguments	
`[-n|--name]` *name*	* Name for the new device. Must be unique across all clusters. Devices on different clusters that have the same name cannot be combined into a distributed device. ⓘ **NOTE:** If this device will have another device attached (using the `device attach-mirror` command to create a RAID-1), the name of the resulting RAID-1 is the name given here plus a timestamp. Names in metro node are limited to 63 characters. The timestamp consumes 16 characters. Thus, if this device is intended as the parent device of a RAID-1, the device name must not exceed 47 characters.
`[-g|--geometry] {raid-0|raid-1|raid-c}`	* Geometry for the new device. Valid values are `raid-0`, `raid-1`, or `raid-c`. ⚠ **CAUTION: Use this command to create a RAID 1 device only if:** **- None of the legs contains data that must be preserved** **- The resulting device will be initialized using tools on the host** **- The resulting device will be added as a mirror to another device**
`[-e|--extents]` *context-path,context-path...*	* List of one or more claimed extents to be added to the device. Can also be other local devices (to create a device of devices).
Optional arguments	
`[-d|--stripe-depth]` *depth*	Required if `--geometry` is `raid-0`. Stripe depth must be: ● Greater than zero ● No greater than the number of blocks of the smallest element of the RAID 0 device being created ● A multiple of the block size: 4 K bytes A depth of 32 means 128 K (32 x 4 K) is written to the first disk then the next 128 K is written to the next disk. Concatenated RAID devices are not striped.
`[-s|--source-leg]` *context-path*	When geometry argument is `raid-1`, picks one of the extents specified by the `--extents` argument to be used as the source data image for the new device. The command copies data from the `--source-leg` to the other legs of the new device.
`[-f|--force]`	Create a RAID 1 device even if no `--source-leg` is specified.

* - argument is positional.

Description

A device is configured from one or more extents in a RAID 1, RAID 0, or concatenated RAID C configuration.

The block sizes of the supporting extents must be the same (4 K bytes) and determine the local-device block size.

When creating a device with RAID 1 geometry, this command prints a warning and asks for confirmation.

> **⚠ WARNING:** If the `--source-leg` argument is not specified, this command does not initialize or synchronize the legs of a RAID 1 device. Because of this, a RAID 1 device created by this command does not guarantee that consecutive reads of the same block return the same data if the block has never been written.

To create a RAID 1 device when one leg of the device contains data that must be preserved, use the `--source-leg` argument or the `device attach-mirror` command to add a mirror to the leg.

By default, automatic device rebuilds are enabled on all devices. For configurations with limited bandwidth between clusters, it may be useful to disable automatic rebuilds.

Use the `set` command to enable/disable automatic rebuilds on the distributed device. The rebuild setting is immediately applied to the device.

- Set `rebuild-allowed` to true to start or resume a rebuild if the mirror legs are out of sync.
- Set `rebuild-allowed` set to false to stop any rebuild in progress.

  When automatic rebuild is re-enabled on a device where it has been disabled, the rebuild starts again from the place where it stopped.

Examples

In the following example, the `local-device create` command creates a RAID-1 device from 2 extents; `extent_lun_1_1` and `extent_lun_2_1` in which:

- `extent_lun_2_1` is the same size or larger than `extent_lun_1_1`
- `extent_lun_1_1` is the source leg of the new device
- `extent_lun_2_1` is the mirror leg

```
VPlexcli:/> local-device create --geometry raid-1 --extents extent_lun_1_1,
extent_lun_2_1 --name dev_lun_1 --source-leg extent_lun_1_1
VPlexcli:/> ls -al /clusters/cluster-1/devices/
/clusters/cluster-1/devices:
Name          Operational  Health  Block     Block  Capacity  Geometry  Visibility
Transfer  Virtual
-----------   Status       State   Count     Size   --------  --------  ----------  Size
Volume
-----------   -----------  ------  --------  -----  --------  --------  ----------
--------  --------
dev_lun_1     ok           ok      20709376  4K     5G        raid-1    local       -
    -
```

In the following example:

- The `ll` command displays the available (claimed) extents
- The `local-device create` command is used to create a 16 GB RAID 1 device named `TestDevCluster1` on cluster 1
- The `cd` command returns to the root context
- The `ll -p **/devices` command displays the new device

```
VPlexcli:/clusters/cluster-1/storage-elements/extents> ll
Name                  StorageVolume  Capacity  Use
--------------------  -------------  --------  -------
.
.
.
extent_Symm1852_AAC_1  Symm1852_AAC   16G       claimed
extent_Symm1852_AB0_1  Symm1852_AB0   16G       claimed
extent_Symm1852_AB4_1  Symm1852_AB4   16G       claimed
extent_Symm1852_AB8_1  Symm1852_AB8   16G       claimed
VPlexcli:/clusters/cluster-1/storage-elements/extents> local-device create --
name TestDevCluster1 --geometry raid-1 --extents /clusters/cluster-1/storage-
elements/extents/extent_Symm1852_AAC_1,/clusters/cluster-1/storage- elements/extents/
extent_Symm1852_AB0_1
VPlexcli:/clusters/cluster-2/storage-elements/extents> cd
VPlexcli:/> ll -p **/devices
/clusters/cluster-1/devices:
Name              Operational  Health  Block    Block  Capacity  Geometry  Visibility
Transfer  Virtual
```

```
---------------   Status        State     Count     Size      --------   --------   ----------
Size       Volume
---------------   ----------    ------    -------    -----    --------    --------   ----------
--------   ---------
TestDevCluster1   ok            ok        4195200    4K        16G         raid-1     local
2M         -
base0             ok            ok        262144     4K        1G          raid-0     local
-          base0_vol
base1             ok            ok        262144     4K        1G          raid-0     local
-          base1_vol
```

In the above example if both the extents were thin-capable and from same storage array family, the RAID-1 would be thin-capable too. The virtual volume created on top of such a device can be thin-enabled.

- ⓘ **NOTE:** The virtual volume must be built on top of a local RAID 0 device or a RAID 1 device. If you try to create a RAID C local-device with multiple children, or a device that incorporates multiple extents, the created local device is not thin-capable.

- The following example shows how a RAID-C device cannot be thin-capable:

```
VPlexcli:/clusters/cluster-1/storage-elements/extents> local-device create --geometry
raid-c -e
extent_TOP_101_1, extent_TOP_102_1 --name myLocalDevice

You are creating a raid-c local-device on top of 2 thin-capable extents
'extent_TOP_101_1, extent_TOP_102_1'.
The resulting local-device will not be thin-capable.

VPlexcli:/clusters/cluster-1/storage-elements/extents>
```

See also

- `device attach-mirror`
- `local-device destroy`
- `local-device summary`

local-device destroy

Destroys existing local-devices.

Contexts

All contexts.

Syntax

```
local-device destroy
[-f|--force]
[-d|--devices] context-path,context-path...
```

Arguments

Required arguments	
[-d|--devices] context-path,context-path...	* List of one or more device(s) to destroy.
Optional arguments	

`[-f|--force]`	Force the destruction of the devices without asking for confirmation.

* - argument is positional.

Description

The device must not be hosting storage or have a parent device.

Example

```
VPlexcli:/clusters/cluster-1> local-device destroy -d was_1_leg_r1
WARNING: The following items will be destroyed:
Context
-------------------------------------
/clusters/cluster-1/devices/was_1_leg_r1
Do you wish to proceed? (Yes/No)
```

See also

* `local-device create`
* `local-device summary`

local-device summary

Displays unhealthy local devices and a summary of all local devices.

Contexts

All contexts.

In `/clusters/cluster/devices` context, command is summary.

Syntax

```
local-device summary
```

`[-c|--clusters]` *cluster*,*cluster*...

Arguments

Optional arguments	
`[-c|--clusters]` *cluster*,*cluster*...	Display information only for the specified clusters.

Description

Displays unhealthy local devices and a summary of all local devices. Unhealthy devices have non-nominal health state, operational status, or service-status.

If the `--clusters` argument is not specified and the command is executed at or below a `/clusters/`*cluster* context, information for only that cluster is displayed.

Table 11. local device summary field descriptions

Field	Description
`Health`	
`devices`	Number of devices in the cluster.
`unhealthy`	Of the total number of devices in the cluster, the number whose health state is not "ok".
`Visibility`	Of the total number of devices in the cluster, the number with global or local visibility. `global` - The remote cluster can access the virtual volume. A virtual volume on a top-level device that has global visibility can be exported in storage views on any cluster. `local` (default) - Device is visible only to the local cluster.
`Capacity`	
`devices w/ space`	Of the total number of devices in the cluster, the number with available space.
`free capacity`	Total free capacity on the cluster.
`total capacity`	Total capacity of the cluster.

Example

Display local devices for a specified cluster:

```
VPlexcli:/> local-device summary --clusters cluster-1
device name      health state        operational status  service status
--------------   ----------------    ------------------   --------------
dev_sym1723_1FC  critical-failure    error                suspended
Device Summary   (no tier)
-------------    --------------------
Health           devices             5
                 unhealthy           1
Visibility       local               5
Capacity         devices w/ space    0
                 free capacity       0B
                    total capacity   12G
```

See also

- `ds summary`
- `export port summary`
- `export storage-view summary`
- `extent summary`
- `storage-volume summary`

log filter create

Adds a new firmware log filter.

Contexts

All contexts.

Syntax

```
log filter create
[-s|--source] id
[-t|--threshold] [<|>|=]0 - 7
[-c|--component] name
[-e|--event-num] id
[-m|--message] text
[-n|--no-consume]
```

Arguments

Optional arguments	
`[-s|--source]` id	ID of the source log to be filtered. Use the log source list command to display the list of source logs and their IDs.
`[-t|--threshold]` `[<|>|=]0 - 7`	Severity of the events to write to the new log. Messages are categorized into 8 severities (0 - 7), with 0 being the most severe: `7` - debug (debug-level messages) `6` - info (informational messages) `5` - notice (normal but significant messages) `4` - warning (warning messages) `3` - err (error messages) `2` - crit (critical messages) `1` - alert (messages that must be handled immediately) `0` - emerg (messages notifying the system as unusable) Default modifier is>.
`[-c|--component]` name	Component name to filter. Takes a regular expression as an argument. Plain strings are searched for in the component name.
`[-e|--event-num]` id	Used in conjunction with a specified component. An event ID to filter.
`[-m|--message]` text	An expression to look for in the event message. Takes a regular expression as an argument. Plain strings are searched for in the message text.
`[-n|--no-consume]`	Do not halt event processing after an event matches a filter.

Description

Log filters define criteria for the destination of specific log data. A filter is placed in an ordered list, and filters see received events in the order they sit in the list (shown by the `log filter list` command).

By default, filters consume received events so that a matching filter stops the processing of the event. Use the `--no-consume` argument to create a filter that allows processing of matching events to continue.

Example

Filter out (hide) all messages with the string test in them:

```
VPlexcli:/> log filter create -m "test"
Filter added.
```

Filter all messages into the events log generated by the logserver component with the string Test:

```
VPlexcli:/> log filter create --source 1 --component logserver --message Test
Filter added.
VPlexcli:/> log filter list
1. [Source='/var/log/VPlex/cli/events.log', Component='logserver', Message matches
'Test'] Destination='null' Consume='true'
2. Component='logserver' Destination='null' Consume='true'
3. [Threshold='>0'] Destination='null' Consume='true'
```

See also

* `log filter destroy`
* `log filter list`

log filter destroy

Removes a firmware log filter.

Contexts

All contexts.

Syntax

```
log filter destroy
[-f|--filter] filter
```

Arguments

Required arguments	
`[-f|--filter]` *filter*	ID of filter to delete.

Description

The filter is removed from the filter stack.

Use the `log filter list` command to display the filters configured on the system, and associated IDs of those filters.

Example

```
VPlexcli:/> log filter list
1. [Source='/var/log/VPlex/cli/events.log', Component='logserver', Message matches
'Test'] Destination='null' Consume='true'
2. Component='logserver' Destination='null' Consume='true'
3. [Threshold='>0'] Destination='null' Consume='true'
```

```
VPlexcli:/> log filter destroy 1
Filter removed.
```

See also

- log filter create
- log filter list

log filter list

Lists firmware log filters, in the order that they see events.

Contexts

All contexts.

Syntax

```
log filter list
```

Description

The number printed beside each filter serves as both an identifier for the log filter destroy command as well as the order in which each respective filter will see an event.

Example

```
VPlexcli:/> log filter list
1. [Message matches 'Family and Fru Id Mismatch Retrieved'] Destination='null'
Consume='true'
2. [Component='logserver'] Destination='null' Consume='true'
3. [Threshold='>=4'] Destination='null' Consume='true'
```

See also

- log filter create
- log filter destroy

log source create

Adds a firmware log source.

Contexts

All contexts.

Syntax

```
log source create

[-s|--source] host:port

[-p|--password] password

[-f|--failover-source] host:port
```

Arguments

Required arguments	
`[-s|--source]` *host:port*	* IP address and port of the log source to be added. IP addresses of the metro node hardware components are listed in the metro node Installation and Setup Guide.
`[-p|--password]` *password*	
Optional arguments	The password to use for authenticating to the source.
`[-f|--failover-source]` *host:port*	IP address and port of the failover source to be added.

* argument is positional.

Description

⚠ **CAUTION: For use by Dell EMC personnel only.**

Creates a source for writing entries to the firmware log.

Example

```
VPlexcli:/> log source create --source 128.221.252.69:5988
Enter the source connection password:
VPlexcli:/> log source list
1. /var/log/VPlex/cli/events.log
.
.
.
6. [128.221.252.69:5988]/cpu0/log
7. [128.221.252.69:5988]/xmmg/log
```

See also

* `log source destroy`
* `log source list`

log source destroy

Destroys the specified log source.

Contexts

All contexts.

Syntax

```
log source destroy
[-s|--source] host:port
```

Arguments

Required arguments	
[-s|--source] host:port	IP address and port of the log source to destroy. IP addresses of the metro node hardware components are listed in the metro node Installation and Setup Guide.

Description

⚠ **CAUTION: For use by Dell EMC personnel only.**

Example

```
VPlexcli:/> log source list
1. /var/log/VPlex/cli/events.log
2. 128.221.252.67:5988,[128.221.253.67:5988]/cpu0/log
3. 128.221.252.67:5988,[128.221.253.67:5988]/xmmg/log
4. 128.221.253.68:5988,[128.221.252.68:5988]/cpu0/log
5. 128.221.253.68:5988,[128.221.252.68:5988]/xmmg/log
6. [128.221.252.69:5988]/cpu0/log
7. [128.221.252.69:5988]/xmmg/log
8. [128.221.252.70:5988],128.221.253.70:5988/cpu0/log
9. [128.221.252.70:5988],128.221.253.70:5988/xmmg/log
VPlexcli:/> log source destroy --source 128.221.252.69:5988
```

See also

- `log source create`
- `log source list`

log source list

Lists the various log paths from which log events are processed.

Contexts

All contexts.

Syntax

```
log source list
```

Description

Lists the log paths from which log events are processed and their reference IDs.

Used to create log filters.

Example

```
VPlexcli:/> log source list
1. /var/log/VPlex/cli/events.log
2. 128.221.252.35:5988,[128.221.253.35:5988]/xmmg/log
3. 128.221.252.36:5988,[128.221.253.36:5988]/cpu0/log
4. [128.221.252.35:5988],128.221.253.35:5988/cpu0/log
5. [128.221.252.36:5988],128.221.253.36:5988/xmmg/log
```

See also

- `log filter create`
- `log source create`

logging-volume add-mirror

Adds a logging volume mirror.

Contexts

All contexts.

Syntax

```
logging-volume add-mirror
[-v|--logging-volume] logging-volume
[-m|--mirror] {name|context-path}
```

Arguments

Optional arguments	
`[-v|--logging-volume]` *logging-volume*	Logging volume to which to add the mirror.
`[-m|--mirror]` {*name|context-path*}	The name or context path of the device or storage-volume extent to add as a mirror. Must be top-level device or a storage-volume extent.

See also

- `logging-volume create`
- `logging-volume destroy`

logging-volume create

Creates a new logging volume in a cluster.

Contexts

All contexts.

Syntax

```
logging-volume create
[-n|--name] name
[-e|--extents] context-path,context-path...
```

Arguments

Required arguments	
`[-n|--name]` *name*	* Name for the new logging volume.
`[-e|--extents]` *context-path,context-path...*	* List of one or more storage-volume extents to use to create the logging volume. Must not be empty, and must contain storage-volume extents that are all at the specified cluster. Entries must be separated by commas.

* - argument is positional.

Description

Creates a logging volume. The new logging volume is immediately available for use with distributed-devices.

A logging volume is required on each cluster in metro node Metro configurations. Each logging volume must be large enough to contain one bit for every page of distributed storage space (approximately 10 GB of logging volume space for every 160 TB of distributed devices).

Logging volumes experience a large amount of I/O during and after link outages. Best practice is to stripe each logging volume across many disks for speed, and to have a mirror on another fast disk.

To create a logging volume, first claim the storage volumes that will be used, and create extents from those volumes.

- Use the `ll /clusters/cluster/storage-elements/storage-volumes` command to display the available storage volumes on the cluster.
- Use the `storage-volume claim -n storage-volume_name` command to claim one or more storage volumes.
- Use the extent `create -d` *storage-volume_name*, *storage-volume_name* command to create an extent to use for the logging volume.

  Repeat this step for each extent to be used for the logging volume.

Table 12. logging volume display fields

Field	Description
`application-consistent`	Whether or not this storage volume is application-consistent.
`biggest-free-segment-block-count`	The block count of the largest remaining free segment in the logging volume. This is the upper limit on the size of a new allocated segment.
`block-count`	The number of blocks in the volume.
`block size`	The size of a single block, in kilobytes.

Table 12. logging volume display fields (continued)

Field	Description
capacity	The total number of bytes in the volume. Equals the `block-size` multiplied by the `block-count`.
component-count	The number of mirrors in this raid-1 logging volume.
free-capacity	The number of free slots for storage-volume headers in this logging volume.
geometry	Indicates the geometry or redundancy of this device. Will always be raid-1.
health-indications	If health-state is not "ok", additional information.
health-state	`ok` - The storage volume is functioning normally. `degraded` - The storage volume may be out-of-date compared to its mirror. (This state applies only to a storage volume that is part of a RAID 1 Metadata Volume.) `unknown` - Metro node cannot determine the storage volume's Health state, or the state is invalid. `non-recoverable error` - The storage volume may be out-of-date compared to its mirror (applies only to a storage volume that is part of a RAID 1 Metadata Volume), and/or metro node cannot determine the Health state. `critical failure` - Metro node has marked the storage volume as hardware-dead.
locality	Locality of the supporting device. `local` - The volume is local to the enclosing cluster. `remote` - The volume is made available by a different cluster than the enclosing cluster, and is accessed remotely. `distributed` - The virtual volume either has, or is capable of having, legs at more than one cluster. *}
operational status	`ok` - The storage volume is functioning normally. `degraded` - The storage volume may be out-of-date compared to its mirror. (This state applies only to a storage volume that is part of a RAID 1 Metadata Volume.) `unknown` - Metro node cannot determine the storage volume's Health state, or the state is invalid. `error` - Metro node has marked the storage volume as hardware-dead. `starting` - The storage volume is not yet ready. `lost-communication` - The storage volume is unreachable.
rebuild-allowed	Whether or not this device is allowed to rebuild.
rebuild-eta	The estimated time remaining for the current rebuild to complete.
rebuild-progress	The percentage of this device that has been rebuilt.
rebuild-status	The rebuild status of this device.
rebuild-type	The rebuild type. `full` - A full copy of all the blocks. `incremental` - Uses a checksum differencing algorithm to transfer only those (chunks of) blocks that are different. `comparison` - A comparison copy.

Table 12. logging volume display fields (continued)

Field	Description
	• `resync` - A resync rewrites blocks that may have been affected by a director failure, guaranteeing that the mirror legs are identical.
`stripe-depth`	The depth of a stripe in bytes when `geometry` is `raid-0`.
`supporting-device`	The local, remote, or distributed device underlying the virtual volume.
`system-id`	Name assigned to the logging-volume.
`transfer-size`	The transfer size during rebuild in bytes. See About transfer-size in the batch-migrate start command.
`volume-type`	For logging volumes, this is always logging-volume.
/components context	
`Name`	Name of the extent.
`Slot number`	The slot number of the component.
`Type`	Indicates the type of component: a storage-volume, extent, or device.
`Operational Status`	The operational status for the entity. This indicates whether the entity is functioning, and if so, how well it is functioning.
`Health State`	Represents an overview of the health of the extent.
`Capacity`	Represents an overview of the capacity of the extent.
/segments context	
`Name`	Name of the segment.
`Starting block`	Always 0.
`Block count`	Number of blocks in the segment.
`Use`	Indicates how the segment is used.

Example

```
VPlexcli:/clusters/cluster-1/system-volumes> logging-volume create -n c1_log_vol -e
extent_1 , extent_2
VPlexcli:/clusters/cluster-1/system-volumes> cd c1_log_vol
VPlexcli:/clusters/cluster-1/system-volumes/c1_log_vol> ll /clusters/cluster-1/system-
volumes/c1_log_vol
/clusters/cluster-1/system-volumes/c1_log_vol:
Attributes:
Name                             Value
-------------------------------  -------------
application-consistent           false
biggest-free-segment-block-count 2612155
block-count                      2621440
block-size                       4K
capacity                         10G
component-count                  1
free-capacity                    9.97G
geometry                         raid-0
health-indications               []
health-state                     ok
locality                         local
operational-status               ok
rebuild-allowed                  -
rebuild-eta                      -
rebuild-progress                 -
```

```
rebuild-status                       -
rebuild-type                         -
stripe-depth                         4K
supporting-device                    logging_c1_log
system-id                            logging_c1_log
transfer-size                        -
volume-type                          logging-volume
Contexts:
Name        Description
----------  ----------------------------------------------------------------
components  The list of components that support this logging-volume.
segments    Shows what parts of the logging volume are assigned to log changes
            on distributed-device legs.
VPlexcli:/clusters/cluster-1/system-volumes/c1_log_vol> ll /clusters/cluster-1/system-
volumes/c1_log_vol/components
/clusters/cluster-1/system-volumes/c1_log_vol/components:
Name                    Slot      Type    Operational      Health    Capacity
----------------------  Number    ------  Status           State     --------
----------------------  --------  ------  ---------------  --------  --------
extent_VNX-1912_LUN10_1  0        extent  ok               ok        15G
extent_VNX-1912_LUN11_1  1        extent  ok               ok        15G
VPlexcli:/clusters/cluster-1/system-volumes/c1_log_vol> ll /clusters/cluster-1/system-
volumes/c1_log_vol/segments
/clusters/cluster-1/system-volumes/c1_log_vol/segments:
Name                                                        Starting  Block    Use
----------------------------------------------------------  Block     Count
----------------------------------------------------------  --------  -------
allocated-c1_dr1ActC1_softConfig_CHM_C1_0000                1084      17       allocated
for

c1_dr1ActC1_softConfig_CHM_C1_0000
allocated-c1_dr1ActC1_softConfig_CHM_C1_0001                1118      17       allocated
for

c1_dr1ActC1_softConfig_CHM_C1_0001
.
.
.
allocated-r0_deviceTgt_C2_CHM_0001                          2077      17       allocated
for r0_deviceTgt_C2_CHM_0001
allocated-r1_mirrorTgt_C1_CHM_0001                          2060      17       allocated
for r1_mirrorTgt_C1_CHM_0001
free-1057                                                   1057      10       free
free-2094                                                   2094      3930066  free
free-40                                                     40        2        free
free-82                                                     82        2        free
VPlexcli:/clusters/cluster-1/system-volumes/c1_log_vol>
```

See also

- extent create
- logging-volume add-mirror
- logging-volume destroy
- storage-volume claim

logging-volume detach-mirror

Detaches a mirror from a logging volume.

Contexts

All contexts.

Syntax

```
logging-volume detach-mirror
[-m|--mirror] mirror
[-v|--logging-volume] logging-volume
[-s|--slot] slot-number
[-h|--help]
[--verbose]
```

Arguments

Optional arguments	
[-m|--mirror] *mirror*	* Specifies the name or context path of the logging volume mirror to detach. If you specify the mirror, do not specify the slot number.
[-v|--logging-volume] *logging-volume*	Specifies the name of the logging volume from which to detach the mirror.
[-s|--slot] *slot-number*	Specifies the slot number of the mirror to detach. If you specify the slot number, do not specify the mirror.
[-h|--help]	Displays command line help.
[--verbose]	Provides more output during command execution. This may not have any effect for some commands.

* - argument is positional.

Description

This command detaches a mirror from a logging-volume. The logging-volume must have a RAID1 geometry and the mirror must be a direct child of the logging-volume.

You must specify the --slot or --mirror option but not both.

To detach a mirror from a component of a logging-volume use the device detach-mirror command.

Example

Lists the attributes of the logging volume:

```
VPlexcli:/clusters/Hopkinton/system-volumes> ll logging_vol/
/clusters/Hopkinton/system-volumes/logging_vol:
Attributes:
Name                             Value
-------------------------------  -------------
application-consistent           false
biggest-free-segment-block-count 2620324
block-count                      2621440
block-size                       4K
capacity                         10G
component-count                  1
free-capacity                    10G
geometry                         raid-1
health-indications               []
health-state                     ok
locality                         local
operational-status               ok
provision-type                   legacy
rebuild-allowed                  true
```

```
rebuild-eta                     -
rebuild-progress                -
rebuild-status                  done
rebuild-type                    full
stripe-depth                    -
supporting-device               logging
system-id                       logging
transfer-size                   128K
volume-type                     logging-volume
Contexts:
Name        Description
----------  -------------------------------------------------------------------
components  The list of components that support this logging-volume.
segments    Shows what parts of the logging volume are assigned to log
                    changes on distributed-device legs.
```

Lists the logging volume components:

```
VPlexcli:/clusters/Hopkinton/system-volumes> ll logging_vol/components/
/clusters/Hopkinton/system-volumes/logging_vol/components:
Name                             Slot     Type    Operational  Health  Capacity
------------------------------   Number   ------  Status       State   -------
------------------------------   -------  ------  -----------  ------  -------
extent_CLARiiON1389_LUN_00023_1  0        extent  ok           ok      10G
```

Specify the name of the mirror to detach:

```
VPlexcli:/clusters/Hopkinton/system-volumes> logging-volume detach-mirror --mirror
extent_CLARiiON1389_LUN_00023_1/*
```

Specify the slot number of the mirror to detach:

```
VPlexcli:/clusters/Hopkinton/system-volumes> logging-volume detach-mirror --logging-
volume logging_vol/ --slot 0
```

See also

- logging-volume add-mirror
- logging-volume create
- logging-volume destroy

logging-volume destroy

Destroys an existing logging volume.

Contexts

All contexts.

Syntax

```
logging-volume destroy
[-v|--logging-volume] logging-volume
```

Arguments

Required arguments	

`[-v|--logging-volume]` *logging-volume*	* Name of logging volume to destroy.

* - argument is positional.

Description

The volume to be destroyed must not be currently used to store block write logs for a distributed-device.

Example

```
VPlexcli:/clusters/cluster-1/system-volumes> logging-volume destroy --logging-volume
cluster_6_log_vol
```

See also

- `logging-volume add-mirror`
- `logging-volume create`
- `logging-volume detach-mirror`

logical-unit forget

Forgets the specified logical units (LUNs).

Contexts

All contexts.

Syntax

```
logical-unit forget
[-s|--forget-storage-volumes]
[-u|--logical-units] context-path,context-path,...
```

Arguments

Required arguments	
`[-u|--logical-units]` *context-path*	List of one or more LUNs to forget.
Optional arguments	
`[-s|--forget-storage-volumes]`	If a LUN has an associated storage-volume, forget it AND the associated storage-volume.

Description

Forget one or more logical units (LUNs). Optionally, forget the storage volume if one is configured on the LUN. This command attempts to forget each LUN in the list specified, logging/displaying errors as it goes.

A logical unit can only be forgotten if it has no active paths. LUNs can be remembered even if a cluster is not currently in contact with them. This command tells the cluster that the specified LUNs are not coming back and therefore it is safe to forget about them.

If a specified LUN has an associated storage-volume, that LUN is skipped (is not forgotten).

Use the `--verbose` argument to print a message for each volume that could not be forgotten.

Use the `--forget-storage-volume` argument to forget the logical unit AND its associated storage-volume. This is equivalent to using the storage-volume forget command on those storage-volumes.

Example

Forget the logical units in the current logical unit context:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-arrays/EMC-SYMMETRIX-192602773/
logical-units> logical-unit forget
13 logical-units were forgotten.
102 logical-units have associated storage-volumes and were not forgotten
```

Use the `--verbose` arguments to display detailed information about any logical units that could not be forgotten:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-arrays/EMC-SYMMETRIX-192602773/
logical-units> logical-unit forget --forget-storage-volumes --verbose
WARNING: Error forgetting logical-unit: Logical-unit
'VPD83T3:6006016030802100e405a642ed16e111'has active paths and cannot be forgotten.
.
.
.
WARNING: Error forgetting storage-volume 'VPD83T3:60000970000192602773533030353933':
The 'use' property of storage-volume VPD83T3:60000970000192602773533030353933'
is 'meta-data' but must be 'unclaimed' or 'unusable' before it can be forgotten.
.
.
.
13 logical-units were forgotten:
VPD83T3:60000970000192602773533030353777
.
.
.
11 storage-volumes were forgotten:
VPD83T3:6006016030802100e405a642ed16e1099
.
.
.
```

See also

- `storage-volume forget`

ls

Displays information about the current object or context.

Contexts

All contexts.

Syntax

```
ls
   [-l|--long]
   [-a|--attributes]
   [-A|--no-attributes]
   [-t|--attribute] selector
   [-p|--paged]
   [-m|--commands]
   [-f|--full]
   [-C|--no-contexts]
   [-x |--cache-max-age]
context,[[context]...]
```

Arguments

Optional arguments	
`[-l|--long]`	Display more detailed information.
`[-a|--attributes]`	Includes the attributes of the target contexts.
`[-A|--no-attributes]`	Excludes attributes.
`[-t|--attribute-selector]` *attribute-selector*	Display the contents of the specified attributes.
`[-p|--paged]`	Page output if it is longer than the window height.
`[-m|--commands]` *depth*	Includes commands in the listing.
`[-f|--full]`	Do not summarize long attribute listings.
`[-C|--no-contexts]`	Excludes contexts from the listing.
`[-x|--cache-max-age]`	Maximum age of cached context data to be considered fresh enough. Default: 0, which always triggers a refresh.

Description

The contents of a context include: its child contexts; its attributes; and the available commands.

The context name can be any valid glob pattern.

The VPLEX CLI includes `ll`, a pre-defined alias of `ls -a`.

Example

Display a device's attributes:

```
VPlexcli:/> ls -C /clusters/cluster-8/devices/device_CLAR0014_LUN04_1
/clusters/cluster-8/devices/device_CLAR0014_LUN04_1:
Name                   Value
---------------------  ----------------------
application-consistent false
block-count            2621440
block-size             4K
capacity               10G
geometry               raid-0
health-indications     []
health-state           ok
locality               local
operational-status     ok
rebuild-allowed        -
rebuild-eta            -
```

```
rebuild-progress         -
.
.
.
```

Use the `--attribute` argument to display the operational status of all directors:

```
VPlexcli:/>  ls --attribute /clusters/*/directors/*::operational-status
/clusters/cluster-1/directors/dirB:
Name               Value
-----------------  -----
operational-status  ok
/clusters/cluster-1/directors/dirA:
Name               Value
-----------------  -----
operational-status  ok
.
.
.
```

Display a cluster's attributes and the contexts below the cluster context:

```
VPlexcli:/> ls /clusters/cluster-1
/clusters/cluster-1:
Attributes:
Name                      Value
--------------------      ------------
allow-auto-join           true
auto-expel-count          0
auto-expel-period         0
auto-join-delay           0
cluster-id                1
connected                 true
default-cache-mode        synchronous
default-caw-template      true
default-write-same-16-template  true
default-xcopy-template    true
director-names            [director-1-1-A, director-1-1-B]
island-id                 1
top-level-assembly        FNM00151000986
operational-status        ok
transition-indications    []
transition-progress       []
health-state              ok
health-indications        []


Contexts:
connectivity   consistency-groups               devices         exports performance-
policies  storage-elements
system-volumes  uninterruptible-power-supplies  virtual-volumes
```

Use a glob pattern to display all the fans:

```
VPlexcli:/> ls --long /**/fans
```

Use a glob pattern to display:

- All fans
- All the uninterruptable power supply settings:

```
VPlexcli:/> ls --long /**/fans, /**/uninterruptible-power- supplies/*
```

Use the --attribute-selector argument to display the contents of the 'virtual-volumes' attribute on all views:

```
VPlexcli:/> ls --attribute /clusters/*/exports/storage-views /*::virtual-volumes
```

See also

- `alias`

meta-volume attach-mirror

Attaches a storage-volume as a mirror to a meta-volume.

Contexts

All contexts.

Syntax

```
meta-volume attach-mirror
[-d|--storage-volume] context-path
[-v|--meta-volume] context-path
```

Arguments

Required arguments	
`[-d|--storage-volume]` *context-path*	Storage-volume to attach as a mirror to the meta-volume.
`[v|--meta-volume]` *context-path*	Meta-volume to which the storage volume should be attached as a mirror.

Description

Creates a mirror and backup of the specified meta-volume. The specified storage volumes must be:

- Not empty.
- At the implied or specified cluster.
- Unclaimed.
- 78 GB or larger.
- 20 GB or larger.

Dell EMC recommends you create a mirror and a backup of the meta-volume using at least two disks from two different arrays.

ⓘ **NOTE:** You can attach a mirrorwhen the meta-volume is first created by specifying two storage volumes.

Example

Attach storage volume `VPD83T3:6…ade11` as a mirror to the existing meta-volume `_dmx`:

```
VPlexcli:/clusters/cluster-1/directors> meta-volume attach-mirror --storage-volume
VPD83T3:6006016023901d00484f496fa07ade11 --meta-volume _dmx
-volume _dmx is created at /clusters/cluster-1/system-volumes.
```

See also

- `meta-volume detach-mirror`

meta-volume backup

Creates a new meta-volume and writes the current in-memory system data to the new meta-volume without activating it.

Contexts

All contexts.

Syntax

```
meta-volume backup
[-d|--storage-volumes] context-path,context-path...
[-c|--cluster] context-path
[-f|--force]
```

Arguments

Required arguments	
[-d|--storage-volume] *context-path*	* List of two or more storage volumes to use in creating the backup meta-volume. The specified storage-volumes must be: ● Not empty ● At the implied or specified cluster ● Unclaimed ● 78 GB or larger. ● 20 GB or larger Type the system IDs for multiple (two or more) storage volumes, separated by commas.
Optional arguments	
[-c|--cluster] *context-path*	The cluster whose active meta-volume will be backed-up.
[-f|--force]	Forces the backup meta-volume to be activated without asking for confirmation.

* - argument is positional.

Description

Backup creates a point-in-time copy of the current in-memory metadata without activating it. The new meta-volume is named:

`current-metadata-namebackup_yyyyMMMdd_HHmms`

Metadata is read from the meta-volume only during the boot of each director.

Create a backup meta-volume:

● As part of an overall system health check before a major migration or update.
● If the system permanently loses access to both meta-volumes.
  ⓘ **NOTE:** No modifications should be made to the system during the backup procedure. Make sure that all other users are notified.

Use the `ll` command in the `system-volumes` context to verify that the meta-volume is `Active` and its `Ready` state is `true`.

Example

Back up the metadata to a RAID 1 of two specified storage volumes:

```
VPlexcli:/> meta-volume backup --storage-volumes
VPD83T3:6006048000019030048753303035463, VPD83T3:6006048000019030048753303034345
```

See also

- `meta-volume create`
- `meta-volume destroy`

meta-volume create

Creates a new meta-volume in a cluster when there is no existing active meta-volume.

Contexts

All contexts.

Syntax

```
meta-volume create
[-n|--name] name
[-d|--storage-volumes] context-path,context-path...
[-f|--force]
```

Arguments

Required arguments	
`[-n|--name]` name	* Name of the new meta-volume.
`[-d|--storage-volume]` context-path	* List of two or more storage volumes to use in creating the new meta-volume. The specified storage volumes must not be empty, and must be at the implied or specified cluster.
	Type the system IDs for the storage volumes separated by commas.
	ⓘ **NOTE:** Specify two or more storage volumes. Storage volumes should be on different arrays.
Optional arguments	
`[f|--force]`	Forces the meta-volume to be created without asking for confirmation.

* - argument is positional.

Description

Metadata includes virtual-to-physical mappings, data about devices, virtual volumes, and configuration settings.

Metadata is stored in cache and backed up on a specially designated external volume called the meta-volume.

The meta-volume is critical for system recovery. The best practice is to mirror the meta-volume across two or more back-end arrays to eliminate the possibility of data loss. Choose the arrays used to mirror the meta-volume such that they are not required to migrate at the same time.

Meta-volumes differ from standard storage volumes in that:

- A meta-volume is created without first being claimed,
- Meta-volumes are created directly on storage volumes, not extents.

  △ **CAUTION: If the meta-volume is configured on a CLARiiON array, it must not be placed on the vault drives of the CLARiiON.**

Performance is not critical for meta-volumes. The minimum performance allowed is 40 MB/sec and 100 4 K IOP/second.

The physical spindles for meta-volumes should be isolated from application workloads.

Dell EMC recommends the following for meta-volumes:

- Read caching enabled.
- A *hot spare* meta-volume pre-configured in case of a catastrophic failure of the active meta-volume.
- Minimum of 78 GB.
- Minimum of 20 GB.

If two or more storage-volumes are specified, they must be on two separate arrays if more than one array is present. This command creates a RAID 1 of all the storage volumes.

Examples

In the following example:

- The `configuration show-meta-volume-candidates` command displays possible candidates:

ⓘ **NOTE:** Example out put is truncated. Vendor, IO Status, and Type fields are omitted.

  - The `meta-volume create` command creates a new mirrored volume using the 2 specified storage volumes.
  - The `ll` command displays the new meta-volume.

```
VPlexcli:/> configuration show-meta-volume-candidates

Name                                      Capacity...Array Name
----------------------------------------  --------   ----------------------------------
VPD83T3:600604800001901005475330303645 39  187G .....EMC-SYMMETRIX-190100547
VPD83T3:6000097000019260170753303133132 98.5G.....EMC-SYMMETRIX-192601707
VPD83T3:6000097000019260170753303133133 98.5G.....EMC-SYMMETRIX-192601707
VPD83T3:6000097000019260170753303133134 98.5G.....EMC-SYMMETRIX-192601707
VPD83T3:6000097000019260170753303133135 98.5G.....EMC-SYMMETRIX-192601707
VPD83T3:6000097000019260170753303133136 98.5G.....EMC-SYMMETRIX-192601707
VPD83T3:6000097000019260170753303133137 98.5G.....EMC-SYMMETRIX-192601707
VPD83T3:6000097000019260170753303133138 98.5G.....EMC-SYMMETRIX-192601707
VPD83T3:6006016049e02100442c66c8890ee011 80G ......EMC-CLARiiON-FNM00083800068
l
.
.
.
VPlexcli:/> meta-volume create --name c1_meta -storage-volumes
VPD83T3:6000097000019260170753303133136, VPD83T3:600604800001903004875 33030343445

VPlexcli:/> cd /clusters/cluster-1/system-volumes

VPlexcli:/clusters/cluster-1/system-volumes>  ll c1_meta

/clusters/cluster-1/system-volumes/c1_meta:
Attributes:
Name                   Value
---------------------  ----------
active                 true
application-consistent false
block-count            20971264
block-size             4K
capacity               80G
component-count        2
free-slots             27199
```

```
geometry              raid-1
health-indications    []
health-state          ok
locality              local
operational-status    ok
ready                 true
rebuild-allowed       true
rebuild-eta           -
rebuild-progress      -
rebuild-status        done
rebuild-type          full
slots                 32000
stripe-depth          -
system-id             c1_meta
transfer-size         128K
volume-type           meta-volume
Contexts:
Name       Description
---------- ---------------------------------------------------------------
components The list of components that support this device or system virtual
           volume.

VPlexcli:/> ll clusters/cluster-1/system-volumes/meta_volume_site1
  /clusters/cluster-1/system-volumes/meta_volume_site1:
  Attributes:
  Name                  Value
  --------------------  -----------------
  active                true
  application-consistent false
  block-count           5242624
  block-size            4K
  capacity              20G
  component-count       3
  free-slots            7858
  geometry              raid-1
  health-indications    []
  health-state          ok
  locality              local
  operational-status    ok
  ready                 true
  rebuild-allowed       true
  rebuild-eta           -
  rebuild-progress      -
  rebuild-status        done
  rebuild-type          full
  slots                 8000
  stripe-depth          -
  system-id             meta_volume_site1
  transfer-size         2M
  vias-based            false
  volume-type           meta-volume
  Contexts:
  Name       Description
  ---------- ---------------------------------------------------------------
  components The list of components that support this device or system virtual volume.
```

```
VPlexcli:/> configuration show-meta-volume-candidates
  Name                                   Capacity...        Array Name
  -------------------------------------- --------
--------------------------
  VPD83T3:6006048c460345d122db7605e8b18863  45G
EMC-Celerra-APM00140825464
  VPD83T3:6006048c54c01376339c6efc9542317c  20G
EMC-Celerra-APM00140825464
  VPD83T3:6006048c5b272e8526c2203c6d56dc88  100G                    EMC-Celerra-
APM00140825464
  VPD83T3:6006048c8918b7022b8ca80efbaa7fa0  45G
EMC-Celerra-APM00140825464
  VPD83T3:6006048cbc54f178bb648e9d48a3cd7c  45G
EMC-Celerra-APM00140825464
  VPD83T3:6006048cbf68882ef8b8031ba611ad77  20G
EMC-Celerra-APM00140825464
```

See also

meta-volume destroy

Destroys a meta-volume, and frees its storage volumes for other uses.

Contexts

All contexts.

Syntax

```
meta-volume destroy
[-v|--meta-volume] context-path
[-f|--force]
```

Arguments

Required arguments	
`[-v|--meta-volume]` *context-path*	- * Meta-volume to destroy.
Optional arguments	
`[f|--force]`	- Destroys the meta-volume without asking for confirmation (allows the command to be run from a non-interactive script). Allows the meta-volume to be destroyed, even if the meta-volume is in a failed state and unreachable.

* - argument is positional.

Description

The meta-volume cannot be destroyed if its `active` attribute is true.

Example

In the following example:

- `ll` displays that the target meta-volume has an active state of false.
- The meta-volume destroy command destroys the meta-volume:

```
VPlexcli:/clusters/cluster-1/system-volumes> ll meta1
/clusters/cluster-1/system-volumes/meta1:
Attributes:
Name                    Value
--------------------    ----------
active                  false
application-consistent  false
```

```
block-count          23592704
.
.
.
VPlexcli:/clusters/cluster-1/system-volumes> meta-volume destroy -v meta1
Meta-volume 'meta1' will be destroyed. Do you wish to continue? (Yes/No) y
```

See also

- `meta-volume create`

meta-volume detach-mirror

Detaches a storage-volume/mirror from a meta-volume.

Contexts

All contexts.

Syntax

```
meta-volume detach-mirror
[-d|--storage-volume] context-path
[-v|--meta-volume] context-path
[-s|--slot] slot-number

[f|--force]
--discard
```

Arguments

Required arguments	
`[-d|--storage-volume]` *context-path*	Storage volume to detach as a mirror from the meta-volume.
`[-v|--meta-volume]` *context-path*	* The meta-volume from which the storage-volume/mirror should be detached.
Optional arguments	
`[-f|--force]`	Force the mirror to be discarded. Required when the `--discard` argument is used.
`[-s|--slot]` *slot-number*	The slot number of the mirror to be discarded. Applicable only when the `--discard` argument is used.
`[-u|--detach-unreachable-mirror]`	Supports the discard of an unreachable mirror.
`--discard`	Discards the mirror to be detached. The data is not discarded.

* - argument is positional.

Description

Detaches the specified storage volume from a meta-volume.

Use the `ll` command in `/clusters/cluster/system-volumes/meta-volume/`components context to display the slot number when using the discard argument.

Example

```
VPlexcli:/clusters/cluster-1/system-volumes/meta-vol-1/components> ll
Name                                      Slot    Type           Operational  Health
Capacity
--------------------------------------    Number  -------------  Status       State
--------
--------------------------------------    ------  -------------  -----------  ------
--------
VPD83T3:600009700001926018695330303730  2       storage-volume ok           ok
128G
VPD83T3:600009700001949004975330303338  1       storage-volume ok           ok
128G
VPlexcli:/clusters/cluster-1/system-volumes/meta-vol-1/components> meta-volume detach-
mirror --storage-volume VPD83T3:600009700001949004975330303338 --meta-volume meta-vol-1
```

See also

- `meta-volume attach-mirror`

meta-volume move

Writes the current in-memory system data to the specified target meta-volume, then activates it.

Contexts

All contexts.

Syntax

```
meta-volume move
[-t|--target-volume] context-path
```

Arguments

Required arguments	
[-t|--target-volume] *context-path*	Storage volume to move metadata to. Target volume must be: ● Unclaimed. ● Must be 78 GB or larger. ● Must be 20 GB or larger.

Description

Writes the metadata to the specified meta-volume, and activates it. The specified meta-volume must already exist (it is not created automatically).

This command fails if the destination meta volume has a lower number of meta data slots than required to support the current configuration. This is highly likely if the target meta-volume was manually created before Release 5.1 and has 32000 slots. Confirm this by using the ll command in the system volume context. See the troubleshooting procedures for metro node in the SolVe Desktop for information on fixing this problem.

See also

- `meta-volume create`
- `meta-volume destroy`

meta-volume verify-on-disk-consistency

Analyzes a meta-volume's committed (on-disk) header slots for consistency across all mirrors/components.

Contexts

All contexts.

Syntax

```
meta-volume verify-on-disk-consistency
```
[-l|--log] *log-file*

[-f|--first] *first*

[-n|--number] *number*

[-c|--cluster] *cluster*

[-m|--meta-volume] *meta-volume*

--style {short|long|slow}

Arguments

Required arguments	
[-c|--cluster] cluster	The cluster at which to analyze the active meta-volume. This argument may be omitted if the `--meta-volume` argument is present.
[-m|--meta-volume] meta-volume	The meta-volume to analyze. This argument may be omitted if the `--cluster` argument is present.
[-l|--log] log file	Full path to the log file on the management server.
[-f|--first] first	Offset of first header to analyze.
[-n|--number] number	Number of headers to analyze.
--style {short|long|slow}	The style of analysis to do. Valid values: `short` - Requires special firmware support available only in Release 5.0 and later. `long` - Requires special firmware support available only in Release 5.0 and later. `slow` - Available for all Release versions. Downloads the meta-volume headers from the meta-volume legs one at a time and compares them. ⚠ **CAUTION: The `slow` option may take hours to complete on a production meta-volume.**

Description

An active meta-volume with an inconsistent on-disk state can lead to a data unavailability (DU) during NDU.

Best practice is to upgrade immediately after passing this meta-volume consistency check.

(i) **NOTE:** If any errors are reported, do not proceed with the upgrade, and contact Dell EMC Customer Support.

The format of the command is:

```
meta-volume verify-on-disk-consistency -style long --meta-volume meta-volume-name>
```

The command takes 10-20 minutes to complete.

Check the report in the log file saved at: `/tmp/logfilename`. The log file reports mismatches between meta-volume RAID 1 legs.

If mismatches are detected, run the command again using the format:

```
meta-volume verify-on-disk-consistency -style slow --meta-volume meta-volume-name>
```

This version of the command takes an hour to complete.

(i) **NOTE:** Running this command is recommended before upgrading from Release 5.0 or later.

Example

Verify the specified meta-volume is consistent using the slow style:

```
VPlexcli:/> meta-volume verify-on-disk-consistency --style slow --meta-volume
meta_cluster1
Doing a slow consistency check on meta-volume '/clusters/cluster-1/system-volumes/
meta_cluster1' for slots [0,32000).
Scanning offsets [0,32000)
..............................................................................................
..............................
..............................................................................................
..............................
.........................................................................
0 mismatches detected
```

Discover/display inconsistencies on a meta-volume using the long style:

```
VPlexcli:/clusters/cluster-2/system-volumes> meta-volume verify-on-disk-consistency -
c cluster-2 --style long
Doing a long consistency check on meta-volume '/clusters/cluster-2/system-volumes/
Cluster2_Meta_DGC_Vmax_mirror' for slots [0,32000).
Meta-volume is not consistent.
See /tmp/validatemeta.log for details of the inconsistencies.
```

See also

* `meta-volume create`

monitor add-console-sink

Adds a console sink to the specified performance monitor.

Contexts

All contexts.

In context, command is `add-console-sink.`

Syntax

```
monitor add-console-sink
[-o|--format] {csv|table}
[-m|--monitor] monitor-name
[--force]
```

Arguments

Required arguments	
[-m|--monitor] **context-path**	* Performance monitor to which to add a console sink.
Optional arguments	
[-f|--force]	Forces the creation of the sink, even if existing monitors are delayed in their polling.
[-o|--format] {csv|table}	The output format. Can be csv (comma-separated values) or table. Default: table.

* -argument is positional.

Description

Creates a console sink for the specified performance monitor. Console sinks send output to the management server console.

Every monitor must have at least one sink, and may have multiple sinks. A monitor does not begin operation (polling and collecting performance data) until a sink is added to the monitor.

Use the monitor `add-console-sink` command to add a console sink to an existing monitor.

⚠ **CAUTION: Console monitors display the specified statistics on Unisphere for metro node, interrupting any other input/output to/from the console.**

Example

Add a console sink with output formatted as table (the default output format for console sinks):

```
VPlexcli:/> monitor add-console-sink --monitor Director-2-1-B_TestMonitor
```

Navigate to the monitor context and use the ll console command to display the sink settings:

```
VPlexcli:> /cd /monitoring/directors/Director-2-1-B/monitors/Director-2-1-B_TestMonitor/
sinks
VPlexcli:/monitoring/directors/Director-2-1-B/monitors/Director-2-1-B_TestMonitor/sinks>
ll
Name      Enabled  Format  Sink-To
```

```
-------   -------   ------   -------
console   true      table    console
VPlexcli:/monitoring/directors/Director-2-1-B/monitors/Director-2-1-B_TestMonitor/sinks>
ll console
/monitoring/directors/Director-2-1-B/monitors/Director-2-1-B_TestMonitor/sinks/console:
Name      Value
-------   -------
enabled   true
format    table
sink-to   console
type      console
```

See also

- `monitor add-file-sink`
- `monitor remove-sink`
- monitor create

monitor add-file-sink

Adds a file sink to the specified performance monitor.

Contexts

All contexts.

In `/monitoring` context, command is `add-file-sink`.

Syntax

```
monitor add-file-sink
[-n|--name] name
[-o|--format] {csv|table}
[-m|--monitor] monitor-name
[-f|--file] filename
```

-- force

Arguments

Required arguments	
`[-m|--monitor]` *context-path*	* Performance monitor to which to add a console sink.
`[-f|--file]` *filename*	* File to which to send the sink's data.
Optional arguments	
`[-f|--force]`	Forces the creation of the sink, even if existing monitors are delayed in their polling.
`[-n|--name]` *name*	Name for the new sink. If no name is provided, the default name "file" is applied.
`[-o|--format] {csv|table}`	The output format. Can be csv (comma-separated values)' or table. Default: csv.

* -argument is positional.

Description

Creates a file sink for the specified monitor. File sinks send output to the specified file.

The default location of the output file is `/var/log/VPlex/cli`.

The default name for the file sink context is `file`.

Every monitor must have at least one sink, and may have multiple sinks. A monitor does not begin operation (polling and collecting performance data) until a sink is added to the monitor

Use the `monitor add-file-sink` command to add a file sink to an existing monitor.

Example

To add a file sink to send output to the specified .csv file:

```
VPlexcli:/monitoring/directors/director-1-1-A/monitors> monitor add-file-sink  --monitor
director-1-1-A_stats --file /var/log/VPlex/cli/director_1_1_A.csv
```

Navigate to the monitor sinks context and use the ll sink-name command to display the sink:

```
VPlexcli:>/cd /monitoring/directors/director-1-1-A/monitors/director-1-1-A_stats/sinks
VPlexcli:/monitoring/directors/Director-1-1-A/monitors/director-1-1-A_stats/sinks> ll
file
/monitoring/directors/Director-1-1-A/monitors/director-1-1-A_stats/sinks/file:
Name      Value
-------   ----------------------------
enabled   true
format    csv
sink-to   /var/log/VPlex/cli/director_1_1_A.csv
type      file
```

See also

- `monitor add-console-sink`
- `monitor collect`
- `monitor remove-sink`
- `report create-monitors`

monitor collect

Force an immediate poll and collection of performance data without waiting for the automatic poll interval.

Contexts

All contexts.

In `/monitoring` context, command is `collect`.

Syntax

```
monitor collect
```

`[-m|--monitors]` *context-path,context-path...*

Arguments

Required arguments	
`[-m|--monitor]` *context-path,context-path*	One or more performance monitors to update immediately.

Description

Polls and collects performance data from user-defined monitors. Monitors must have at least one enabled sink.

Example

```
VPlexcli:/> monitor collect /monitoring/directors/director-2-1-B/monitors/director-2-1-
B_TestMonitor
VPlexcli:/>
Source:                              director-2-1-B_TestMonitor
Time:                                2010-07-01 10:05:55
director.be-ops (counts/s):
.
.
.
```

See also

- `monitor create`
- `report poll-monitors`

monitor create

Creates a performance monitor.

Contexts

All contexts.

In `/monitoring` context, command is `create`.

Syntax

```
monitor create
```

`[-p|--period]` *collection-period*

`[-n|--name]` *monitor-name*

`[-d|--director]` *context-path,context-path...*

`[-s|--stats]` *stat,[stat,...]*

`[-t|--targets]` *context-path,context-path...*

`[-f|--force]`

Arguments

Required arguments	
`[-n|--name]` *monitor-name*	* Name of the monitor. The name is appended to the director on which the monitor is configured.
`[-s|--stats]` *stat*[,*stat*,...]	* One or more statistics to monitor, separated by commas. Use the monitor stat-list command to display the available statistics.
Optional arguments	
`[-p|--period]` *collection-period*	Frequency at which this monitor collects statistics. Valid arguments are an integer followed by: `ms` - milliseconds (period is truncated to the nearest second) `s` - seconds (Default) `min` - minutes `h` - hours `0` - Disables automatic polling. The default period is 30 seconds.
`[-d|--director]` *context-path*, *context-path*...	* List of one or more comma-separated directors for which to display statistics.
`[-t|--targets]` *context-path*, *context-path*...	List of one or more comma-separated targets for which to display statistics. Applicable only to statistics that require a target.
`[-f|--force]`	Forces the creation of the monitor, even if existing monitors are delayed in their polling.

* - argument is positional.

Description

Performance monitoring collects and displays statistics to determine how a port or volume is being used, how much I/O is being processed, CPU usage, and so on.

Metro node collects and displays performance statistics using two user-defined objects:

● monitors - Gather the specified statistics.
● monitor sinks - Direct the output to the desired destination. Monitor sinks include the console, a file, or a combination of the two.

The monitor defines the automatic polling period, the statistics to be collected, and the output of the format. The monitor sinks define the output destination.

Polling occurs when:

● The timer defined by the monitor's period attribute has expired.
● The monitor has at least one sink with the enabled attribute set to true.

Polling is suspended when:

● The monitor's period is set to 0, and/or
● All the monitor's sinks are either removed or their enabled attribute is set to false

Create short-term monitors to diagnose an immediate problem.

Create longer-term monitors for ongoing system management.

About file rotation and timestamps

The log files created by a monitor's file sink are automatically rotated when they reach a size of 10 MB. The 10MB file is saved as `filename.csv.`*n* where *n* is a number 1 - 10, and output is saved in a new file named `filename.csv.`*n*+1.

The `.csv` files are rotated up to 10 times.

In the following example, a monitor has exceeded 10MB of output. The initial 10MB are stored in `filename.csv.1`. Subsequent output is stored in `filename.csv`.

```
service@sms-cluster-1:/var/log/VPlex/cli> ll my-data.csv*
-rw-r--r-- 1 service users 2910722 2012-03-06 21:23 my-data.csv
-rw-r--r-- 1 service users 10566670 2012-03-06 21:10 my-data.csv.1
```

If the second file exceeds, 10B, it is saved as `filename.csv.2`, and subsequent output is saved in `filename.csv`. Up to 10 such rotations, and numbered `.csv` files are supported.

When the file sink is removed or the monitor is destroyed, output to the `.csv` file stops, and the current `.csv` file is time stamped. For example:

```
service@sms-cluster-1:/var/log/VPlex/cli> ll my-data.csv*
-rw-r--r-- 1 service users 10566670 2012-03-06 21:23 my-data.csv.1
-rw-r--r-- 1 service users  5637498 2012-03-06 21:26 my-data.csv_20120306092614973
```

Examples

Create a simple monitor with the default period, and no targets:

```
VPlexcli:/monitoring> monitor create --name TestMonitor --director Director-2-1-B --stats director.fe-read,director.fe-write
Successfully created 1 monitor(s) out of 1.
```

To create a monitor to collect statistics from the director category on /engines/engine1/directors/Director-2-1-B every 10 seconds:

```
VPlexcli:/monitoring> monitor create --name DirStats --period 10s --director/clusters/cluster-1/directors/Director-2-1-B --stats director.*
```

Create a monitor to collect statistics on all storage volumes at cluster-1:

```
VPlexcli:/monitoring> monitor create --name SVStats-Cluster1 --director /clusters/cluster-1/directors/Director-2-1-B --stats storage-volume.* --targets /clusters/cluster-1/storage-elements/storage-volumes/*
```

Create a performance monitor to collect statistics on front-end port FE-ETH06:

```
VPlexcli:/monitoring> monitor create --name FE-ETH06-stats --director /clusters/cluster-1/directors/director-1-1-A --stats fe-prt.* --targets clusters/cluster-1/directors/director-1-1-A/hardware/ports/ETH06
```

See also

- `monitor add-console-sink`
- `monitor-add-file-sink`
- `monitor destroy`
- `monitor stat-list`
- `report create-monitors`

monitor destroy

Destroys a performance monitor.

Contexts

All contexts.

In `/monitoring` context, command is `destroy`.

Syntax

```
monitor destroy
```

[-m|--monitor] *monitor-name,monitor-name...*

[-c|--context-only]

[-f|--force]

Arguments

Required arguments	
[-m|--monitor] *monitor-name*	* List of one or more names of the monitors to destroy.
Optional arguments	
[-f|-- force]	Destroy monitors with enabled sinks and bypass confirmation.
[-c|--context-only]	Removes monitor contexts from Unisphere for metro node and the CLI, but does not delete monitors from the firmware. Use this argument to remove contexts that were created on directors to which the element manager is no longer connected.

* Argument is positional

Description

Deletes the specified performance monitor.

Example

```
VPlexcli:/> monitor destroy Cluster_2_Dir_2B_diskReportMonitor,
Cluster_2_Dir_2B_portReportMonitor,Cluster_2_Dir_2B_volumeReportMonitor
WARNING: The following items will be destroyed:
Context
--------------------------------------------------------------------------------
/monitoring/directors/Cluster_2_Dir_2B/monitors/Cluster_2_Dir_2B_diskReportMonitor
/monitoring/directors/Cluster_2_Dir_2B/monitors/Cluster_2_Dir_2B_portReportMonitor
/monitoring/directors/Cluster_2_Dir_2B/monitors/Cluster_2_Dir_2B_volumeReportMonitor
Do you wish to proceed? (Yes/No) y
Monitor 'Cluster_2_Dir_2B_volumeReportMonitor' is owned by another management console
and/or has enabled sinks.  Do you wish to proceed ? (Yes/No) y
Monitor 'Cluster_2_Dir_2B_portReportMonitor' is owned by another management console
and/or has enabled sinks.  Do you wish to proceed ? (Yes/No) y
Monitor 'Cluster_2_Dir_2B_diskReportMonitor' is owned by another management console
and/or has enabled sinks.  Do you wish to proceed ? (Yes/No) y
```

See also

- `monitor create`
- `report create-monitors`

monitor get-stats

Get last stats from monitors

Contexts

All

Syntax

`get-stats`

`[m | --monitors=` *context paths [, context paths>...]]*

`-p | --parseable`

`-h | --help`

`--verbose`

Arguments

Required arguments	
`-m	--monitors=` *context paths [, context paths ...]*	* Get the last stats from the monitors specified by the listed context paths.
`-p	--parseable`	Output parser-friendly stats names
Optional arguments	
`-h	--help`	Displays the usage for this command.
`--verbose`	Provides more output during command execution. This may not have any effect for some commands.

* argument is positional

Description

Get last stats from monitors

The default polling frequency of System Wide perpetual monitors is 5 seconds and Virtual Volume perpetual monitors is 1 minute. So your application should tune the poll frequency (calling the REST API to get the stats from metro node) according to the poll frequency of the monitors. If your application is polling at a higher frequency than the monitor, your application will get redundant data or data that it has already polled.

Examples

```
monitor get-stat –monitors director-1-1-A_PERPETUAL_vplex_sys_perf_mon_v19,director-1-1-
B_PERPETUAL_vplex_sys_perf_mon_v19
```

```
monitor get-stat –monitors director-1-1-A_VIRTUAL_VOLUMES_PERPETUAL_MONITOR,director-1-1-
B_VIRTUAL_VOLUMES_PERPETUAL_MONITOR
```

monitor remove-sink

Removes a sink from a performance monitor.

Contexts

All contexts.

In `/monitoring` context, command is `remove-sink.`

Syntax

```
monitor remove-sink
```

`[-s|--sinks]` *context-path,context-path...*

Arguments

Required arguments	
`[-s|--sinks]` *context-path,context-path...*	* List of one or more sinks to remove. Entries must be separated by commas.

* - argument is positional.

Description

Removes one or more performance monitor sinks.

Example

Remove a console sink:

```
VPlexcli:/monitoring/directors/director-2-1-B/monitors/director-2-1-B _TestMonitor>
monitor remove-sink console
```

See also

- `monitor add-console-sink`
- `monitor add-file-sink`

monitor stat-list

Displays statistics available for performance monitoring.

Contexts

All contexts.

In `/monitoring` context, command is `stat-list`.

Syntax

```
monitor stat-list
```

`[-c|--categories]` *category*,*category*...

Arguments

Optional arguments	
`[-c|--categories]` *category*, *category*...	List of one or more statistics categories to display.

Description

Performance statistics are grouped into categories Use the `monitor stat-list` command followed by the <Tab> key to display the statistics categories.

Use the `--categories` *categories* argument to display the statistics available in the specified category.

Use the * wildcard to display all statistics for all categories.

(i) **NOTE:** A complete list of the command output is available in the *Dell EMC Administration Guide for metro node.*

Examples

```
VPlexcli:/> monitor stat-list --categories
cache            ip-com-port      rp-spl-node      fc-com-port
wrt-pacing       rp-spl-vol       fe-director      director
fe-lu            be-prt           ramf             virtual-volume
com-cluster-io   directory        fe-prt           cg
storage-volume
OR
Use TAB key after the command
VPlexcli:/> monitor stat-list
cache            ip-com-port      rp-spl-node      fc-com-port
wrt-pacing       rp-spl-vol       fe-director      director
fe-lu            be-prt           ramf             virtual-volume
com-cluster-io   directory        fe-prt           cg
storage-volume
```

See also

- `monitor create`
- *Dell EMC Administration Guide for metro node.*

ndu pre-check

Performs a pre-NDU validation and check.

Contexts

All contexts.

Syntax

`ndu pre-check`

Description

The `ndu pre-check` command should be run before you run a non-disruptive upgrade on a system to upgrade GeoSynchrony. This command runs through a number of checks to see if the non-disruptive upgrade would run into any errors in upgrading GeoSynchrony.

⚠ **CAUTION: NDU pre-checks must be run within 24 hours before starting the NDU process.**

Disclaimers for multipathing in `ndu pre-check` give time for you to validate hosts.

The checks performed by `ndu pre-check` are listed in the Upgrade procedure for each software release. This procedure can be found in the metro node procedures in the SolVe Desktop.

See also

- `ndu start`
- `ndu recover`
- `ndu status`

ndu pre-config-upgrade

Disruptively upgrades a metro node that has not been fully installed and configured.

Contexts

All contexts.

Syntax

`ndu pre-config-upgrade`

`[-u|--firmware]` *firmware-tar-file*

`[-i|--image]` *firmware-image-file*

Arguments

Optional arguments	

[-u|--firmware] *firmware-tar-file*	- Full path to director firmware package on the management server.
[-i|--image] *firmware-image-file*	- Full path to director firmware image on the management server.

Description

Disruptively upgrades a metro node when the metro node is not fully installed and configured.

⚠ **CAUTION: This command requires the metro node be in a pre-config state. Specifically, do not use this procedure unless NO meta-volume is configured (or discoverable).**

See also

- `ndu start`
- `ndu recover`
- `ndu status`

ndu recover

Perform NDU recovery after a failed NDU attempt.

Contexts

All contexts.

Syntax

```
ndu recover
```

Description

If the NDU failed before I/O is transferred from the second upgraders (running old software) to the first upgraders (running new software), then the first upgraders are rolled back to the old software.

If the NDU failed after I/O transfer, the directors are rolled forward to the new software.

If no recovery is needed, a message is displayed.

It is safe to run the `ndu recover` command multiple times.

See the upgrade procedure or the troubleshooting procedure in the SolVe Desktop for details of the `ndu recover` command and its use.

See also

- `ndu pre-check`
- `ndu start`
- `ndu status`

ndu start

Begins the non-disruptive upgrade (NDU) process of the director firmware.

Contexts

All contexts.

Syntax

ndu start

[--io-fwd-ask-for-confirmation] *prompt type* [-u|--firmware] *firmware-tar-file* [*optional-argument* [*optional-argument*]]

Arguments

Required arguments	
[-u|--firmware] *firmware-tar-file*	* Full path to director firmware package on the management server.

[--io-fwd-ask-for-confirmation] *prompt type*	The type of the prompt that you want to see during the IO forwarding phase of the NDU. The available options are:
	● always - Choose this option if you have hosts that require manual scanning for the paths to be visible. Assistance from the customer is required to verify that initiator paths on the hosts are alive. If the path is unavailable, resolve the issue within the timeout period that you have specified. The prompts for this options are:
	  ○ Continue: NDU continues even when there are missing initiator logins. Make sure that the customer is aware that missing logins can cause DU.
	  ○ Rollback: NDU rolls back and DU is avoided. The customer can check the host, resolve the issue that led to the missing initiator logins, and rerun the NDU.
	  ○ Refresh: Get the new list of initiators. If all the initiators are logged in, metro node displays the prompts to move forward.
	● on-missing-logins - Assistance from the customer is required to determine whether any missing initiators are from critical hosts. If paths are unavailable from critical hosts, the customer will need to resolve the issue before continuing with the NDU. The prompts for this options are:
	  ○ Continue: NDU continues even when there are missing initiator logins. Make sure that the customer is aware that missing logins can cause DU.
	  ○ Rollback: NDU rolls back and DU is avoided. The customer can check the host, resolve the issue that led to the missing initiator logins, and rerun the NDU.
	  ○ Refresh: Get the new list of initiators. After all the initiators are logged in, NDU continues without displaying any prompt.
	● never - No interaction is required or the customer is not available to check the host connectivity. NDU waits for all the initiators to log back in within the specified timeout period. Resolve any issues within this period. If metro node identifies any missing logins after the timeout period, NDU is rolled back. It is important to check whether this value must be modified according to the environment requirements of the customers and weighed against the risks.

Optional arguments	
--io-fwd-timeout= *time*	The period after which the I/O forward phase times out. In the I/O forward phase, the I/Os that are serviced to the first set of directors are forwarded to the second set of directors. The hosts are expected to connect back to the first set of directors during this period. By default, this phase lasts for 180 minutes. You can set this timeout period to a minimum of 6 minutes and a maximum of 12 hours. Use:

	- `s` for seconds - `m` for minutes - `h` for hours - `d` for days
`--cws-package cws-firmware-tar-file`	Full path to Cluster Witness Server package on the management server. ⓘ **NOTE:** Not required if upgrading to an official product release.
`--force`	Ignore manifest checking of supported upgrades.
`--skip-cws-upgrade`	Skips the upgrade of the Cluster Witness Server and proceeds with the rest of the NDU.
`--skip-be-switch-check`	Skips the NDU pre-check for unhealthy back-end switches.
`--skip-cluster-status-check`	Skips the NDU pre-check for cluster problems (missing directors, suspended exports, inter-cluster link failure, and so on).
`--skip-confirmations`	Skips any user confirmations normally required before proceeding when there are NDU pre-check warnings.
`--skip-distributed-device-settings-check`	Skips the NDU pre-check for distributed device settings (auto-resume set to true).
`--skip-fe-switch-check`	Skips the NDU pre-check for unhealthy front-end switches.
`--skip-group-be-checks`	Skips all NDU pre-checks related to back-end validation. This includes pre-checks for system configuration validation and unreachable storage volumes.
`--skip-group-config-checks`	Skips all NDU pre-checks related to system configuration. This includes the system configuration validation and director commission pre-checks.
`--skip-group-fe-checks`	Skips all NDU pre-checks related to front-end validation. This includes the unhealthy storage views and storage view configuration pre-checks.
`--skip-group-health-checks`	Skips all NDU pre-checks related to system health validation. This includes the system configuration validation, unhealthy virtual volumes, cluster status, and the inter-cluster communications connectivity pre-checks.
`--skip-meta-volume-backup-check`	Skips the check to verify that backups for the meta-data volumes at all clusters have been configured.
`--skip-meta-volume-redundancy-check`	Skips the NDU pre-check for verifying the meta-volume redundancy.
`----skip-storage-volumes-check`	Skip the NDU pre-check for unreachable storage volumes.
`--skip-sysconfig-check`	Skips the system configuration validation NDU pre-check and proceed with NDU even if there are errors with cache replication, logging volume setup, back-end connectivity, and metadata volume health.
`--skip-view-config-check`	Skips the NDU pre-check for storage view configuration (front-end high availability). This option is required to pass the NDU pre-checks when operating a minimum configuration. For minimum configurations, front-end high-availability pre-checks must be performed manually.
`--skip-view-health-check`	Skips the NDU pre-check for unhealthy storage views.
`--skip-virtual-volumes-check`	Skips the NDU pre-check for unhealthy virtual volumes.
`--skip-wan-com-check`	Skips the inter-cluster communications connectivity NDU pre-check and proceed with NDU even if there are errors specifically related to inter-cluster communications connectivity.
`--skip-local-com-check`	Skips the intra-cluster communications connectivity NDU pre-check and proceed with NDU even if there are errors specifically related to intra-cluster communications.

`--skip-total-number-of-volumes-check`	Skips the NDU pre-check for total number of volumes.
`--skip-inter-director-mgmt-connectivity-check`	Skips the NDU pre-check for inter-director management connectivity.
`--do-not-verify-wanlink-after-upgrade`	NDU does not check whether first-upgraders see each other on the WAN link after the upgrade.
`--skip-storage-view-missing-lun0-check`	Skips the NDU pre-check for storage-views with virtual-volumes that do not have a LUN0 ID.
`skip-hypervisor-rolling-upgrade-check`	Skips the hypervisor rolling upgrade check.

Description

This command starts a non-disruptive upgrade and can skip certain checks to push a non-disruptive upgrade when the `ndu pre-checks` command fails. The pre-checks executed by the `ndu pre-check` command verify that the upgrade from the current software to the new software is supported, the configuration supports NDU, and the system state is ready (clusters and volumes are healthy).

You must resolve all issues disclosed by the `ndu pre-check` command before running the `ndu start` command.

Skip options enable `ndu start` to skip one or more NDU pre-checks. Skip options should be used only after fully understanding the problem reported by the pre-check to minimize the risk of data unavailability.

ⓘ **NOTE:** Skip options may be combined to skip more than one pre-check. Multiple skip options must be separated by a space.

ⓘ **NOTE:** It is recommended that you upgrade metro node using the upgrade procedure found in the SolVe Desktop. This procedure also details when the `ndu start` command should be used with skip options and how to select and use those skip options.

See also

- `ndu pre-check`
- `ndu recover`
- `ndu status`

ndu status

Displays the NDU status.

Contexts

All contexts.

Syntax

```
ndu status
[--verbose]
```

Description

If an NDU firmware or OS upgrade is running, this command displays the upgrade activity.

If neither NDU firmware or OS upgrade is running, this command displays information about the previous NDU firmware upgrade.

If the last operation was a rolling-upgrade, the OS upgrade information is displayed. The `ndu start` command clears this information.

If an NDU firmware or OS upgrade has failed, this command displays a message to use the `ndu recover` command.

if an NDU recovery is in progress, has succeeded or failed, this command displays a status message.

Examples

Display a successful NDU after completion:

```
VPlexcli:/> ndu status
Gathering NDU status...
No firmware or OS upgrade in progress.
Last Firmware Upgrade attempt on Fri, 17 Dec 2010 01:07:51
    From version 2.1.17.0.0 to version 2.1.19.0.0
    Was started on management server 10.6.209.61
    Result: succeeded
==============================================================================
[Fri Dec 17 18:05:21 2010] System state summary
==============================================================================
  The directors {director-1-1-B, director-1-1-A, director-1-2-B, director-1-2-A} are
operational at version 2.1.19.0.0.
==============================================================================
The output for 'ndu status' has been captured in /var/log/VPlex/cli/capture/ndu-status-
session.txt
```

Display NDU status after an NDU failed and `ndu recover` was run:

```
VPlexcli:/> ndu status
Gathering NDU status...
No firmware or OS upgrade in progress.
Last Firmware Upgrade attempt on Fri, 17 Dec 2010 00:39:29
    From version 2.1.19.0.0 to version None
    Was started on management server 10.6.209.61
    Result: failed
    Reason: Encountered a problem while preparing to start the NDU.
Unable to extract director package files, return code 2.
NDU recover succeeded on management server 127.0.0.1 on Fri, 17 Dec 2010 01:00:27.
==============================================================================
[Fri Dec 17 01:05:25 2010] System state summary
==============================================================================
  The directors {director-1-1-B, director-1-1-A, director-1-2-B, director-1-2-A} are
operational at version 2.1.19.0.0.
==============================================================================
The output for 'ndu status' has been captured in /var/log/VPlex/cli/capture/ndu-status-
session.txt
```

See also

- ndu pre-check
- ndu start
- ndu recover
- upgrade-package

plugin addurl

Adds an URL to the plug-in search path.

Contexts

All contexts.

Syntax

```
plugin addurl
[-u|--urls] url,url...
```

Arguments

Required arguments	
`[-u|--urls]` *url*, *url*...	A list of URLs to add to the search path. Entries must be separated by commas.

Description

ⓘ **NOTE:** The plugin commands are not intended for customer use.

Plug-ins extend the class path of the CLI. Plug-ins support dynamic addition of functionality. The plugin search path is used by the plugin register command.

See also

- `plugin listurl`
- `plugin register`

plugin listurl

Lists URLs currently in the plugin search path.

Contexts

All contexts.

Syntax

```
plugin listurl
```

Description

The search path URLs are those locations added to the plugin search path using the `plugin addurl` command.

ⓘ **NOTE:** The plugin commands are not intended for customer use.

Example

```
VPlexcli:/> plugin listurl
file:/opt/emc/VPlex/jython2.2/LibExt/AutoBundles/prodscripts.jar, file:/opt/emc/VPlex/
apache-tomcat-6.0.x/bin/commons-daemon.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/bin/
bootstrap.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/bin/tomcat-juli.jar,
file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/tomcat-i18n-es.jar, file:/opt/emc/
VPlex/apache-tomcat-6.0.x/lib/tomcat-juli-adapters.jar, file:/opt/emc/VPlex/apache-
tomcat-6.0.x/lib/catalina-tribes.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/
servlet-api.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/tomcat-coyote.jar,
file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/realm-adapter.jar, file:/opt/emc/VPlex/
apache-tomcat-6.0.x/lib/catalina-ha.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/
jasper-jdt.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/catalina.jar,
file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/catalina-ant.jar, file:/opt/emc/VPlex/apache-
tomcat-6.0.x/lib/jsp-api.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/annotations-
api.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/jasper-el.jar, file:/opt/emc/VPlex/
apache-tomcat-6.0.x/lib/jasper.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/tomcat-
i18n-ja.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/el-api.jar, file:/opt/emc/VPlex/
apache-tomcat-6.0.x/lib/tomcat-i18n-fr.jar, file:/opt/emc/VPlex/apache-tomcat-6.0.x/lib/
tomcat-dbcp.jar
```

See also

- `plugin addurl`
- `plugin register`

plugin register

Registers a shell plugin by class name.

Contexts

All contexts.

Syntax

```
plugin register
[-c|--classes] class-name[,class-name ...]
```

Arguments

Required arguments	
[-c|--classes] *class-name*[, *class-name*...]	A list of plugin classes. Entries must be separated by commas.

Description

Plugin class is found in the default classpath, or in locations added using the `plugin addurl` command.

Plug-ins add a batch of commands to the CLI, generally implemented as a set of one or more Jython modules.

(i) **NOTE:** The plugin commands are not intended for customer use.

See also

- `plugin addurl`
- `plugin listurl`

popd

Pops the top context off the stack, and changes the current context to that context.

Contexts

All contexts.

Syntax

popd

Description

If the context stack is currently empty, an error message is displayed.

Example

In the following example:

- The `pushd` command adds a third context to the context stack. The output of the command displays the three contexts in the stack.
- The `popd` command removes the top (last added) context, changes the context to the next one in the stack, and the output displays the two remaining contexts:

```
VPlexcli:/clusters/cluster-1/directors/diector-1-1-A> pushd /clusters/cluster-1/
directors/director-1-1-B
[/clusters/cluster-1/directors/director-1-1-B, /clusters/cluster-1/directors/
director-1-1-A, /clusters/cluster-1/storage-elements/storage-arrays, /, /]
VPlexcli:/clusters/cluster-1/directors/director-1-1-B> popd
[/clusters/cluster-1/directors/director-1-1-B, /clusters/cluster-1/storage-elements/
storage-arrays, /, /]
VPlexcli:/clusters/cluster-1/directors/director-1-1-A>
```

See also

- `pushd`

pushd

Pushes the current context onto the context stack, and then changes the current context to the given context.

Contexts

All contexts.

Syntax

```
pushd
[-c|--context] context
```

Arguments

Optional arguments	
`[-c|--context]` *context*	The context to push onto the context stack.

Description

Adds the context to the context stack.

If no context is supplied, and there is a context on the stack, the current context is exchanged with the top-of-stack context.

Use the `popd` command to remove the topmost context from the context stack.

Example

Starting in the root context, use the `pushd` command to push the first context onto the context stack:

```
VPlexcli:/>
VPlexcli:/> pushd /clusters/cluster-1/storage-elements/storage-arrays/
[/clusters/cluster-1/storage-elements/storage-arrays, /, /]
```

Use the `pushd` command to push a second context onto the context stack:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-arrays> pushd /clusters/cluster-1/
directors/director-1-1-A/
[/clusters/cluster-1/directors/director-1-1-A, /clusters/cluster-1/storage-elements/
storage-arrays, /, /]
```

Now, there are two contexts on the context stack. Use the `pushd` command to toggle between the two contexts:

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A> pushd
[/clusters/cluster-1/storage-elements/storage-arrays, /clusters/cluster-1/directors/
director-1-1-A, /, /]
VPlexcli:/clusters/cluster-1/storage-elements/storage-arrays> pushd
[/clusters/cluster-1/directors/director-1-1-A, /clusters/cluster-1/storage-elements/
storage-arrays, /, /]
VPlexcli:/clusters/cluster-1/directors/director-1-1-A>
```

See also

- `popd`

rebuild set-transfer-size

Changes the transfer-size of the given devices.

Contexts

All contexts.

Syntax

```
rebuild set-transfer-size
```

[-r|--devices] *context-path,context-path...*
[-l|--limit] *limit*

Arguments

Required arguments	
[-r|-devices] *context-path*	* List of one or more devices for which to change the transfer size. Wildcards are permitted. Entries must be separated by commas.
[-l|--limit] *limit*	* Transfer size in bytes. Maximum number of bytes to transfer as one operation per device. Specifies the size of read sector designated for transfer in cache. Setting this value smaller implies more host I/O outside the transfer boundaries. Setting the value larger may result in faster transfers. Valid values must be multiples of 4K. Range: 40K-128M. See About transfer-size in the batch-migrate start command.

* - argument is positional.

Description

If the target devices are rebuilding when this command is issued, the rebuild is paused and resumed using the new transfer-size.

ⓘ **NOTE:** If there are queued rebuilds, the rebuild may not resume immediately.

Example

Set the transfer-size on a specified device to 1M:

```
VPlexcli:/> rebuild set-transfer-size --devices /clusters/cluster-1/devices/testdevice --
limit 1M
```

Set the transfer-size for all devices to 2M:

```
VPlexcli:/> rebuild set-transfer-size /clusters/*/devices/* 2M
```

Set the transfer-size for all distributed devices to 10K:

```
VPlexcli:/distributed-storage/distributed-devices> rebuild set-transfer-size * 10k
```

See also

- rebuild show-transfer-size
- rebuild status

rebuild show-transfer-size

Shows the transfer-size of specified RAID 1 devices.

Contexts

All contexts.

Syntax

```
rebuild show-transfer-size
[-r|--devices] context-path
```

Arguments

Optional arguments	
`[-r|-devices]` context-path...	List of one or more RAID 1 devices for which to display the transfer size. Entries must be separated by commas. Wildcards are permitted.

Example

Display the rebuild transfer size for a specified device:

```
VPlexcli:/> rebuild show-transfer-size TestDevice
device name     transfer-size
------------    -------------
TestDevice      2M
```

Display rebuild transfer size for selected devices:

```
VPlexcli:/> rebuild show-transfer-size dd_0*
device name   transfer-size
----------    ------------
dd_00         2M
dd_01         2M
dd_02         2M
.
.
.
```

Display rebuild transfer size for all distributed devices:

```
VPlexcli:/> rebuild show-transfer-size *
device name     transfer-size
------------    -------------
TestDevice      2M
dd_00           2M
dd_01           2M
dd_02           2M
.
.
.
```

See also

- `rebuild set-transfer-size`

● `rebuild status`

rebuild status

Displays all global and cluster-local rebuilds along with their completion status.

Contexts

All contexts.

Syntax

```
rebuild status
[--show-storage-volumes]
```

Arguments

Optional arguments	
`--show-storage-volumes`	Displays all storage volumes that need to be rebuilt, both active and queued. If not present, only the active rebuilds are displayed.

Description

Completion status is listed as:

```
rebuilt/total (complete%)
```

Example

Check rebuild status from `storage-volume` context:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> rebuild status
[1] disks marked for rebuild
Global rebuilds:
No active global rebuilds.
cluster-1 local rebuilds:
device        rebuild type   rebuilder director   rebuilt/total   percent finished
throughput   ETA
-----------   -----------    -----------------    ------------    ----------------
---------    ----
test3313_r1   full           s10_428f                             1.23G/4G            30.81%
90.1M/s
```

Check rebuild status from `distributed-device-components/volume/components/` context, and display storage volumes that need to be rebuilt:

```
VPlexcli:/distributed-storage/distributed-devices/testvol1/distributed-device-components/
C2testvol0000/components> rebuild status --show-storage-volumes
StorageVolumes marked for rebuild:
cluster-2:
  extent_6006016063902800641 3c641e2a7e011_1
[1] storage_volumes marked for rebuild
Global rebuilds:
device    rebuild type   rebuilder director   rebuilt/total   percent finished   throughput
  ETA
--------  -----------    -----------------    -------------   ----------------   ----------
```

```
        ---------
testvol1  full        s1_220d_spa            4.06G/11.2G              36.17%      9.94M/s
    12.3min
Local rebuilds:
  No active local rebuilds.
```

See also

● `rebuild show-transfer-size`

report capacity-clusters

Generates a capacity report for every cluster.

Contexts

All contexts.

Syntax

`report capacity-clusters`

`[-d|--directory]` *directory*

`[--verbose]`

Arguments

Optional arguments	
`[-d|-directory]` *directory*	Directory in which to create the csv files. Output is written to a file named `CapacityClusters.csv`. Default directory path: `/var/log/VPlex/cli/reports/` on the management server.
`--verbose`	If the `--verbose` argument is used: ● Storage_volumes and volumes are listed before the summary is printed. ● Two additional files are created: `CapacityClustersVolumes.csv` and `CapacityClustersStorageVolumes.csv`.

Description

The capacity report information includes:

● Unclaimed storage-volume capacity in GB.
● Number of unclaimed storage volumes.
● Claimed storage-volume capacity in GB.
● Number of claimed storage volumes.
● Used storage-volume capacity in GB.
● Number of used storage volumes.
● Unexported virtual volume capacity in GB.
● Number of unexported virtual volumes.
● Exported virtual volume capacity in GB.
● Number of exported virtual volumes.

Examples

```
VPlexcli:/> report capacity-clusters
Cluster, Unclaimed disk capacity (GiB), Unclaimed storage_volumes, Claimed disk
capacity(GiB), Claimed storage_volumes, Used storage-volume capacity (GiB), Used
storage_volumes, Unexported volume capacity (GiB), Unexported volumes, Exported volume
capacity (GiB), Exported volumes
cluster-1, 5705.13, 341, 7947.68, 492, 360.04, 15, 3.00, 3, 2201.47, 27
cluster-2, 5337.10, 328, 7995.69, 495, 2478.45, 137, 20.00, 3, 2178.46, 25
VPlexcli:/> report capacity-clusters --verbose
Cluster, StorageVolume Name, VPD83 ID, Capacity, Use, Vendor
cluster-1,CX4_Logging,VPD83T3:6006016021d02500e6d58bab2227df11,80G,used,DGC
cluster-1,CX4__M0,VPD83T3:6006016021d02500be83caff0427df11,90G,-data,DGC
cluster-1,CX4__M1,VPD83T3:6006016021d02500bf83caff0427df11,90G,claimed,DGC
cluster-1,CX4_lun0,VPD83T3:6006016021d0250026b925ff60b5de11,10G,used,DGC
.
.
.
```

See also

- report capacity-arrays
- report capacity-hosts

report capacity-hosts

Generates a host capacity report.

Contexts

All contexts.

Syntax

report capacity-hosts

[-d|--directory] *directory*

[--verbose]

Arguments

Optional arguments	
[-d|-directory] *directory*	Directory in which to create the csv files. Output is written to a file named CapacityHosts.csv. Default directory path: /var/log/VPlex/cli/reports/ on the management server.
--verbose	If the --verbose argument is used, an additional file is created: CapacityHostsViews.csv.

Description

The host capacity information includes:

- Number of views.
- Total exported capacity in GB.

- Number of exported virtual volumes per cluster.

Example

Generate a host capacity report.

```
VPlexcli:/> report capacity-hosts
Cluster, Views, Exported capacity (GiB), Exported volumes
cluster-1, 2, 2209.47, 28
cluster-2, 1, 2178.46, 25
```

The --verbose argument prints view details:

```
VPlexcli:/> report capacity-hosts --verbose
Cluster, View name, Initiator ports, Target ports, Volumes, Capacity
cluster-1, LicoJ013, LicoJ013_hba3 LicoJ013_hba2 LicoJ013_hba1 LicoJ013_hba0,
P000000003CA00147-A1-FC00 P000000003CA00147-A1-FC02 P000000003CB00147-B0-FC02
P000000003CB00147-B1-FC00 P000000003CA00147-A0-FC00 P000000003CB00147-B0-FC00
P000000003CA00147-A0-FC02 P000000003CB00147-B1-FC02, dev_sym1723_1FC_vol, 8G
cluster-1, LicoJ009, LicoJ009_hba1 LicoJ009_hba0 LicoJ009_hba3 LicoJ009_hba2,
P000000003CA00147-A1-FC02 P000000003CB00147-B0-FC02 P000000003CA00147-A0-FC02
P000000003CB00147-B1-FC02, dd_09_vol dev_sym1723_1FC_vol TestDisDevice_vol dd_15_vol
dd_16_vol dd_20_vol dd_22_vol dd_18_vol dd_02_vol dd_12_vol dd_07_vol dd_19_vol
dd_14_vol dd_13_vol dd_04_vol dd_08_vol dd_11_vol dd_05_vol base0_vol dd_10_vol
dd_23_vol dd_01_vol dd_00_vol dd_17_vol dd_06_vol dd_03_vol dd_21_vol, 2.15T
cluster-2, LicoJ010, LicoJ010_hba1 LicoJ010_hba0 LicoJ010_hba3 LicoJ010_hba2,
P000000003CB000E6-B1-FC00 P000000003CB001CB-B0-FC00 P000000003CA001CB-A0-FC00
P000000003CA000E6-A0-FC00 P000000003CB001CB-B1-FC00 P000000003CB000E6-B0-FC00
P000000003CA001CB-A1-FC00 P000000003CA000E6-A1-FC00, base01_vol dd_09_vol dd_15_vol
dd_16_vol dd_20_vol dd_22_vol dd_18_vol dd_02_vol dd_12_vol dd_19_vol dd_07_vol
dd_14_vol dd_13_vol dd_04_vol dd_08_vol dd_11_vol dd_05_vol dd_10_vol dd_23_vol
dd_01_vol dd_00_vol dd_17_vol dd_06_vol dd_03_vol dd_21_vol, 2.13T
.
.
.
Cluster, Views, Exported capacity (GiB), Exported volumes
cluster-1, 2, 2209.47, 28
cluster-2, 1, 2178.46, 25
```

See also

- `report capacity-clusters`
- `report capacity-arrays`

rm

Deletes a file from the corresponding share location.

Contexts

This command can only be executed in the `in` or `out` sub-contexts within the `share` context of the management server
(either `/management-server/share/in` or `/management-server/share/out`.

Syntax

rm -n|--filename *filename* [-h | --help] [--verbose]

Arguments

Optional arguments	
`[-h|--help]`	Displays the usage for this command.
`[--verbose]`	Provides more output during command execution. This may not have any effect for some commands.

Description

The `rm` command is used to delete a file from an SCP directory.

As part of Role-based access implementation, users other than **service** are not allowed shell access and access by SCP is restricted to a single directory. The SCP directory, `/diag/share/` consists of two sub-directories `in` and `out` which contain only files that can be transferred by SCP to and from of the management-server respectively.

`mangement-server/share/in` and `mangement-server/share/out` are contexts corresponding to the `in` and `out` sub-directories of the SCP directory. Users without shell access use ls and rm commands to files transferred to and from the management server with SCP.

service and **admin** users are authorized to delete any existing file in the SCP sub-directories. Other users are only authorized to delete files to which they have access.

See also

- `user add`

schedule add

Schedules a job to run at the specified times.

Contexts

All contexts.

Syntax

```
schedule add
[-t|--time] time

[-c|--command] command
```

Arguments

Required arguments	
`[-t|--time]` *time*	* Date and time the job executes in crontab-style format enclosed in quote marks. Values are specified in the crontab-style format: "*Minute Hour Day-of-the-Month Month Day-of-the-week*" • Minute - 0-59. • Hour - 0-23. • Day of the Month - 1-31. • Month - 1-12, January = 1...December = 12 • Day of the week - 0-6, Sunday = 0...Saturday = 6

[-c|--command] *command*	* The CLI command to be executed at the specified time.

* - argument is positional.

Examples

To run the tree command every night at 1:00 a.m.:

```
VPlexcli:/> schedule add "0 1 * * *" --command tree
```

See also

- schedule list
- schedule modify
- schedule remove

schedule list

Lists all scheduled jobs.

Contexts

All contexts.

Syntax

```
schedule list
```

Examples

```
VPlexcli:/> schedule list
[0] 30 13 * * 3 syrcollect
[1] * 1 * * * tree
[2] * 2 * * * tree
```

See also

- schedule modify
- schedule remove

schedule modify

Modifies an existing scheduled job.

Contexts

All contexts.

Syntax

```
schedule modify
[-j|--job] job-ID

[-t|--time] time

[-c|--command] command
```

Arguments

Required arguments	
`[-j|--job]` job-ID	* ID of the scheduled job as displayed by the schedule list command.
`[-t|--time]` time	* Date and time the job executes in crontab-style format enclosed in quote marks. Values are specified in the following format:
	"*MinuteHourDay-of-the-Month MonthDay of -he-week*"
	Minute - 0-59.
	Hour - 0-23.
	Day of the Month - 1-31.
	Month - 1-12, January = 1...December = 12
	Day of the week - 0-6, Sunday = 0...Saturday = 6
`[-c|--command]` command	* The CLI command to be executed at the specified time.

* - argument is positional.

Examples

To modify a job with the ID of 3 so that it runs every day at 11:00 a.m. type:

```
VPlexcli:/> schedule list
[0] 30 13 * * 3 syrcollect
[1] * 1 * * * tree
[2] * 2 * * * tree
[3] * 3 * * * tree
VPlexcli:/> schedule modify 3 -t "0 11 * * *" -c tree
```

See also

- `schedule list`
- `schedule remove`

schedule remove

Removes a scheduled job.

Contexts

All contexts.

Syntax

```
schedule remove
[-j|--job] job-ID
```

Arguments

Required arguments	
[-j|--job] job-ID	* ID of the scheduled job as displayed by the schedule list command.

* - argument is positional.

Example

Remove job with the ID of 3:

```
VPlexcli:/> schedule list
[0] 30 13 * * 3 syrcollect
[1] * 1 * * * tree
[2] * 2 * * * tree
[3] * 3 * * * tree
VPlexcli:/> schedule remove 3
Removed scheduled job 3.
VPlexcli:/> schedule list
[0] 30 13 * * 3 syrcollect
[1] * 1 * * * tree
[2] * 2 * * * tree
```

See also

● schedule list
● schedule modify

scheduleSYR add

Schedules a weekly SYR data collection.

Contexts

All contexts.

Syntax

```
scheduleSYR add
[-d|--dayOfWeek] [0-6]
[-t|--hours] [0-23]
[-m|--minutes] [0-59]
```

Arguments

Required arguments	
`[-d|--dayOfWeek] [0-6]`	Day of the week run the collection. Valid values are 0-6, where Sunday = 0...Saturday = 6.
`[-t|--hours] [0-23]`	Hour at which to run the collection.
`[-m|--minutes] [0-59]`	Minute at which to run the collection.

Description

Typically, SYR collection and reporting are configured at initial system setup. Use this command to add a scheduled SYR collection time if none was configured.

SYR data collection can be scheduled to occur at most once a week. Attempts to add another weekly schedule results in an error.

SYR reporting gathers metro node configuration files and forward them to Dell EMC. SYR reports provide:

- Faster problem resolution and RCA
- Proactive maintenance
- Data for performance analysis

To modify the existing SYR collection time, use the `scheduleSYR` remove command to delete the current time, and the `scheduleSYR` add command to specify a new collection time.

Example

Schedule an SYR collection for every Wednesday at 12:30 p.m.:

```
VPlexcli:/> scheduleSYR add -d 3 -t 12 -m 30
SYR data collection job scheduled
VPlexcli:/> scheduleSYR list
SYR data collection job is currently scheduled at:
Day of Week: 3  (Sunday=0, Monday=1,...Saturday=6)
Hours: 12
Minutes: 30
```

See also

- `configuration event-notices-reports config`
- `configuration event-notices-reports reset`
- `schedule list`
- `scheduleSYR list`
- `scheduleSYR remove`
- `syrcollect`

scheduleSYR list

Lists the scheduled SYR data collection job.

Contexts

All contexts.

Syntax

```
scheduleSYR list
```

Example

List the SYC collection schedule:

```
VPlexcli:/> scheduleSYR list
SYR data collection job is currently scheduled at:
Day of Week: 1 (Sunday=0, Monday=1,...Saturday=6)
Hours: 23
Minutes: 30
```

See also

- configuration event-notices-reports config
- configuration event-notices-reports reset
- scheduleSYR add
- scheduleSYR remove

scheduleSYR remove

Removes the currently scheduled SYR data collection job.

Contexts

All contexts.

Syntax

```
scheduleSYR remove
```

Description

Only one SYR data collection can be scheduled. The current SYR collection cannot be modified. To modify the SYR data collection job:

- Use the scheduleSYR remove command to remove the existing collection job.
- Use the scheduleSYR add command to create a new collection job.

Example

Remove a scheduled collection:

```
VPlexcli:/> scheduleSYR remove
Removing SYR data collection job scheduled at:
Day of Week: 3  (Sunday=0, Monday=1,...Saturday=6)
Hours: 13
Minutes: 30
SYR data collection job removed successfully
```

See also

- `configuration event-notices-reports config`
- `configuration event-notices-reports reset`
- `scheduleSYR add`
- `scheduleSYR list`

script

Changes to interactive Jython scripting mode.

Contexts

All contexts.

Syntax

`script`

`[-i|--import]` *module*

`[-u|--unimport]` *module*

Arguments

Optional arguments	
`[-i|--import]` *module*	Import the specified Jython module without changing to interactive mode. After importation, commands registered by the module are available in the CLI. If the module is already imported, it is explicitly reloaded.
`[-u|--unimport]` **module**	Unimport the specified Jython module without changing to interactive mode. All the commands that were registered by that module are unregistered.

Description

Changes the command mode from VPLEX CLI to Jython interactive mode.

To return to the normal CLI shell, type a period '.' and press ENTER.

Use the `--import` and `--export` arguments to import or export the specified Jython module without changing to interactive mode.

Example

Enter Jython interactive mode:

```
VPlexcli:/> script
Jython 2.2 on java1.6.0_03
>>>
```

Exit Jython interactive mode:

```
>>> .
VPlexcli:/>
```

Import/unimport the specified Jython module without changing to interactive mode:

```
VPlexcli:/> script --import ndu
VPlexcli:/> script --unimport ndu
```

See also

* source

sessions

Displays active Unisphere for metro node sessions.

Contexts

All contexts.

Syntax

```
sessions
```

Description

Displays the username, hostname, port and start time of active sessions to the Unisphere for metro node.

Example

```
VPlexcli:/> sessions
Type            Username  Hostname   Port   Creation Time
------------    --------  ---------  -----  ----------------------------
TELNET_SHELL    service   localhost  23848  Wed Sep 15 15:34:33 UTC 2010
DEFAULT_SHELL   -         -          -      Tue Aug 03 17:16:07 UTC 2010
```

set

Changes the value of writable attributes in the given context.

Contexts

All contexts.

Syntax

```
set
```

[-d|--default]

[-f|--force]

[-a|--attributes] *pattern*

[-v|--value] *value*

Arguments

Optional arguments	
`[-d|--default]`	Sets the specified attributes to the default values, if any exist. If no attributes are specified, displays the default values for attributes in the current/specified given context.
`[-f|--force]`	Force the value to be set, bypassing any confirmations or guards.
`[-a|--attributes]` *pattern*	* Attribute selector pattern.
`[-v|--value]` *value*	* The new value to assign to the specified attributes.

* - argument is positional.

Description

Use the set command with no arguments to display the attributes available in the current context.

Use the `set --default` command with no additional arguments to display the default values for the current context or a specified context.

Use the `set` command with an attribute pattern to display the matching attributes and the required syntax for their values.

Use the set command with an attribute pattern and a value to change the value of each matching attribute to the given value.

An attribute pattern is an attribute name optionally preceded with a context glob pattern and a double-colon (::). The pattern matches the named attribute on each context matched by the glob pattern.

If the glob pattern is omitted, set assumes the current context.

If the value and the attribute name are omitted, set displays information on all the attributes on all the matching contexts.

Examples

Display which attributes are writable in the current context, and their valid inputs:

```
VPlexcli:/distributed-storage/distributed-devices/TestDisDevice> set
attribute                input-description
--------------------------------------------------------------------------------------
-------------
application-consistent  Takes one of '0', '1', 'f', 'false', 'n', 'no', 'off', 'on',
't', 'true', 'y', 'yes' (not case sensitive).
auto-resume             Takes one of '0', '1', 'f', 'false', 'n', 'no', 'off', 'on',
't', 'true', 'y', 'yes' (not case sensitive).
block-count             Read-only.
block-size              Read-only.
capacity                Read-only.
clusters-involved       Read-only.
.
.
.
```

Use the `--default` argument without any attribute(s) to display the default values for the current (or specified) context's attributes:

```
VPlexcli:/distributed-storage/distributed-devices/TestDisDevice> set --default
attribute                default-value
--------------------    ----------------
application-consistent  No default value.
auto-resume             No default value.
block-count             No default value.
.
..
```

Change the name of a meta-volume:

```
VPlexcli:/clusters/cluster-1/system-volumes/new_meta1_backup_2010May24_163810> set name
backup_May24_pre_refresh
```

Display information about attributes in the cluster-1 context:

```
VPlexcli:/> set /clusters/cluster-1
attribute                                          input-description
-------------------------------------------------- 
-------------------------------------------------------------------
/clusters/cluster-1::top-level-assembly Read-only.
/clusters/cluster-1::auto-expel-period Takes an integer between 0 and 2147483647.
/clusters/cluster-1::director-names Read-only.
/clusters/cluster-1::operational-status Read-only.
/clusters/cluster-1::default-cache-mode Read-only.
/clusters/cluster-1::default-caw-template Takes one of '0', '1', 'f', 'false', 'n',
'no', 'off', 'on', 't',
'true', 'y', 'yes' (not case sensitive).
/clusters/cluster-1::transition-progress Read-only.
/clusters/cluster-1::auto-join-delay Takes an integer between 0 and 2147483647.
/clusters/cluster-1::default-director Read-only.
/clusters/cluster-1::health-indications Read-only.
/clusters/cluster-1::island-id Read-only.
/clusters/cluster-1::transition-indications Read-only.
/clusters/cluster-1::connected Read-only.
/clusters/cluster-1::default-xcopy-template Takes one of '0', '1', 'f', 'false', 'n',
'no', 'off', 'on', 't',
'true', 'y', 'yes' (not case sensitive).
/clusters/cluster-1::name Read-only.
/clusters/cluster-1::default-write-same-16-template Takes one of '0', '1', 'f', 'false',
'n', 'no', 'off', 'on', 't',
'true', 'y', 'yes' (not case sensitive).
/clusters/cluster-1::health-state Read-only.
/clusters/cluster-1::allow-auto-join Takes one of '0', '1', 'f', 'false', 'n', 'no',
'off', 'on', 't',
'true', 'y', 'yes' (not case sensitive).
/clusters/cluster-1::auto-expel-count Takes an integer between 0 and 2147483647.
/clusters/cluster-1::cluster-id Read-only.

Display the health-state attribute for cluster-1
VPlexcli:/> set /clusters/cluster-1::health-state
attribute                input-description
------------------------ -----------------
/clusters/cluster-1::health-state Read-only.
```

Set the remote IP address and started attributes for SNMP traps:

```
VPlexcli:/notifications/call-home/snmp-traps/Test> set remote-host 10.6.213.39
VPlexcli:/notifications/call-home/snmp-traps/Test> set started true
```

Attach a rule-set to cluster1_Active to the device dd_00:

```
VPlexcli:/distributed-storage/distributed-devices> set dd_00::rule-set-name
cluster1_Active
```

Set a storage volume's thin-rebuild attribute to true:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes/clar_LUN83> set thin-
rebuild true
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes/clar_LUN83> ll
Name                     Value
------------------------ ----------------------------------------------------
application-consistent   false
.
.
.
storage-volumetype       normal
system-id                VPD83T3:6006016061212e00b0171b696696e211
thin-rebuild             true
total-free-space         0B
```

```
underlying-storage-block-size  512
use                            used
used-by                        [extent_test01_1]
vendor-specific-name           DGC
vias-based                     false
```

Enable and display iSCSI FE and BE ports:

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A/hardware/ports> ll
Name    Address        Role       Port Status
-----   -------------  ---------  -----------
ETH02   128.221.252.97 local-com  up
ETH03   128.221.253.97 local-com  up
ETH04   192.168.11.35  wan-com    up
ETH05   10.6.11.35     wan-com    up
ETH06   192.168.71.58  front-end  up
ETH07   192.168.91.58  front-end  up
ETH08   192.168.50.58  back-end   up
ETH09   192.168.152.58 back-end   up
```

Enable and display ports:

```
VPlexcli:/clusters/cluster-1/directors/director-1-1-A/hardware/ports> ll
  Name      Address             Role       Port Status
  -------   ------------------  ---------  -----------
  A0-FC00   0x5000144260006e00  front-end  no-link
  A0-FC01   0x5000144260006e01  front-end  up
  A0-FC02   0x5000144260006e02  front-end  up
  A0-FC03   0x0000000000000000  front-end  down
  A1-FC00   0x5000144260006e10  back-end   up
  A1-FC01   0x5000144260006e11  back-end   up
  A1-FC02   0x5000144260006e12  back-end   no-link
  A1-FC03   0x5000144260006e13  back-end   no-link
  A2-FC00   0x5000144260006e20  wan-com    up
  A2-FC01   0x5000144260006e21  wan-com    up
  A2-FC02   0x5000144260006e22  wan-com    no-link
  A2-FC03   0x5000144260006e23  wan-com    no-link
  A3-FC00   0x5000144260006e30  local-com  up
  A3-FC01   0x5000144260006e31  local-com  up
  A3-FC02   0x0000000000000000  -          down
  A3-FC03   0x0000000000000000  -          down
VPlexcli:/clusters/cluster-1/directors/director-1-1-A/hardware/ports> set A0-
FC03::enabled true
VPlexcli:/clusters/cluster-1/directors/director-1-1-A/hardware/ports> ll
  Name      Address             Role       Port Status
  -------   ------------------  ---------  -----------
  A0-FC00   0x5000144260006e00  front-end  no-link
  A0-FC01   0x5000144260006e01  front-end  up
  A0-FC02   0x5000144260006e02  front-end  up
  A0-FC03   0x5000144260006e03  front-end  no-link
  A1-FC00   0x5000144260006e10  back-end   up
  A1-FC01   0x5000144260006e11  back-end   up
  A1-FC02   0x5000144260006e12  back-end   no-link
  A1-FC03   0x5000144260006e13  back-end   no-link
  A2-FC00   0x5000144260006e20  wan-com    up
  A2-FC01   0x5000144260006e21  wan-com    up
  A2-FC02   0x5000144260006e22  wan-com    no-link
  A2-FC03   0x5000144260006e23  wan-com    no-link
  A3-FC00   0x5000144260006e30  local-com  up
  A3-FC01   0x5000144260006e31  local-com  up
  A3-FC02   0x0000000000000000  -          down
  A3-FC03   0x0000000000000000  -          down
```

Change and display the name of a virtual volume:

ⓘ **NOTE:** Changing a virtual volume name will not cause any impact to host I/O.

```
VPlexcli:/clusters/cluster-1/virtual-volumes/EMC-CLARiiON-0075-VNX-LUN122_1_vol>set
-a name -v new_name
VPlexcli:/clusters/cluster-1/virtual-volumes/new_name> ll
Name               Value
------------------ --------------------------------------------
```

```
 block-count           2621440
 block-size            4K
 cache-mode            synchronous
 capacity              10G
 consistency-group     -
 expandable            true
 health-indications    []
 health-state          ok
 locality              local
 operational-status    ok
 scsi-release-delay    0
 service-status        running
 storage-tier          -
 supporting-device     device_EMC-CLARiiON-APM00113700075-VNX_LUN122_1
 system-id             EMC-CLARiiON-0075-VNX-LUN122_1_vol
 volume-type           virtual-volume
```

Return to the virtual-volumes context and change directory to the new name:

```
VPlexcli:/clusters/cluster-1/virtual-volumes/new_name> cd ..
VPlexcli:/clusters/cluster-1/virtual-volumes> cd new_name
```

Run a listing on the volume to display the new name for the system-id:

```
VPlexcli:/clusters/cluster-1/virtual-volumes/new_name> ll
Name                  Value
-----------------     ------------------------------------------------
block-count           2621440
block-size            4K
cache-mode            synchronous
capacity              10G
consistency-group     -
expandable            true
health-indications    []
health-state          ok
locality              local
operational-status    ok
scsi-release-delay    0
service-status        running
storage-tier          -
supporting-device     device_EMC-CLARiiON-APM00113700075-VNX_LUN122_1
system-id             new_name
volume-type           virtual-volume
```

Set the SPC version to Version 3 on an initiator port:

```
VPlexcli:/clusters/cluster-1/exports/initiator-ports/test_port_1> set scsi-spc-version 3

To avoid Data Unavailability and host issues, follow the procedure described in the KB
article 'SPC-3 support in VPLEX' to change the SPC version.
SPC-3 must be applied only on the supported Operating Systems that are listed in the KB
article. Continue?   (Yes/No)
```

```
VPlexcli:/clusters/cluster-1/exports/initiator-ports/test_port_1> ll
Name                Value
----------------    ---------------------------------------------------------------
node-wwn            0x20000025b505003f
port-wwn            0x200000cc05bb002e
scsi-spc-version    3
suspend-on-detach   -
target-ports        [P0000000043E00BDD-A0-FC00, P0000000043E00BDD-A0-FC01,
                    P0000000043F00BDD-B0-FC00, P0000000043F00BDD-B0-FC01]
type                default
```

Set the SPC version to Version 3 on a storage view:

```
VPlexcli:/clusters/cluster-1/exports/storage-views/test_view_1> set scsi-spc-version 3
To avoid Data Unavailability and host issues, follow the procedure described in the KB
article 'SPC-3 support in VPLEX' to change the SPC version.
SPC-3 must be applied only on the supported Operating Systems that are listed in the KB
```

```
article. The new SPC version is applied to all the initiators
in the storage-view. Continue?   (Yes/No) Yes
```

```
VPlexcli:/clusters/cluster-1/exports/storage-views/test_view_1> ll
Name                       Value
----------------------
--------------------------------------------------------------------------------
--------------
caw-enabled                true
controller-tag             -
initiators                 [test_port]
operational-status         ok
port-name-enabled-status   [P0000000043E00BDD-A0-FC00,true,ok, P0000000043E00BDD-A0-
FC01,true,ok,
                           P0000000043F00BDD-B0-FC00,true,ok, P0000000043F00BDD-B0-
FC01,true,ok]
ports                      [P0000000043E00BDD-A0-FC00, P0000000043E00BDD-A0-FC01,
P0000000043F00BDD-B0-FC00,
                           P0000000043F00BDD-B0-FC01]
scsi-spc-version           3
virtual-volumes            [(0,device_C1-
RHEL_XtremIO0547_LUN_00001_1_vol,VPD83T3:6000144000000010f00bddd268733d19,200G)]
write-same-16-enabled      true
xcopy-enabled              true
```

See also

- storage-volume claim
- storage-volume unclaim

set topology

Changes the topology attribute for a Fibre Channel port.

Contexts

/clusters/cluster/directors/director/hardware/ports/port

Syntax

```
set topology
[p2p|loop]
```

Arguments

Required arguments	
p2p	Sets the port's topology as point-to-point. The port comes up as an F-port. Use the p2p topology to connect the Fibre Channel fabric to a node.
loop	Sets the port's topology as loop. The port comes up as an FL-Port. Use the loop topology to connect a Fibre Channel Arbitrated Loop (ring-style network topology) to a fabric.

Description

Change the default setting for a Fibre Channel port.

Default: p2p.

ⓘ **NOTE:** According to best practices, the front-end ports should be set to the default p2p and connected to the hosts via a switched fabric.

⚠ **WARNING: It is not recommended to change the topology on the local COM ports, as it can lead to the directors going down and data unavailability.**

Example

Navigate to a Fibre Channel port context and set the topology as p2p:

```
VPlexcli:/> cd /clusters/cluster-1/directors/Cluster_1_Dir1A/hardware/ports/A4-FC02
VPlexcli:/clusters/cluster-1/directors/Cluster_1_Dir1A/hardware/ports/A4-FC02> set
topology p2p
VPlexcli:/clusters/cluster-1/directors/Cluster_1_Dir1A/hardware/ports/A4-FC02> ll
Name                 Value
-----------------    ------------------
address              0x5000144240014742
current-speed        8Gbits/s
description          -
enabled              true
max-speed            8Gbits/s
node-wwn             0x500014403ca00147
operational-status   ok
port-status          up
port-wwn             0x5000144240014742
protocols            [fc]
role                 wan-com
target-port          -
topology             p2p
```

See also

* `set`

show-use-hierarchy

Display the complete usage hierarchy for a storage element from the top-level element down to the storage-array.

Contexts

All contexts.

Syntax

```
show-use-hierarchy
[-t|--targets] path, path,...
```

Arguments

Required arguments	

`[-t|--targets]`
path, *path*,...
	* Comma separated list of target storage elements.
	
	You can specify meta, logging and virtual volumes, local and distributed devices, extents, storage-volumes or logical-units on a single command line.
	
	ⓘ **NOTE:** A complete context path to the targets must be specified. For example:
	
	`show-use-hierarchy /clusters/cluster-1/storage-elements/storage-volumes/`
	`volume`
	
	or:
	
	`show-use-hierarchy /clusters/cluster-1/storage-elements/storage-`
	`volumes/*`

* - argument is positional.

Description

This command drills from the specified target up to the top-level volume and down to the storage-array. The command will detect sliced elements, drill up through all slices and indicate in the output that slices were detected. The original target is highlighted in the output.

See also

- `drill-down`
- `tree`

sms dump

Collects the logs files on the management server.

Contexts

All contexts.

Syntax

```
sms dump
[-d|--destination-directory] directory
[-t|--target_log] logName
```

Arguments

Required arguments	
`[-d| --destination-directory]` *directory*	Destination directory for the sms dump logs.

Optional arguments	
`[-t|--target_log]` *logName*	Collect only files specified under logName from smsDump.xml.

Description

Collects the following log files:

(i) **NOTE:** The log files listed below are the core set of files along with other files that are not listed.

Clilogs

- /var/log/VPlex/cli/client.log* -- VPlexcli logs, logs dumped by VPlexcli scripts
- /var/log/VPlex/cli/session.log* -- what the user does in a VPlexcli session
- /var/log/VPlex/cli/firmware.log* -- nsfw.log files from all directors

ConnectEMC

- /var/log/ConnectEMC/logs/* -- connectemc logs
- /opt/emc/connectemc/archive -- connectemc logs
- /opt/emc/connectemc/failed -- connectemc logs
- /opt/emc/connectemc/*.xml -- connectemc logs
- /opt/emc/connectemc/*.ini -- connectemc logs
- /var/log/VPlex/cli/ema_adaptor.log*

Configuration

- /var/log/VPlex/cli/*.config
- /var/log/VPlex/cli/*xml
- /var/log/VPlex/cli/*.properties
- /var/log/cli/persistentstore.xml -- generated when user connects to VPlexcli
- /var/log/VS1/cli/persistentstore.xml -- generated when user connects to VPlexcli
- /var/log/VPlex/cli/connections -- what the VPlexcli is connected to.
- /var/log/VPlex/cli/VPlexcommands.txt
- /var/log/VPlex/cli/VPlexconfig.xml
- /var/log/VPlex/cli/VPlexcli-init
- /opt/backup/*.ini
- /opt/vs1/backup/*.ini
- /opt/backup/*.xml
- /opt/vs1/backup/*.xml
- /opt/emc/VPlex/*.xml
- /opt/emc/VPlex/*.properties

Upgrade

- /var/log/VPlex/cli/capture/* (ndu status files)
- /tmp/VPlexInstallPackages/*.xml
- /tmp/VPlexInstallPackages/*.properties
- /tmp/VPlexInstallPackages/*.log
- /var/log/install.log

system

- /var/log/warn*
- /var/log/messages*
- /var/log/boot.msg
- /var/log/boot.omsg
- /var/log/firewall
- /etc/sysconfig/SuSEfirewall2
- /etc/sysconfig/network/ifcfg*
- /etc/sysconfig/network/ifroute*
- /etc/sysctl.conf

Examples

Collect the logs files on the management server and send them to the designated directory:

```
VPlexcli:/> sms dump --destination-directory /var/log/VPlex/cli
Initiating sms dump...
sms dump completed to file /var/log/VPlex/cli/smsDump_2010-09-15_16.40.20.zip.
```

See also

- cluster configdump
- collect-diagnostics
- director appdump
- getsysinfo

source

Reads and executes commands from a script.

Contexts

All contexts.

Syntax

```
source
```

```
[-f|--file] filename
```

Arguments

Required arguments	
[-f| --file] filename	* Name of the script file to read and execute.

* - argument is positional.

Description

Filenames use the syntax of the underlying platform.

The script file may contain any CLI commands.

If the exit command is included, the shell exits immediately, without processing the commands that follow it in the file.

Examples

In the following example, a text file Source.txt contains only two commands:

```
service@ManagementServer:/var/log/VPlex/cli> cat Source.txt
version -a
exit
When executed:
```

```
The first command in the file is run
The exit command exits the command shell
VPlexcli:/> source --file /var/log/VPlex/cli/Source.txt
What                                             Version        Info
------------------------------------------------ -------------- ----
Product Version                                  4.1.0.00.00.12 -
SMSv2                                            0.16.15.0.0    -
Mgmt Server Base                                 D4_MSB_7       -
Mgmt Server Software                             D4.70.0.9      -
/engines/engine-2-1/directors/Cluster_2_Dir_1B  1.2.43.9.0     -
/engines/engine-2-1/directors/Cluster_2_Dir_1A  1.2.43.9.0     -
/engines/engine-1-1/directors/Cluster_1_Dir1B   1.2.43.9.0     -
/engines/engine-1-1/directors/Cluster_1_Dir1A   1.2.43.9.0     -
/engines/engine-2-2/directors/Cluster_2_Dir_2B  1.2.43.9.0     -
/engines/engine-2-2/directors/Cluster_2_Dir_2A  1.2.43.9.0     -
Connection closed by foreign host.
service@ManagementServer:~>
```

See also

- `script`

storage-tool dismantle

Dismantles virtual-volumes, devices (local or distributed) and extents down to the storage-volumes, including unclaiming the storage-volumes.

Contexts

All contexts.

Syntax

`storage-tool dismantle`

`[--do-not-unclaim]`

`[-h | --help]`

`[--verbose]`

`[-f | --force]`

`[-s | --storage-extents=` *storage-extent* [, *storage-extent*] ...]]

Arguments

Optional arguments	
`[-h	--help]`	Displays the usage for this command.
`[--verbose]`	Provides more output during command execution. This may not have any effect for some commands.
`[-f	--force]`	Do not ask for confirmation.
`--do-not-unclaim`	Skips unclaiming of the storage-volume. ⓘ **NOTE:** By default, the storage volumes are unclaimed.
Required arguments	

`[-s | --storage-extents=` *storage-extent* [, *storage-extent*] ...]]	Specifies the storage-extents (virtual-volumes, local or distributed devices or extents) to dismantle.

* argument is positional

Description

Dismantles virtual-volumes, devices (local or distributed) and extents down to the storage-volumes, including unclaiming the storage-volumes.

Run `storage-tool dismantle` against top-level storage elements only. If you run `storage-tool dismantle` against virtual-volumes, they must not belong to either a consistency-group or storage-view.

ⓘ **NOTE:** This command does NOT allow dismantling of consistency groups or storage views, or of storage extents that are not root nodes in a storage hierarchy (i.e. targets must not be supporting other storage).

The command fails with an exception before dismantling anything if:

- A volume to be dismantled is exported in a view and that view is not a dismantle target.
- A volume to be dismantled is in a consistency group and that consistency group is not a dismantle target.
- The dismantle target is supporting other storage (i.e. has anything above it).

storage-tool compose

Creates a virtual-volume on top of the specified storage-volumes, building all intermediate extents, local, and distributed devices as necessary.

Contexts

All contexts.

Syntax

```
storage-tool compose
[-n|--name] name
[-g|--geometry] {raid-0|raid-1|raid-c}
[-d|--storage-volumes] storage-volume [, storage-volume...]
[-m|--source-mirror] source-mirror
[-c|--consistency-group] consistency-group
[-v|--storage-views] storage-view [, storage-view ...]
[-t|--thin]
[-h|--help]
[--verbose]
```

Arguments

Required arguments	
`[-n|--name]` *name*	* Specifies the name for the new virtual volume. Must be unique across the system.
`[-g|--geometry] {raid-0 |raid-1| raid-c}`	* Specifies the geometry to use for the local devices at each cluster. Valid values are raid-0, raid-1, or raid-c.

Optional arguments	
[-d|--storage- volumes] *storage-volume* [, *storage-volume*...]	* Specifies a list of storage volumes to build the virtual volume from. These may be claimed, but must be unused.
[-m|--source- mirror] *source-mirror*	Specifies the storage volume to use as a source mirror when creating local and distributed devices. ⓘ **NOTE:** If specified, `--source-mirror` will be used as a source-mirror when creating local and distributed RAID 1 devices. This will trigger a rebuild from the source-mirror to all other mirrors of the RAID 1 device (local and distributed). While the rebuild is in progress the new virtual volume (and supporting local and/or distributed devices) will be in a degraded state, which is normal. This option only applies to RAID 1 local or distributed devices. The `--source-mirror` may also appear in --storage-volumes.
[-c|--consistency- group] *consistency-group*	Specifies the context path of a consistency group that the new virtual volume should be added to. The new virtual-volume's global geometry must be compatible with the consistency group's storage-at-clusters attribute.
[-v|--storage- views] *storage-view* [, *storage-view*...]	Specifies the context path of the storage views that the new virtual volume will be added to. The new virtual volume's global geometry must be compatible with the storage view's locality.
[-t|--thin]	Specifies whether the new virtual-volume is thin-enabled or not. The supporting storage-volumes must be thin-capable in order for a virtual-volume to be thin-enabled. The virtual-volume must also have a valid RAID geometry to be thin-enabled.
[-h|--help]	Displays command line help.
[--verbose]	Provides more help during command execution. This may not have any effect for some commands.

* - argument is positional.

Description

This command supports building local or distributed (i.e., distributed RAID 1 based) virtual volumes with RAID 0, RAID 1, or RAID C local devices. It does not support creating multi-device storage hierarchies (such as a RAID 1 on RAID 0s on RAID Cs).

For RAID 1 local devices, a maximum of eight legs may be specified.

If the new virtual volume's global geometry is not compatible with the specified consistency group or storage views, the virtual volume will not be created. However, failure to add the new virtual volume to the specified consistency group or storage views does not constitute an overall failure to create the storage and will not be reported as such.

ⓘ **NOTE:** In the event of an error, the command will not attempt to perform a roll-back and destroy any intermediate storage objects it has created. If cleanup is necessary, use the `show-use-hierarchy` command on each storage volume to identify all residual objects and delete each one manually.

The `--stop-at` option imposes the following constraints on other options:

● If `--stop-at`=*virtual-volume*, only the `--consistency-group` and `--storage-views` options can be specified.
● If `--stop-at`=*local-device*, storage-volumes from only one cluster can be specified.
● If`--stop-at`=*distributed-device*, storage-volumes from at least two clusters must be specified.

Example

Create a thin-capable virtual volume with RAID 0 local devices and specified storage volumes:

```
VPlexcli:/clusters/cluster-1/virtual-volumes> storage-tool compose --name myVolume --
storage-volumes thin_capable_sv_1
--thin --geometry raid-0
Successfully created /clusters/cluster-1/virtual-volumes/myVolume.
VPlexcli:/clusters/cluster-1/virtual-volumes> ll myVolume/
```

```
/clusters/cluster-1/virtual-volumes/myVolume:
Name                     Value
------------------------ ----------------------------------------
block-count              2621440
block-size               4K
cache-mode               synchronous
capacity                 10G
consistency-group        -
expandable               true
expandable-capacity      0B
expansion-method         storage-volume
expansion-status         -
health-indications       []
health-state             ok
locality                 local
operational-status       ok
scsi-release-delay       0
service-status           unexported
storage-tier             -
supporting-device        device_myVolume_c1
system-id                myVolume
thin-capable             true
thin-enabled             true
volume-type              virtual-volume
vpd-id                   VPD83T3:6000144000000010e018b6fbc02ab396


VPlexcli:/clusters/cluster-1/virtual-volumes>
```

Example

Create a virtual volume with RAID 1 local devices and specified storage volumes:

```
VPlexcli:/> storage-tool compose --name TEST --geometry raid-1 --storage-volumes
VPD83T3:60060160cea33000fc39e04dac48e211, VPD83T3:60060160cea33000fb9c532eac48e211,
VPD83T3:600601605a903000f2a9692fa548e211, VPD83T3:600601605a903000f3a9692fa548e211
```

See also

- `storage-volume unclaim`

storage-volume auto-unbanish-interval

Displays or changes auto-unbanish interval on a single director.

Contexts

All contexts.

In `/clusters/cluster/storage-elements/storage-volumes` context, command is `auto-unbanish-interval`.

Syntax

`storage-volume auto-unbanish-interval`

`[-n|--director]` *path*

`[-i|--interval]` [*seconds*]

Arguments

Required arguments	
`[-n|--director]` *path*	* The director on which to show or change the delay for automatic unbanishment.
Optional arguments	
`[-i|--interval] [` *seconds*`]`	Number of seconds the director firmware waits before unbanishing a banished storage volume (LUN). Range: 20 seconds - no upper limit. Default: 30 seconds.

* - argument is positional.

Description

See "Banished storage volumes (LUNs)" in the storage-volume unbanish command description.

At regular intervals, the metro node directors look for logical units that were previously banished. If metro node finds banished logical units, it unbanishes them. This process happens automatically and continuously, and includes a delay interval with a default value of 30 seconds.

Every 30 seconds the process looks for previously banished logical units and unbanishes any it finds.

Use this command to display change the delay interval.

ⓘ **NOTE:** This change in the interval value is not saved between restarts of the director firmware (NDU, director reboots). When the director firmware is restarted, the interval value is reset to the default of 30 seconds.

Use the `auto-unbanish-interval --director` *director* command to display the current delay (in seconds) for automatic unbanishment on the specified director.

Use the `auto-unbanish-interval --director` *director* `--interval` *interval* command to change the delay timer for the specified director to the specified number of seconds.

The default metric for setting the `--interval` argument is seconds, but minutes and hours, and days are accepted. The following are valid values for the `--interval` argument: 2s, 2second, 2seconds, 2sec, 2min, 2minute, 2minutes, 2hr, 2hours, 2hour.

ⓘ **NOTE:** The interval is displayed in seconds.

Example

In the following example:

● The `auto-unbanish-interval --director director --interval` *interval* command changes the delay timer to 200 seconds.
● The `auto-unbanish-interval --director` *director* command displays the new setting.

```
VPlexcli:/> storage-volume auto-unbanish-interval --director director-1-1-A --
interval 200
VPlexcli:/> storage-volume auto-unbanish-interval --director director-1-1-A
200 seconds
```

See also

● `storage-volume list-banished`
● `storage-volume unbanished`

storage-volume claim

Claims the specified storage volumes.

Contexts

All contexts.

In `/clusters/cluster/storage-elements/storage-volumes` context, command is `claim`.

Syntax

```
storage-volume claim
[--appc]
[-n|--name] name
--thin-rebuild

--batch-size integer
[-d|--storage-volumes] path,path...
[-f|--force]
```

Arguments

Required arguments	
`[-d|--storage-volumes]` *path,path...*	* List of one or more storage volumes to claim.
Optional arguments	
`[--appc]`	Make the specified storage volumes application consistent. Prevents data already on the specified storage volumes from being deleted or overwritten during the process of constructing a virtual volume. After a virtual volume is constructed using this storage volume, there is no restriction on the access to the data, i.e. the data can be overwritten by host I/O. ⚠ **CAUTION: The application consistent attribute may be modified using the `set` command but only when the storage volume is in the claimed state. The application consistent attribute may not be altered for storage volumes that are unclaimed or in use.**
`[-n|--name]` *name*	The new name of the storage volume after it is claimed.
`--thin-rebuild`	Claims the specified storage volumes as "thin". Thin storage allocates blocks of data on demand versus allocating all the blocks up front. If a storage volume has already been claimed, it can be designated as thin using the set command.
`--batch-size` *integer*	When using wildcards to claim multiple volumes with one command, the maximum number of storage volumes to claim at once.
`[-f|--force]`	Force the storage volume to be claimed. For use with non-interactive scripts.

* - argument is positional.

Description

A storage volume is a device or LUN that is visible to metro node. The capacity of storage volumes is used to create extents, devices and virtual volumes.

Storage volumes must be claimed, and optionally named before they can be used in a metro node cluster. Once claimed, the storage volume can be used as a single extent occupying the volume's entire capacity, or divided into multiple extents (up to 128).

This command can fail if there is not a sufficient number of meta volume slots. See the troubleshooting section of the metro node procedures in the SolVe Desktop for a resolution to this problem.

Thin provisioning

Thin provisioning allows storage to migrate onto a thinly provisioned storage volumes while allocating the minimal amount of thin storage container capacity.

Thinly provisioned storage volumes can be incorporated into RAID 1 mirrors with similar consumption of thin storage container capacity.

Metro node preserves the unallocated thin pool space of the target storage volume by detecting zeroed data content before writing, and suppressing the write for cases where it would cause an unnecessary allocation. metro node requires you to specify thin provisioning for each back-end storage volume. If a storage volume is thinly provisioned, the thin-rebuild attribute must be true either during or after claiming.

> ⚠ **CAUTION: If a thinly provisioned storage volume contains non-zero data before being connected to metro node, the performance of the migration or initial RAID 1 rebuild is adversely affected.**
> **System volumes are supported on thinly provisioned LUNs, but these volumes must have their full capacity of thin storage container resources set aside and not be in competition for this space with any user-data volumes on the same pool.**

If:

● The thin storage allocation pool runs out of space, and
● If this is the last redundant leg of the RAID 1,

further writing to a thinly provisioned device causes the volume to lose access to the device.

Examples

In the following example:

● The `ll` command in `storage-volumes` context displays the available storage.
● The `claim` command claims the specified unclaimed storage volume from the `clusters/`*`cluster`*`/storage-elements/storage-volumes` context.

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes>ll
 .
 .
```

Name	VPD83 ID	Capacity	Use	Vendor	IO Status	Type	Thin Rebuild
Basic_c1_ramdisk_100GB_684_	VPD83T3:60001440000000103017dfea88355431	100G	claimed	EMC	alive	normal	false
Basic_c1_ramdisk_100GB_685_	VPD83T3:60001440000000103017dfea88355433	100G	claimed	EMC	alive	normal	false
Basic_c1_ramdisk_100GB_686_	VPD83T3:60001440000000103017dfea88355435	100G	claimed	EMC	alive	normal	false
Basic_c1_ramdisk_100GB_687_	VPD83T3:60001440000000103017dfea88355437	100G	claimed	EMC	alive	normal	false
Basic_c1_ramdisk_100GB_688_	VPD83T3:60001440000000103017dfea88355439	100G	claimed	EMC	alive	normal	false
Basic_c1_ramdisk_100GB_689_	VPD83T3:60001440000000103017dfea8835543b	100G	claimed	EMC	alive	normal	false
Basic_c1_ramdisk_100GB_68_	VPD83T3:60001440000000103017dfea88354f61	100G	claimed	EMC	alive	normal	false
Basic_c1_ramdisk_100GB_690	VPD83T3:60001440000000103017dfea8835543d	100G	claimed	EMC	alive	normal	false
Basic_c1_ramdisk_100GB_691_	VPD83T3:60001440000000103017dfea8835543f	100G	claimed	EMC	alive	normal	false
Basic_c1_ramdisk_100GB_692_	VPD83T3:60001440000000103017dfea88355441	100G	claimed	EMC	alive	normal	false

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> claim --storage-
volumes VPD83T3:6006016021d025007029e95b2327df11
```

Claim a storage volume and name it Symm1254_7BF from the clusters/cluster context:

```
VPlexcli:/clusters/cluster-1> storage-volume claim -name Symm1254_7BF  -d
VPD83T3:600009700001926012545330303742A1
```

Claim storage volumes using the `--thin-rebuild` option. In the following example:

- The `claim` command with `--thin-rebuild` claims two storage volumes as thin storage (from the `clusters/`*cluster*`/storage-elements/storage-volumes` context)
- The `ll` command displays one of the claimed storage volumes:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes>
claim --thin-rebuild --storage-volumes
VPD83T3:6006016091c50e005057534d0c17e011,VPD83T3:6006016091c50e005257534d0c17e011
Of the 2 storage-volumes that were given, 2 storage-volumes were claimed.
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> ll
VPD83T3:6006016091c50e005057534d0c17e011
/clusters/cluster-1/storage-elements/storage-volumes/
VPD83T3:6006016091c50e005057534d0c17e011:
Name                  Value
--------------------  ----------------------------------------------------
application-consistent false
block-count           524288
block-size            4K
capacity              2G
description           -
free-chunks           ['0-524287']
health-indications    []
health-state          ok
io-status             alive
itls                  0x5000144230354911/0x5006016930600523/6,
                      0x5000144230354910/0x5006016930600523/6,
                      0x5000144230354910/0x5006016830600523/6,
                      0x5000144230354911/0x5006016830600523/6,
                      0x5000144220354910/0x5006016930600523/6,
                      0x5000144220354910/0x5006016830600523/6,
                      0x5000144220354911/0x5006016930600523/6,
                      0x5000144220354911/0x5006016830600523/6
largest-free-chunk    2G
locality              -
operational-status    ok
storage-array-name    EMC-CLARiiON-APM00042201310
storage-volumetype    normal
system-id             VPD83T3:6006016091c50e005057534d0c17e011
thin-capable          false
thin-rebuild          false
total-free-space      2G
use                   claimed
used-by               []
vendor-specific-name  DGC
```

Claim multiple storage volumes whose names begin with VPD83T3:600601602:

```
VPlexcli:/clusters/cluster-1> storage-volume claim --storage-volumes VPD83T3:600601602*
```

See also

- `set`
- `storage-volume claimingwizard`
- `storage-volume unclaim`

storage-volume claimingwizard

Finds unclaimed storage volumes, claims them, and names them appropriately.

Contexts

All contexts.

In `/clusters/cluster/storage-elements/storage-volumes` context, command is `claimingwizard`.

Syntax

```
storage-volume claimingwizard
[-c|--cluster] cluster

[-f|--file] file,file...
[-d|--dryRun]

[-t|--set-tier] list
[--force]
--appc
--thin-rebuild
```

Arguments

Optional arguments	
`[-c|--cluster]` *cluster*	- Cluster on which to claim storage.
`[-f|--file]` *file,file...*	List of one or more files containing hints for storage-volume naming, separated by commas. Required for claiming volumes on storage arrays that do not include their array and serial number in response to SCSI inquiries.
`[-d|dryRun]`	Do a dry-run only, do not claim and name the storage volumes.
`[-t|--set-tier]` *list*	Set a storage tier identifier per storage array in the storage-volume names. Type multiple arrayName, tier-character pairs separated by commas. Storage tier identifiers cannot contain underscores.
`[--force]`	Forces a successful run of the claimingwizard. For use with non-interactive scripts.
`--appc`	Make the specified storage volumes 'application consistent'. Prevents data already on the specified storage volume from being deleted or overwritten. ⚠ **CAUTION: Once set, the application consistent attribute cannot be changed. This attribute can only be set when the storage-volumes or extents are in the claimed state.**
`--thin-rebuild`	Claims the specified storage volumes as "thin". Thin storage allocates blocks of data on demand versus allocating all the blocks up front. Thin provisioning eliminates almost all unused storage and improves utilization rates.

Description

You must first claim and optionally name a storage volume before using the storage volume in a metro node cluster.

Storage tiers allow the administrator to manage arrays based on price, performance, capacity and other attributes. If a tier ID is assigned, the storage with a specified tier ID can be managed as a single unit. Storage volumes without a tier assignment are assigned a value of 'no tier'.

This command can fail if there is not a sufficient number of meta volume slots. See the troubleshooting section of the metro node procedures in the SolVe Desktop for a resolution to this problem.

The following table lists examples to create hint files:

Table 13. Create hints files for storage-volume naming

Storage array	Command to create hints file
Dell EMC CLARiiON	`navicli -h 192.168.47.27 getlun -uid -name > Clar0400.txt`
Dell EMC Symmetrix	`symdev -sid 781 list -wwn > Symm0781.txt`
Dell EMC metro node	`export storage-view map -f EMC_PROD12.txt -v <>\\ views`
IBM DS4300	`SMcli 192.168.97.121 -c "show logicalDrives;" > DS4300_121.txt`
IBM Nextra	`xcli -c nextra_lab -x vol_list > Nextra_lab.txt`
HP EVA	`sssu "select manager hostname username=username password=password" "select system systemname "ls vdisk full" > filename.txt`
Generic	Text file of the following format: ``` > Generic storage-volumes > VPD83T3:600a0b800011ea0a000073c5468cedbd MyName1 > 600a0b800011ea0a000073c5468cedbc MyName2 > vpd83t3:600A0b800011EA0a000073c5468cEdbD MyName3 ``` For generic storage volumes, names may include letters, numbers, and '_'.

Example

Use the `--set-tier` argument to add or change a storage tier identifier in the storage-volume names from a given storage array. For example:

```
VPlexcli:/clusters/cluster-1> storage-volume claimingwizard --set-tier ="(Clar0400, L),
(Symm04A1, H)"
```

names all storage volumes from the CLARiiON array as Clar0400L_llun name, and all storage volumes from the Symmetrix® array as Symm04A1H_*lun name*

Dell EMC Symmetrix, HDS 9970/9980 and USP V storage arrays include their array and serial number in response to SCSI inquiries. The claiming wizard can claim their storage volumes without additional information. Names are assigned automatically.

Other storage arrays require a hints file generated by the storage administrator using the array's command line. The hints file contains the device names and their World Wide Names.

Use the `--file` argument to specify a hints file to use for naming claimed storage volumes.

In the following example, the `claimingwizard` command with no arguments claims storage volumes from an Dell EMC Symmetrix array:

```
VPlexcli:/clusters/cluster-1> storage-volume claimingwizard
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> ll
```

Name	VPD83 ID	Capacity	Use	Vendor	IO Status	Type	Thin Rebuild
Symm2773_05F3	VPD83T3:60000970000192602773533030030354633	10G	claimed	EMC	alive	normal	false
Symm2773_05F4	VPD83T3:60000970000192602773533030030354634	10G	claimed	EMC	alive	normal	false
Symm2773_05F5	VPD83T3:60000970000192602773533030030354635	10G	claimed	EMC	alive	normal	false
Symm2773_05F6	VPD83T3:60000970000192602773533030030354636	10G	claimed	EMC	alive	normal	false
Symm2773_05F7	VPD83T3:60000970000192602773533030030354637	10G	claimed	EMC	alive	normal	false
Symm2773_05F8	VPD83T3:60000970000192602773533030030354638	10G	claimed	EMC	alive	normal	false
Symm2773_05F9	VPD83T3:60000970000192602773533030030354639	10G	claimed	EMC	alive	normal	false

Note that the Symmetrix storage volumes are named in the format:

```
Symmlast-4-digits-of-array-serial-number_Symmetrix-Device-Number
```

In the following example:

- The `--cluster` argument specifies cluster-1
- The `--file` argument specifies a CLARiiON hints file containing device names and World Wide Names
- The `--thin-rebuild` argument claims the specified storage volumes as thin (data will be allocated on demand versus up front)

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> claimingwizard --cluster
cluster-1 --file /home/service/clar.txt --thin-rebuild
Found unclaimed storage-volume VPD83T3:6006016091c50e004f57534d0c17e011 vendor DGC :
claiming and naming clar_LUN82.
Found unclaimed storage-volume VPD83T3:6006016091c50e005157534d0c17e011 vendor DGC :
claiming and naming clar_LUN84.
Claimed 2 storage-volumes in storage array clar
Claimed 2 storage-volumes in total.
```

Find and claim storage volumes on any array in cluster-1 that does not require a hints file from the `/clusters/cluster/storage-elements/storage-volumes` context:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> claimingwizard
Found unclaimed storage-volume VPD83T1:HITACHI R45150040023 vendor HITACHI : claiming
and naming HDS20816_0023.
Found unclaimed storage-volume VPD83T1:HITACHI R45150040024 vendor HITACHI : claiming
and naming HDS20816_0024.
.
.
.
Fri, 20 May 2011 16:38:14 +0000 Progress : 6/101 storage_volumes processed (6%).
.
.
.
Fri, 20 May 2011 16:38:14 +0000 Progress : 96/101 storage_volumes processed (96%).
.
.
.
Claimed 37 storage-volumes in storage array Symm0487
Claimed 64 storage-volumes in storage array HDS20816
Claimed 101 storage-volumes in total.
```

See also

- `storage-volume claim`
- `storage-volume unclaim`

storage-volume find-array

Searches storage arrays for the specified storage-volumes.

Contexts

All contexts.

In `/clusters/cluster/storage-elements/storage-volumes` context, command is `find-array`.

Syntax

```
storage-volume find-array
  [-d|--opt_s_vol] storage-volume
```

Arguments

Required arguments	
`[-d|--opt_s_vol]` *storage-volume*	* Storage volume pattern for which to search. The pattern conforms to glob. The following pattern symbols are supported: *, ?, [*seq*], [!*seq*].

* argument is positional.

Description

Searches all the storage arrays in all clusters for the specified storage volumes.

The search is case-sensitive.

Example

Find all storage arrays for storage volumes in cluster-1:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> find-array *
Searching for cluster-1_journal
Storage-volume: cluster-1_journal is in: /clusters/cluster-1/storage-elements/storage-
arrays/EMC-Invista-14403b
Searching for cluster-1_journal_1
Storage-volume: cluster-1_journal_1 is in: /clusters/cluster-1/storage-elements/storage-
arrays/EMC-Invista-14403b
Searching for CLAR1912_10G_Aleve_1_vol_1
Storage-volume: CLAR1912_10G_Aleve_1_vol_1 is in: /clusters/cluster-1/storage-elements/
storage-arrays/EMC-CLARiiON-APM001115019l2
Searching for CLAR1912_10G_Aleve_1_vol_2
Storage-volume: CLAR1912_10G_Aleve_1_vol_2 is in: /clusters/cluster-1/storage-elements/
storage-arrays/EMC-CLARiiON-APM001115019l2
.
.
.
```

Find a storage array for a specified storage volume:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> find-array -d
VPD83T3:60060160d2a02c00ff3b1abb99e3e011
Searching for VPD83T3:60060160d2a02c00ff3b1abb99e3e011
Storage-volume: VPD83T3:60060160d2a02c00ff3b1abb99e3e011 is in: /clusters/cluster-1/
storage-elements/storage-arrays/EMC-CLARiiON-APM00111402062
```

Alternatively, you could enter the command as:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> find-array --opt_s_vol
VPD83T3:60060160d2a02c00ff3b1abb99e3e011
Searching for VPD83T3:60060160d2a02c00ff3b1abb99e3e011
Storage-volume: VPD83T3:60060160d2a02c00ff3b1abb99e3e011 is in: /clusters/cluster-1/
storage-elements/storage-arrays/EMC-CLARiiON-APM00111402062
```

See also

- `storage-volume claimingwizard`

storage-volume forget

Tells the cluster that a storage volume or a set of storage volumes are physically removed.

Contexts

All contexts.

In `/clusters/`*cluster*`/storage-elements/storage-volumes` context, command is `forget`.

Syntax

```
storage-volume forget
   [-d|--storage-volumes] path [,path...]
```

Arguments

Required arguments	
`[-d|--storage-volumes]` *path*[, *path*...]	* List of one or more storage volumes to forget.

* - argument is positional.

Description

Storage volumes can be remembered even if a cluster is not currently in contact with them. Use this command to tell the cluster that the storage volumes are not coming back and therefore it is safe to forget about them.

You can use the storage-volume forget command only on storage volumes that are unclaimed or unusable, and unreachable.

This command also forgets the logical unit for this storage volume.

Use the `storage-volume forget` command to tell the cluster that unclaimed and unreachable storage volumes are not coming back and it is safe to forget them.

Forgotten storage volumes are removed from the context tree.

Use the `--verbose` argument to print a message for each volume that could not be forgotten.

Use the `logical-unit forget` command for the functionality supported by the removed arguments.

Example

Forget a specified storage volume:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> forget --storage-volume
VPD83T3:6006016021d0250027b925ff60b5de11
```

Forget all unclaimed, unused, and unreachable storage volume on the cluster:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> storage-volume forget *
3 storage-volumes were forgotten.
```

Use the `--verbose` argument to display detailed information while you forget all unclaimed, unused, and unreachable storage volumes on the cluster:

```
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes> storage-volume forget * --
verbose
WARNING: Error forgetting storage-volume 'VPD83T3:600009700001926027735330303053933':
```

```
The 'use' property of storage-volume VPD83T3:60000970000192602773533030353933' is 'meta-
data' but must be 'unclaimed' or 'unusable' before it can be forgotten.
.
.
.
3 storage-volumes were forgotten:
VPD83T3:6006016030802100e405a642ed16e111
.
.
```

See also

- logical-unit forget
- storage-volume unclaim

storage-volume list-banished

Displays banished storage-volumes on a director.

Contexts

All contexts.

In /clusters/*cluster*/storage-elements/storage-volumes context, command is list-banished.

Syntax

```
storage-volume list-banished
   [-n|--director] path
```

Arguments

Required arguments	
[-n|--director] *path*	*The director whose banished storage volumes to display.

Description

Displays the names of storage volumes that are currently banished for a given director.

See "Banished storage volumes (LUNs)" in the storage-volume unbanish command description.

Example

In the following example; director-1-1-A has one banished storage volume:

```
VPlexcli:/> storage-volume list-banished --director director-1-1-A
There is 1 banished storage-volume on director 'director-1-1-A':
Symm0487_0C1B
```

See also

- `storage-volume auto-unbanish-interval`
- `storage-volume unbanish`

storage-volume list-thin-capable

Provides a summary of all thin-capable storage-volumes and determines whether or not the volumes are declared thin (thin-rebuild).

Contexts

All contexts.

Syntax

```
storage-volume list-thin-capable
[-c|--clusters] context path[, context path...]
[-h|--help]
[--verbose]
```

Arguments

Required arguments	
`[-c	--clusters]` *context path*	* Specifies the clusters at which to list the thin-capable storage-volumes.
Optional arguments	
`[-h|--help]`	Displays command line help.
`[--verbose]`	Provides more help during command execution. This may not have any effect for some commands.

* - argument is positional.

Description

Lists all thin-capable storage volumes at the given clusters with an abbreviated list of fields for performance. The fields include: name, thin-rebuild status, capacity, current use, and I/O status. If more fields are desired, use the `--verbose` option.

Example

Displays thin-capable storage volumes for the specified clusters.

```
VPlexcli:/> storage-volume list-thin-capable --clusters cluster-1, cluster-2
cluster-1:
Name                  Thin Rebuild  Capacity  Use      IO Status
--------------------  ------------  --------  -------  ---------
XtremIO0547_LUN_00010 false         10G       used     alive
XtremIO0547_LUN_00009 false         10G       used     alive
XtremIO0547_LUN_00003 false         10G       used     alive
thin_capable_sv_1     false         10G       claimed  alive
thin_capable_sv_2     false         10G       used     alive
XtremIO0547_LUN_00004 false         10G       claimed  alive
```

```
XtremIO0547_LUN_00005   false            10G        claimed  alive
XtremIO0547_LUN_00006   false            10G        claimed  alive
XtremIO0547_LUN_00007   false            10G        claimed  alive
XtremIO0547_LUN_00008   false            10G        claimed  alive

cluster-2:
Name                    Thin Rebuild  Capacity  Use      IO Status
----------------------  ------------  --------  -------  ---------
VPD83T3:514f0c5d8320055e  false          10G        claimed  alive
VPD83T3:514f0c5d83200560  false          10G        claimed  alive
XtremIO0541_LUN_00000   false            10G        claimed  alive
XtremIO0541_LUN_00002   false            10G        claimed  alive
XtremIO0541_LUN_00004   false            10G        claimed  alive
XtremIO0541_LUN_00005   false            10G        claimed  alive
XtremIO0541_LUN_00006   false            10G        claimed  alive
XtremIO0541_LUN_00007   false            10G        claimed  alive
XtremIO0541_LUN_00008   false            10G        claimed  alive
XtremIO0541_LUN_00009   false            10G        claimed  alive
XtremIO0541_LUN_00010   false            10G        claimed  alive



VPlexcli:/>
```

See also

- `virtual-volume list-thin`

storage-volume resurrect

Resurrect the specified storage-volumes.

Contexts

All contexts.

In `/clusters/`*cluster*`/storage-elements/storage-volumes` context, command is `resurrect`.

Syntax

`storage-volume resurrect`

`[-d|--storage-volume]` *path*[, *path*...]

`[-f|--force]`

Arguments

Required arguments	
`[-d|--storage-volume]` *path*[, *path*...]	List of one or more storage volume with dead I/O status to resurrect.
Optional arguments	
`[-f|--force]`	Force the storage-volume resurrect and bypass the test.

Description

Resurrects the specified dead storage volumes and tests the resurrected device before setting its state to healthy.

A storage volume is declared dead:

- After metro node retries a failed I/O to the backend arrays 20 times without success.
- If the storage volume is reachable but errors prevent the I/O from succeeding.

A storage volume declared hardware dead cannot be unclaimed or removed (forgotten). Use this command to resurrect the storage volume. After the storage volume is resurrected, it can be unclaimed and removed.

> ⚠ **CAUTION: Fix the root cause before resurrecting a storage volume because the volume can be successfully resurrected only to go back to dead on the next I/O.**
>
> **This command will not work if the storage volume is marked unreachable.**

This command has no ill effects if issued for a healthy storage volume.

LUNs exported from storage arrays can disappear or display I/O errors for various reasons, including:

- Marked read-only during copies initiated by the storage array
- Unrecoverable device errors
- Snapshot activation or deactivation on the storage array
- An operator shrinks the size of a storage volume, causing metro node to refuse to do I/O to the storage volume.
- 100% allocated thin pools
- Persistent reservation on storage volume
- Dropped frames due to a bad cable or SFP

Dead storage volumes are indicated by one of the following conditions:

- The cluster summary command shows degraded health-state and one or more unhealthy storage volumes. For example:

```
VPlexcli:/clusters/cluster-2/> cluster status
Cluster cluster-2
 operational-status:         ok
 transitioning-indications:
 transitioning-progress:
 health-state:               degraded
 health-indications:         1 unhealthy Devices or storage-volumes
```

- The storage-volume summary command shows the I/O status of the volume as dead. For example:

```
VPlexcli:/> storage-volume summary
SUMMARY (cluster-1)
StorageVolume Name      IO Status  Operational Status  Health State
----------------------  ---------  ------------------  ----------------
dead_volume             dead       error               critical-failure
Symptom:
Storage-volume is dead
```

Examples

Resurrect two storage volumes:

```
VPlexcli:/> storage-volume resurrect --storage-volumes Symm1852_BAC,Symm1852_BA8
```

See also

- cluster status
- storage-volume forget
- storage-volume summary

storage-volume summary

Displays a list of a cluster's storage volumes.

Contexts

All contexts.

In `/clusters/`*`cluster`*`/storage-elements/storage-volumes` context, command is `summary`.

Syntax

`storage-volume summary`

`[-c|--clusters]` *cluster*,[*cluster*]...

Optional arguments	
`[-c|--clusters]` *cluster*,[*cluster*...]	Displays storage volumes for only the specified clusters.

Description

Displays a two-part summary for each cluster's storage volumes:

- I/O status, operational status, and health state for each unhealthy storage volume.
- Summary of health-state, vendor, use, and total capacity for the cluster.

Use the `--clusters` argument to restrict output to only the specified clusters.

If no argument is used, and the command is executed at or below a `/clusters/`*`cluster`* context, output is for the specified *cluster* only.

Otherwise, output is for all clusters.

Table 14. storage-volume summary field descriptions

Field	Description
`Health summary` (displayed only for unhealthy storage volumes)	
`Name`	Name of storage volume.
`I/O Status`	`alive` - I/O is proceeding normally on the storage volume. `dead` - Metro node has marked the storage volume as dead; I/O cannot proceed on the storage volume. This can happen when a certain number of I/Os to the storage volume fails. `unreachable` - The storage volume is unreachable.
`Operational Status`	`ok` - The storage volume is functioning normally. `degraded` - The storage volume may be out-of-date compared to its mirror. (This state applies only to a storage volume that is part of a RAID 1 Metadata Volume.) `unknown` - Metro node cannot determine the storage volume's Operational state, or the state is invalid. `error` - Metro node has marked the storage volume as hardware-dead. `starting` - The storage volume is not yet ready. `lost communication` - The storage volume is unreachable.

Table 14. storage-volume summary field descriptions (continued)

Field	Description
Health State	degraded - The extent may be out-of-date compared to its mirror (applies only to extents that are part of a RAID 1 device).
	ok - The extent is functioning normally.
	non-recoverable-error - The extent may be out-of-date compared to its mirror (applies only to extents that are part of a RAID 1 device), and/or the Health state cannot be determined.
	unknown - Metro node cannot determine the extent's Operational state, or the state is invalid.
	critical failure - Metro node has marked the storage volume as hardware-dead.
Storage-Volume Summary	
out-of-date	Of the total number of storage volumes on the cluster, the number that are out-of-date compared to their mirror.
storage-volumes	Total number of storage volumes on the cluster.
unhealthy	Of the total number of storage volumes on the cluster, the number with health state that is not "ok".
Vendor	Of the total number of storage volumes on the cluster, the number from the specified vendor.
claimed	Of the total number of storage volumes on the cluster, the number that are claimed.
meta-data	Of the total number of storage volumes on the cluster, the number in use as meta-volumes.
unclaimed	Of the total number of storage volumes on the cluster, the number that are unclaimed.
used	Of the total number of storage volumes on the cluster, the number that are in use.
Capacity	Total capacity of all storage on the cluster.
Meta Slots	Total - The total slots used.
	reclaimable - The number of slots that can be reclaimed.
	used - The number of slots that are used.
	storage-volume - The number of slots used for storage volumes.
	extents - The number of slots used for extents.
	logging-segments - The number of slots used for logging segments.

Examples

Display default summary (all clusters) on a metro node with unhealthy volumes:

```
VPlexcli:/> storage-volume summary
SUMMARY (cluster-1)
StorageVolume Name                       IO Status    Operational Status   Health State
---------------------------------------  -----------  -------------------
---------------
Clar0106_LUN14                           alive        degraded             degraded
```

```
Storage-Volume Summary    (no tier)
--------------------      --------------------
Health                    out-of-date        0
                          storage-volumes  363
                          unhealthy          1
Vendor                    DGC              114
                          EMC              248
                          None               1
Use                       meta-data          4
                          unusable           0
                          used             358
Capacity                  total             2T
SUMMARY (cluster-2)
Storage-Volume Summary    (no tier)
--------------------      --------------------
Health                    out-of-date        0
                          storage-volumes  362
                          unhealthy          0
Vendor                    DGC              114
                          EMC              248
Use                       meta-data          4
                          used             358
Capacity                  total          1.99T
```

Display summary for only cluster-1 on a metro node with unhealthy volumes:

```
VPlexcli:/> storage-volume summary --clusters cluster-1
StorageVolume Name    IO Status    Operational Status    Health State
------------------    -----------  ------------------    ----------------
Log1723_154           unreachable  error                 critical-failure
Log1852_154           unreachable  error                 critical-failure
Meta1723_150          unreachable  error                 critical-failure
Meta1852_150          unreachable  error                 critical-failure
Symm1378_0150         unreachable  error                 critical-failure
Symm1378_0154         unreachable  error                 critical-failure
.
.
Storage-Volume Summary    (no tier)
--------------------      --------------------
Health                    out-of-date        0
                          storage-volumes  981
                          unhealthy        966
Vendor                    DGC               15
                          None             966
Use                       claimed          824
                          meta-data          1
                          unclaimed         11
                          unusable         143
                          used               2
Capacity                  total            16T
```

When slot usage reaches 90%, this command also displays the following:

```
Meta Slots                                           total          64000
                          reclaimable       9600
                          used             57600
                          storage-volumes   8000
                          extents          24000
                          logging-segments 25600
```

Display summary for both clusters in a metro node with no unhealthy storage volumes:

```
VPlexcli:/> storage-volume summary
SUMMARY (cluster-1)
Storage-Volume Summary    (no tier)
--------------------      --------------------
Health                    out-of-date        0
                          storage-volumes 2318
                          unhealthy          0
Vendor                    EMC             2318
Use                       claimed         2172
                          meta-data          2
```

```
                           used                144
Capacity                   total               198T
SUMMARY (cluster-2)
Storage-Volume Summary     (no tier)
--------------------       -------------------
Health                     out-of-date           0
                           storage-volumes    2318
                           unhealthy             0
Vendor                     EMC                2318
Use                        claimed            2172
                           meta-data             2
                           used                144
Capacity                   total               198T
```

See also

- `ds summary`
- `ds dd set-log`
- `export port summary`
- `export storage-view summary`
- `extent summary`
- `local-device summary`
- `storage-volume resurrect`
- `virtual-volume provision`

storage-volume unbanish

Unbanishes a storage volume on one or more directors.

Contexts

In `/clusters/`*cluster*`/storage-elements/storage-volumes` context, command is `unbanish.`

All contexts.

Syntax

`storage-volume unbanish`

`[-n|--directors]` *path*[, *path*...]

`[-d|--storage-volume]` *path*

Arguments

Required arguments	
`[-n|--directors]` *path*[, *path*,]...	* The context path of the directors to unbanish the given storage volume on.
Optional arguments	
`[-d|--storage-volume]` *path*	The context path of the storage volume to unbanish. This argument is not required if the current context is a `storage-volume` or below. If the current context is a `storage-volume` or below, it operates on that storage volume.

* - argument is positional.

Description

Metro node examines path state information for LUNs on arrays. If the path state information is inconsistent, metro node banishes the LUN, and makes it inaccessible.

Use this command to unbanish a banished LUN (storage volume).

Banished storage volumes (LUNs)

LUNs (storage volumes) are banished when metro node detects an unexpected configuration of array controllers or paths to arrays. Under normal active/passive operation, one controller for any given LUN is active, the other is passive.

If the path to the active controller fails, the passive path transitions to active. The transition must wait for the failed active controller to drain its pending I/Os. This transient state may be seen during disk replacement, hot sparing, and disk failure.

If the system detects a LUN in this state, it waits 20 seconds for the LUN to return to normal. If the LUN does not return to the expected state, the system banishes the LUN.

Example

In the following example:

- The `list-banished` command shows a volume is banished from director 1-1-A
- The `unbanish` command unbanishes the volume.
- The `list-banished` command shows the change:

```
VPlexcli:/> storage-volume list-banished --director director-1-1-A
There is 1 banished storage-volume on director 'director-1-1-A':
Symm0487_0C1B
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes/Symm0487_0C1B> storage-
volume unbanish --director director-1-1-A
director-1-1-A  Unbanished.
VPlexcli:/clusters/cluster-1/storage-elements/storage-volumes/Symm0487_0C1B> storage-
volume list-banished --director director-1-1-A
There are no banished storage-volumes on director 'director-1-1-A'.
```

See also

- `storage-volume auto-unbanish-interval`
- `storage-volume list-banished`

storage-volume unclaim

Unclaims the specified previously claimed storage volumes.

Contexts

All contexts.

In `/clusters/cluster/storage-elements/storage-volumes` context, command is `unclaim`.

Syntax

```
storage-volume unclaim
[-b|--batch-size] integer
[-d|--storage-volumes] path, [path...]
```

```
[-r|--return-to-pool]
```

Arguments

Required arguments	
`[-d|--storage-volumes]` *path*, [*path*...]	* Specifies the storage volumes to unclaim.
Optional arguments	
`[-b|--batch-size]` *integer*	Specifies the maximum number of storage volumes to unclaim at once.
`[-r|--return-to-pool]`	Returns the storage capacity of each VIAS-based volume to the pool on the corresponding storage-array.

* - argument is positional.

Description

Use the `storage-volume unclaim` command to return the specified storage volumes to the unclaimed state.

The target storage volume must not be in use.

ⓘ **NOTE:** When you use the `storage-volume unclaim` command with VIAS based storage volumes, the command removes the storage volumes from metro node and they are no longer visible. When you use the command with non VIAS based storage volumes, the command marks the storage volumes as unclaimed. This is the intended behavior.

Unclaim a thin storage volume

When a storage volume is unclaimed, the thin-rebuild attribute is set to false.

ⓘ **NOTE:** The thin-rebuild attribute can only be modified for storage volumes that are either claimed or used. When the unclaimed storage volume is claimed and its state is claimed or used, use the `set` command to modify the thin-rebuild attribute.

Example

In the following example:
- The `ll` command in `storage-volumes` context displays storage volumes, including their use state,
- The `storage-volume unclaim` command unclaims two claimed volumes:

```
VPlexcli:/clusters/cluster-2/storage-elements/storage-volumes> ll
```

```
Name                        VPD83 ID                                    Capacity  Use       Vendor  IO      Type        Thin
                                                                                                     Status              Rebuild
-------------------------   ----------------------------------------    --------  --------  ------  ------  ----------  -------
Basic_c1_ramdisk_100GB_684_ VPD83T3:60001440000000103017dfea88355431   100G      claimed   EMC     alive   normal      false
Basic_c1_ramdisk_100GB_685_ VPD83T3:60001440000000103017dfea88355433   100G      claimed   EMC     alive   normal      false
Basic_c1_ramdisk_100GB_686_ VPD83T3:60001440000000103017dfea88355435   100G      claimed   EMC     alive   normal      false
Basic_c1_ramdisk_100GB_687_ VPD83T3:60001440000000103017dfea88355437   100G      claimed   EMC     alive   normal      false
Basic_c1_ramdisk_100GB_688_ VPD83T3:60001440000000103017dfea88355439   100G      claimed   EMC     alive   normal      false
Basic_c1_ramdisk_100GB_689_ VPD83T3:60001440000000103017dfea8835543b   100G      claimed   EMC     alive   normal      false
Basic_c1_ramdisk_100GB_68_  VPD83T3:60001440000000103017dfea88354f61   100G      claimed   EMC     alive   normal      false
Basic_c1_ramdisk_100GB_690_ VPD83T3:60001440000000103017dfea8835543d   100G      claimed   EMC     alive   normal      false
Basic_c1_ramdisk_100GB_691_ VPD83T3:60001440000000103017dfea8835543f   100G      claimed   EMC     alive   normal      false
Basic_c1_ramdisk_100GB_692_ VPD83T3:60001440000000103017dfea88355441   100G      claimed   EMC     alive   normal      false
```

```
VPlexcli:/clusters/cluster-2/storage-elements/storage-volumes> unclaim -d
Basic_c1_ramdisk_100GB_686_ See also
```

storage-volume used-by

Displays the components that use the specified storage volumes.

Contexts

All contexts.

In `/clusters/`*cluster*`/storage-elements/storage-volumes` context, command is `used-by`.

Syntax

```
storage-volume used-by
   [-d|--storage-volumes] path [,path...]
```

Arguments

Required arguments	
`[-d|--storage-volumes]` *path*	* List of one or more storage volumes for which to find users.

Description

To manually deconstruct an encapsulated storage volume, remove each layer starting from the top.

Use the `storage-volume used-by` command to see the layers from the bottom up.

Example

```
VPlexcli:/clusters/cluster-2/storage-elements/storage-volumes> used-by CX4_lun0
/clusters/cluster-1/devices/base0:
   extent_CX4_lun0_1
     CX4_lun0
/clusters/cluster-1/devices/base1:
   extent_CX4_lun0_2
     CX4_lun0
/clusters/cluster-1/devices/base2:
   extent_CX4_lun0_3
     CX4_lun0
/clusters/cluster-1/devices/base3:
   extent_CX4_lun0_4
     CX4_lun0
/clusters/cluster-1/storage-elements/extents/extent_CX4_lun0_5:
   CX4_lun0
/clusters/cluster-1/storage-elements/extents/extent_CX4_lun0_6:
   CX4_lun0
```

syrcollect

Collects system configuration data for System Reporting (SYR).

Contexts

All contexts.

Syntax

```
syrcollect
   [-d|--directory]  directory
```

Arguments

Optional arguments	
`[-d|--directory]` *directory*	Non-default directory in which to store the output. Files saved in the non-default directory are not automatically sent to Dell EMC. ● Default: Files are stored in the Event_Msg_Folder in the directory specified in the `EmaAdaptorConfig.properties` file. ● `EmaAdaptorConfig.properties` and the `Event_Msg_Folder` are located in `/opt/emc/VPlex` on the management server. ● Files in the default directory are automatically sent to Dell EMC.

Description

Manually starts a collection of SYR data, and optionally sends the resulting zip file to Dell EMC.

Run this command after every major configuration change or upgrade.

Data collected includes:

● Metro node information
● Cluster information
● Engine/chassis information
● RAID information
● Port information
● Back end storage information

The output of the command is a zipped xml file named:

*VPLEXTLA*_Config_*TimeStamp*.zip.

in the specified output directory.

Files in the default directory are automatically sent to Dell EMC.

Use the `--directory` argument to specify a non-default directory. Output files sent to a non-default directory are not automatically sent to Dell EMC.

Example

Start an SYR data collection, and send the output to Dell EMC:

```
VPlexcli:/> syrcollect
```

Start an SYR data collection, and send the output to the specified directory:

```
VPlexcli:/> syrcollect -d /var/log/VPlex/cli
```

See also

● `scheduleSYR add`
● `scheduleSYR list`
● `scheduleSYR remove`

tree

Displays the context tree.

Contexts

All contexts.

Syntax

```
tree
        [-e|--expand]
        [-c|--context] subcontext-root
        [-s|--select] glob-pattern
```

Arguments

Optional arguments	
`[-e|--expand]`	Expand the subcontexts.
`[-c|--context]` *subcontext-root*	The subcontext to use as the root for the tree.
`[-s|--select]` *glob-pattern*	Glob pattern for selecting the contexts in the tree.

Description

Displays the sub-context tree.

Use the `tree` command with no arguments to display the sub context tree from the current context.

Use the `--context` subcontext root to display the sub context tree from the specified subcontext.

Use the `--expand` argument to expand the sub-contexts if applicable.

Use the `--select` *glob-pattern* argument to display contexts in the specified sub-tree that match the glob pattern. The glob pattern may match more contexts that are outside the given sub-tree.

Examples

Display contexts below the current context:

```
VPlexcli:/management-server> tree
/management-server:
    ports
      eth0
      eth1
      eth2
      eth3
```

Display contexts below the specified context:

```
VPlexcli:/> tree --context /clusters/cluster-1/devices/dev_sym1723_1FC
/clusters/cluster-1/devices/dev_sym1723_1FC:
    components
      extent_Symm1723_1FC_1
        components
          Symm1723_1FC
            components
```

See also

- `drill-down`
- `set`

unalias

Removes a command alias.

Contexts

All contexts.

Syntax

```
unalias
        [-n|--name] name
        [-a|--all]
```

Arguments

Optional arguments	
`[-n|--name]` *name*	The name of the alias to remove.
`[-a|--all]`	Remove all defined aliases.

Example

In the following example:

- `alias` displays a list of all aliases on the metro node
- `unalias` deletes the specified alias
- `alias` confirms the deletion

```
VPlexcli:/> alias
Name            Description
------------    -------------------------------------------
?               Substitutes the 'help' command.
GoToDir_2_2A    Substitutes the 'cd
                /clusters/cluster-1/directors/Cluster_2_Dir_2A' command.
ll              Substitutes the 'ls -al' command.
quit            Substitutes the 'exit' command.
VPlexcli:/> unalias GoToDir_2_2A
VPlexcli:/> alias
Name   Description
----   ------------------------------
?      Substitutes the 'help' command.
ll     Substitutes the 'ls -al' command.
quit   Substitutes the 'exit' command.
```

See also

- `alias`

validate-system-configuration

Performs a basic system configuration check.

Contexts

All contexts.

Syntax

```
validate-system-configuration
```

Description

This command performs the following checks:

- Validates cache mirroring.
- Validates the logging volume.
- Validates the meta-volume.
- Validates back-end connectivity.

Examples

Validate system configuration:

```
VPlexcli:/> validate-system-configuration
Validate cache replication
Checking cluster cluster-1 ...
rmg component not found skipping the validation of cache replication.
ok
Validate logging volume
No errors found
ok
Validate back-end connectivity
Cluster cluster-2
    0 storage-volumes which are dead or unreachable.
    0 storage-volumes which do not meet the high availability requirement for storage
volume paths*.
     0 storage-volumes which are not visible from all directors.
*To meet the high availability requirement for storage volume paths each storage volume
must be accessible from each of the directors through 2 or more VPlex backend ports, and
2 or more Array target ports, and there should be 2 or more ITLs.
Cluster cluster-1
    10 storage-volumes which are dead or unreachable.
    0 storage-volumes which do not meet the high availability requirement for storage
volume paths*.
     0 storage-volumes which are not visible from all directors.
*To meet the high availability requirement for storage volume paths each storage volume
must be accessible from each of the directors through 2 or more VPlex backend ports, and
2 or more Array target ports, and there should be 2 or more ITLs.
Errors were encountered in the back-end connectivity.  Please run 'connectivity validate-
be -d' for details.
Validate meta-volume
Checking cluster cluster-1 ...
Checking cluster cluster-2 ...
ok
```

See also

- `cluster status`
- `connectivity validate-be`
- `health-check`

version

Display version information for connected directors.

Contexts

All contexts.

Syntax

```
version
       [-a|--all]
    [-n|directors] context-path,context-path...
       [--verbose]
```

Arguments

Optional arguments	
`[-a|--all]`	Displays version information for all connected directors.
`[-n|--directors]` *context-path*	* Display version information for only the specified directors.
`--verbose`	Displays version information for individual software components on each director.

* - argument is positional.

Description

This command displays version information for all directors, a specified director, or individual software components for each director.

Table 15. Software components

Component Abbreviation	Description
`Product Version`	Metro node version information.
`Mgmt Server Base`	Novel Linux distribution.
`Mgmt Server Software`	Version of the software on the management server.
`Director Operating System`	Novell Linux distribution.
`Cluster Witness Server Software`	Version of the Cluster Witness Sever VM.
`OS`	Operating system running on the director.
`Director Software`	Version of the software on the specified director.
`NSFW`	Metro node software. Metro node operating system running in the clusters.

Table 15. Software components (continued)

Component Abbreviation	Description
FW Bundle Rev	Firmware revision.
POST Rev	Power On Self Test revision.
BIOS Rev	Boot firmware revision.
SSD Model	Solid state disk drive model information.

Examples

Display management server/SMS version information:

```
VPlexcli:/> version -a
What Version Info
------------------- ------------- ----
Product Version 7.0.0.00.00.47 -
SMSv2 170.0.0.291.0 -
Mgmt Server Base 170.0.0.201 -
Mgmt Server Software 170.0.0.385 -
director-1-1-A 170.0.0.385.0 -
director-2-1-A 170.0.0.385.0 -
director-1-1-B 170.0.0.385.0 -
director-2-1-B 170.0.0.385.0 -
```

Display management server/SMS version and version for the specified director:

```
VPlexcli:/> version director-2-1-B
What                                        Version        Info
------------------------------------------- -------------- ----
Product Version                             5.4.0.00.00.10 -
SMSv2                                       D35.20.0.10.0  -
Mgmt Server Base                            D35.20.0.1     -
Mgmt Server Software                        D35.20.0.13    -
/clusters/cluster-2/directors/director-2-1-B 6.5.54.0.0    -
```

Display version information for management server, SMS, and all directors:

```
VPlexcli:/> version -a
What                                        Version        Info
------------------------------------------- -------------- ----
Product Version                             5.4.0.00.00.10 -
SMSv2                                       D35.20.0.10.0  -
Mgmt Server Base                            D35.20.0.1     -
Mgmt Server Software                        D35.20.0.13    -
/clusters/cluster-2/directors/director-2-1-B 6.5.54.0.0    -
/clusters/cluster-2/directors/director-2-1-A 6.5.54.0.0    -
/clusters/cluster-1/directors/director-1-1-B 6.5.54.0.0    -
/clusters/cluster-1/directors/director-1-1-A 6.5.54.0.0    -
```

Display version information for individual software components on each director. See Software components table below for a description of the components.

```
VPlexcli:/> version -a --verbose
Product Version:  5.4.0.00.00.10
What:           SMSv2
Version:        D35.20.0.10.0
Build time:     June 09, 2014 at 11:38:36PM EDT
Build machine:  dudleyed05
Build OS:       Linux version 2.6.27-7-generic on amd64
Build compiler: 1.6.0_45
Build source:   /spgear/spgear_misc/htdocs/harness/release/1795/work/ui/src
What:      Mgmt Server Base
Version:   D35.20.0.1
What:      Mgmt Server Software
Version:   D35.20.0.13
```

```
For director /engines/engine-2-1/directors/director-2-1-B:
What:    O/S
Version: D35.20.0.1 (SLES11)
What:    Director Software
Version: 6.5.54.0.0
What:    ECOM
Version: 6.5.1.0.0-0
What:    VPLEX Splitter
Version: 4.1.b_vplex_D35_00_Ottawa_MR1.10-1
What:    ZECL
Version: 6.5.52.0.0-0
What:    ZPEM
Version: 6.5.52.0.0-0
What:    NSFW
Version: 65.1.54.0-0
What:    BIOS Rev
Version: 08.50
What:    POST Rev
Version: 43.80
What:    FW Bundle Rev
Version: 12.60
What:    SSD Model: P30056-MTFDBAA056SAL 118032803
Version: 0005
For director /engines/engine-2-1/directors/director-2-1-A:
What:    O/S
Version: D35.20.0.1 (SLES11)
What:    Director Software
Version: 6.5.54.0.0
What:    ECOM
Version: 6.5.1.0.0-0
What:    VPLEX Splitter
Version: 4.1.b_vplex_D35_00_Ottawa_MR1.10-1
What:    ZECL
Version: 6.5.52.0.0-0
What:    ZPEM
Version: 6.5.52.0.0-0
What:    NSFW
Version: 65.1.54.0-0
What:    BIOS Rev
Version: 08.50
What:    POST Rev
Version: 43.80
What:    FW Bundle Rev
Version: 12.60
What:    SSD Model: P30056-MTFDBAA056SAL 118032803
Version: 0005
For director /clusters/cluster-1/directors/director-1-1-B:
What:    O/S
Version: D35.20.0.1 (SLES11)
What:    Director Software
Version: 6.5.54.0.0
What:    ECOM
Version: 6.5.1.0.0-0
What:    VPLEX Splitter
Version: 4.1.b_vplex_D35_00_Ottawa_MR1.10-1
What:    ZECL
Version: 6.5.52.0.0-0
What:    ZPEM
Version: 6.5.52.0.0-0
What:    NSFW
Version: 65.1.54.0-0
What:    BIOS Rev
Version: 08.50
What:    POST Rev
Version: 43.80
What:    FW Bundle Rev
Version: 12.60
What:    SSD Model: P30056-MTFDBAA056SAL 118032803
Version: 0005
For director /clusters/cluster-1/directors/director-1-1-A:
What:    O/S
Version: D35.20.0.1 (SLES11)
What:    Director Software
```

```
Version:   6.5.54.0.0
What:      ECOM
Version:   6.5.1.0.0-0
What:      VPLEX Splitter
Version:   4.1.b_vplex_D35_00_Ottawa_MR1.10-1
What:      ZECL
Version:   6.5.52.0.0-0
What:      ZPEM
Version:   6.5.52.0.0-0
What:      NSFW
Version:   65.1.54.0-0
What:      BIOS Rev
Version:   08.50
What:      POST Rev
Version:   43.80
What:      FW Bundle Rev
Version:   12.60
What:      SSD Model: P30056-MTFDBAA056SAL 118032803
Version:   0005
```

virtual-volume create

Creates a virtual volume on a host device.

Contexts

All contexts.

Syntax

```
virtual-volume create
  [-r|--device] context-path
  [-t|--set-tier] tier
  [-n | --thin]
  [-i | --initialize]
  [--confirm-init]
  [--verbose]
```

Arguments

Required arguments	
[-r	--device] *context-path*	* Device on which to host the virtual volume.
Optional arguments	
[-t	--set-tier] *tier*	Set the storage-tier for the new virtual volume.
[-n	--thin]	Specifies whether to create a thin-enabled virtual volume or not.
[-i	--initialize]	Initializes the virtual volume by erasing 10 MB of the initial storage blocks. This prevents the virtual volume from retaining old or stale data. This must be used along with the `confirm-init` option.
[--confirm-init]	Confirms the initialization process on the virtual volume. This must be used along with the `initialize` option.

* - argument is positional.

Description

A virtual volume is created on a device or a distributed device, and is presented to a host through a storage view. Virtual volumes are created on top-level devices only, and always use the full capacity of the device or distributed device.

The underlying storage of a virtual volume may be distributed over multiple storage volumes, but appears as a single contiguous volume.

The specified device must not already have a virtual volume and must not have a parent device.

Use the `--set-tier` argument to set the storage tier for the new virtual volume.

Table 16. virtual-volume field descriptions

Field	Description
block count	The number of blocks in the volume.
block size	The size of a single block, in kilobytes.
cache-mode	Synchronous (write-through).
capacity	The total number of bytes in the volume. Equals the `block-size` multiplied by the `block-count`. ⓘ **NOTE:** The capacity of a virtual volume on which the initialization process has failed will be 0.
thin-capable	Determines whether the virtual volume is thin-capable or not.
thin-enabled	Determines whether the virtual volume is configured as thin-enabled.
consistency-group	The name of the consistency group to which this volume belongs, if any.
expandable-capacity	Excess capacity not yet exposed to the host by the virtual volume. This capacity is available for expanding the virtual volume. ● Zero (0) - Expansion is not supported on the virtual volume or that there is no capacity available for expansion. ● Non-zero - The capacity available for virtual volume expansion using the storage-volume method.
expansion-method	The expansion method that can be used to expand the virtual volume. ● `concatenation` - The virtual volume can be expanded only by adding the specified extents. ● `not-supported` - The virtual volume cannot be expanded. ● `storage-volume` - The virtual volume can be expanded using storage array based volume expansion or by migrating to a larger device.
expansion-status	Expansion status for the volume. ● – - None of the other expansion states apply. No operation is blocked by this state. ● `failed` - An expansion has failed. The expansion has failed and the expansion must be re-tried. If the expansion is not retried this state will persist for up-to 2 days. See health-indications for more information. ● When an expansion fails, the overall health, operational-status, or service-status of the virtual-volume is not degraded. ● `in-progress` - An expansion has been started, but has not completed. The following operations are blocked on the volume: additional expansion, migration, and NDU.

Table 16. virtual-volume field descriptions (continued)

Field	Description
	● `unknown` - Metro node could not determine the expansion status of the volume.
`health-indications`	Indicates the reasons for: ● A health-state that is not 'ok' ● The reasons for the failure of virtual volume expansion or initialization.
`health state`	● `major failure` - One or more of the virtual volume's underlying devices is out-of-date, but will never rebuild. ● `minor failure` - One or more of the virtual volume's underlying devices is out-of-date, but will rebuild. ● `non-recoverable error` - Metro node cannot determine the virtual volume's Health state. ● `ok` - The virtual volume is functioning normally. ● `unknown` -Metro node cannot determine the virtual volume's Health state, or the state is invalid.
`initialization-status`	Status of the initialization process on the virtual volume. ● `success` - Indicates that the initialization process is completed successfully. ● `failed` - Indicates that the initialization process is failed. ● `in-progress` - Indicates that the initialization process is in progress. ● `unknown` - Indicates that the initialization process remains in a status other than `success`, `failed`, or `in-progress`. ⓘ **NOTE:** If initialization is requested during the creation of the virtual volume, you must wait until the initialization process is completed successfully to use the virtual volume. If the initialization process fails, restart the process by using the `virtual-volume re-initialize` command.
`locality`	● `local` - The virtual volume relies completely on storage at its containing cluster. ● `remote` - The virtual volume is a proxy for a volume whose storage resides at a different cluster. I/O to a remote virtual volume travels between clusters. ● `distributed` - The virtual volume is the cluster-local representation of a distributed RAID-1. Writes to a distributed volume travels to all the clusters at which it has storage; reads come, if possible, from the local leg.
`operational status`	● `degraded` - The virtual volume may have one or more out-of-date devices that will eventually rebuild. ● `error` - One or more of the virtual volume's underlying devices is hardware-dead. ● `ok` - The virtual volume is functioning normally. ● `starting` -The virtual volume is not yet ready. ● `stressed` - One or more of the virtual volume's underlying devices is out-of-date and will never rebuild. ● `unknown` - Metro node cannot determine the virtual volume's Operational state, or the state is invalid.
`scsi-release-delay`	A SCSI release delay time in milliseconds. Optimum value is 0 to 2 seconds. Setting a very high value could break the SCSI semantics. If another reserve arrives at this cluster within this

Table 16. virtual-volume field descriptions (continued)

Field	Description
	time frame, neither release nor reserve will be sent across the WAN.
`service-status`	The service status of a virtual-volume. ● `running` - I/O is running for the virtual-volume. ● `inactive` - The virtual-volume is part of an inactive storage-view and is not visible from the host. ● `unexported` - The virtual-volume is unexported. ● `suspended` - I/O is suspended for the virtual-volume. ● `cluster-unreachable` - Cluster is unreachable at this time. ● `need-resume` - Issue re-attach to resume after link has returned.
`storage-array-family`	The family of the storage array from which the virtual volume was created.
`storage-tier`	The storage-tier for the virtual volume.
`supporting-device`	The local, remote, or distributed device underlying this virtual volume.
`system-id`	The internal system ID for the storage.
`volume-type`	Always virtual-volume.
`vpd-id`	The VPD identifier for the virtual volume.

About storage tier IDs

The storage-tier identifier is displayed to the host as part of the virtual volumes's product ID.

Use the storage-tier identifier to logically group storage.

For example, assign Symmetrix arrays as tier 1 storage, and CLARiiON as tier 2 storage.

Use the `ll` command in a specific virtual volume's context to display the current storage-tier.

Use the `set` command to modify a virtual volume's storage-tier.

Examples

In the following example:

● The `virtual-volume create` command creates a new virtual volume,
● The `cd` command navigates to the new virtual volume's context,
● The `ll` command displays the new virtual volume:

```
VPlexcli:/> virtual-volume create --device /distributed-storage/distributed-devices/
r0_C1_VATS_00001_vol


VPlexcli:/clusters/cluster-1/virtual-volumes> cd r0_C1_VATS_00001_vol
VPlexcli:/clusters/cluster-1/virtual-volumes/r0_C1_VATS_00001_vol> ll
Name                            Value
------------------------------  ---------------------------------------
block-count                     20971520
block-size                      4K
cache-mode                      synchronous
capacity                        80G
consistency-group               -
expandable                      true
expandable-capacity             0B
```

```
expansion-method          storage-volume
expansion-status          -
health-indications        []
health-state              ok
initialization-status     success
locality                  local
operational-status        ok
scsi-release-delay        0
service-status            unexported
storage-array-family      clariion
storage-tier              -
supporting-device         r0_C1_VATS_00001
system-id                 r0_C1_VATS_00001_vol
thin-capable              false
thin-enabled              unavailable
volume-type               virtual-volume
vpd-id                    VPD83T3:6000144000000010200ecb6260b7ac42


VPlexcli:/clusters/cluster-1/virtual-volumes/r0_C1_VATS_00001_vol>
```

See Also

- `virtual-volume destroy`
- `virtual-volume expand`
- `virtual-volume provision`
- `virtual-volume reinitialize`

virtual-volume destroy

Destroys existing virtual volumes.

Contexts

All contexts.

Syntax

```
virtual-volume destroy
        [-v|--virtual-volumes] context-path,context-path...
        [-f|--force]
```

Arguments

Required arguments	
[-v|--virtual-volumes] *context-path, context-path...*	List of one or more virtual volumes to destroy. Entries must be separated by commas. The specified virtual volumes must not be exported to hosts.
Optional arguments	
[-f|--force]	Forces the destruction of the virtual volumes without asking for confirmation. Allows this command to be run from non-interactive scripts.

Description

Deletes the virtual volume and leaves the underlying structure intact. The data on the volume is no longer accessible.

Only unexported virtual volumes can be deleted. To delete an exported virtual volume, first remove the volume from the storage view.

Examples

```
VPlexcli:/clusters/cluster-1> virtual-volume destroy -v was_1_leg_r1_vol/
WARNING: The following items will be destroyed:
Context
------------------------------------------------------
/clusters/cluster-1/virtual-volumes/was_1_leg_r1_vol
Do you wish to proceed? (Yes/No) y
```

See also

- virtual-volume create
- virtual-volume expand

virtual-volume expand

Non-disruptively increases the capacity of an existing virtual volume.

Contexts

All contexts.

In clusters/*cluster*/virtual-volumes/ context and below, command is expand.

Syntax

```
virtual-volume expand
        [-v|--virtual-volume] context-path
        [-e|--extent] extent
        [-f|--force]
```

Arguments

Required arguments	
[-v|--virtual-volume] context-path	* The virtual volume to expand. ● For both storage volume and concatenation methods of expansion, the virtual volume must be expandable, and have a geometry of RAID 1, RAID C, or RAID 0. ● For storage-volume expansions, the virtual volume must be expandable, and have a geometry of RAID 1, RAID C, RAID 0, or DR1.
Optional arguments	
[-e|--extent] extent	* The target local device or extent to add to the virtual volume using the concatenation method of expansion. The local device or extent must not have a virtual volume on top of it.

`[-f|--force]`	The meaning of this argument varies, depending on whether the `--extent` argument is used (expansion method = concatenation) or not used (expansion-method = storage-volume)
	● For storage-volume expansion, the `--force` argument skips the confirmation message.
	● For concatenation expansion, the `--force` argument expands a virtual volume built on a RAID 1 device using a target that is not a RAID 1 or that is not as redundant as the device supporting the virtual volume.

* - argument is positional.

Description

This command expands the specified virtual volume using one of two methods; storage-volume or concatenation.

The `ll` command output shows whether the volume is expandable, the expandable capacity (if any), and the expansion method available for the volume. For example:

```
VPlexcli:> ll /clusters/cluster-1/virtual-volumes/ Test_volume
Name                Value
------------------  --------------
.
.
.
capacity            0.5G
consistency-group   -
expandable          true
expandable-capacity 4.5G
expansion-method    storage-volume
expansion-status    -
.
.
.
```

There are two methods to expand a virtual volume; storage-volume and concatenation.

● storage-volume - If the virtual volume has a non-zero expandable-capacity, this command will expand the capacity of the virtual volume by it's full expandable-capacity.

  To use the storage-volume method of expansion, use this command without the `--extent` argument. The storage-volume method of expansion adds the entire amount of the expandable-capacity to the volume's configured capacity.

● concatenation - (also known as RAID C expansion) Expand the virtual volume by adding the specified extents or devices.

  The concatenation method does not support non-disruptive expansion of DR1 devices.

  Use this command with the `--extent` argument to expand a virtual volume using the concatenation method of expansion.

ⓘ **NOTE:** You cannot expand a virtual volume if the initialization status of the virtual volume is `failed` or `in-progress`.

Before expanding a storage volume, understand the limitations of the function and the prerequisites required for volumes to be expanded. See the *Dell EMC Administration Guide for metro node* for more information on how expansion works. For procedure to expand virtual volumes, see the metro node procedures in the SolVe Desktop.

Examples

Expand a volume using the storage-volume method:

● The `ll clusters/cluster-1/virtual-volumes` command displays virtual volumes, and whether the volumes are expandable, and the expandable capacity, if any (not all columns are shown in example).
● The `ll clusters/cluster-1/virtual-volumes/`*virtual-volume* command displays the method (storage-volume) of expansion applicable to the volume.
● The `expand` command starts the expansion of the specified virtual volume.
● The `ll clusters/cluster-1/virtual-volumes` command displays the expanded volume:

```
VPlexcli:/clusters/cluster-1/virtual-volumes> ll /clusters/cluster-1/virtual-volumes
/clusters/cluster-1/virtual-volumes:
```

```
Name                ...Capacity  Locality  Supporting  Cache        Expandable
Expandable ...
                    ...                     Device      Mode                     Capacity   ...
----------------    ...--------   --------  ----------  ----------   ------------
---------- ...
Raid0_1Ga_11_vol    ...5G         local     raid1-dev   synchronous  true         4.5G
RaidC_1Gb_11_vol    ...5G         local     raid1-dev   synchronous  true         0B
Test_volume         ...0.5G       local     Test        synchronous  true         4.5G
.
.
.
VPlexcli:/clusters/cluster-1/virtual-volumes> ll /clusters/cluster-1/virtual-volumes/
Test_volume
Name                Value
------------------  ---------------
block-count         131072
block-size          4K
cache-mode          synchronous
capacity            0.5G
consistency-group   -
expandable          true
expandable-capacity 4.5G
expansion-method    storage-volume
expansion-status    -
.
.
.
VPlexcli:/clusters/cluster-1/virtual-volumes> expand -v Test_volume/
Virtual Volume expansion can take some time and once started, cannot be cancelled.
Some operations such as upgrades and data migrations will not be possible during the
expansion.  In some cases hosts and their applications may need to be restarted once
the expansion has completed.  Do you wish to proceed ? (Yes/No) yes
The expansion of virtual-volume 'Test_volume' has started.
VPlexcli:/clusters/cluster-1/virtual-volumes> cd Test_volume/
VPlexcli:/clusters/cluster-1/virtual-volumes/Test_volume> ll
Name                Value
------------------  ---------------
block-count         131072
block-size          4K
cache-mode          synchronous
capacity            0.5G
consistency-group   -
expandable          true
expandable-capacity 4.5G
expansion-method    storage-volume
expansion-status    in-progress
health-indications  []
.
.
.
VPlexcli:/clusters/cluster-1/virtual-volumes> ll /clusters/cluster-1/virtual-volumes
/clusters/cluster-1/virtual-volumes:
Name                ...Capacity  Locality  Supporting  Cache        Expandable
Expandable ...
                    ...                     Device      Mode                     Capacity   ...
----------------    ...---------  --------  ----------  ----------   ------------
---------- ...
Raid0_1Ga_11_vol    ...5G         local     raid1-dev   synchronous  true         4.5G
RaidC_1Gb_11_vol    ...5G         local     raid1-dev   synchronous  true         0B
Test_volume         ...5G         local     Test        synchronous  true         0B
.
.
.
```

Expand a virtual volume using the concatenation method:

- The `ll clusters/cluster-1/virtual-volumes` command displays the available virtual volumes, and whether the volumes are expandable.
- The `ll clusters/cluster-1/virtual-volumes/volume-name` command displays that the concatenation method must be used to expand the target volume.
- The `ll /clusters/cluster-1/storage-elements/extents` command displays available extents.

- The `virtual-volume expand --virtual-volume` *virtual-volume* `--extent` *extent* command adds the specified extent to the specified virtual volume:

```
VPlexcli:/> ll /clusters/cluster-1/virtual-volumes
/clusters/cluster-1/virtual-volumes:
Name               Operational  Health  ... ...  Expandable
-----------------  Status       State   ... ...  ----------
-----------------  -----------  ------  ... ...  ----------
Raid0_1Ga_11_vol   ok           ok      ... ...  true
RaidC_1Gb_11_vol   ok           ok      ... ...  true
Raid1_1Gc_11_vol   ok           ok      ... ...  true
Test-Device_vol    ok           ok      ... ...  true
.
.
.
VPlexcli:/> ll /clusters/cluster-1/virtual-volumes/Test-Device-vol
Name               Value
-----------------  -------------------------------
.
.
.
expandable         true
expansion-method   concatenation
health-indications []
.
.
.
VPlexcli:/> ll /clusters/cluster-1/storage-elements/extents
/clusters/cluster-1/storage-elements/extents:
Name                                StorageVolume             Capacity  Use
----------------------------------  ----------------------    --------  -------
extent_Symm1554Tdev_061D_1          Symm1554Tdev_061D         100G      used
extent_Symm1554Tdev_0624_1          Symm1554Tdev_0624         100G      used
extent_Symm1554Tdev_0625_1          Symm1554Tdev_0625         100G      used
extent_Symm1554_0690_1              Symm1554_0690             8.43G     used
extent_Symm1554_0691_1              Symm1554_0691             8.43G     used
extent_Symm1554_0692_1              Symm1554_0692             8.43G     used
.
.
.
VPlexcli:/> cd /clusters/cluster-1/virtual-volumes/Test-Device_vol
VPlexcli:/clusters/cluster-1/virtual-volumes/Test-Device_vol> expand --virtual-volume
Test-Device_vol --extent ext_Symm1254_7BF_1
```

See also

- `batch-migrate pause`
- `batch-migrate resume`
- `dm migration pause`
- `dm migration resume`
- `virtual-volume create`
- `virtual-volume destroy`
- *Dell EMC Administration Guide for metro node*

virtual-volume list-thin

Lists the virtual volumes at the given clusters with additional thin-property filtering options.

Contexts

All contexts.

Syntax

```
virtual-volume list-thin
-t | --clusters context path
-e | --enabled true|false
-c | --capable true|false
[--verbose]
```

Arguments

Required arguments	
-t	--clusters *context path*	* The target cluster where virtual volumes are listed.
Optional arguments	
-e	--enabled *true|false*	Filters volumes with the matching thin-enabled value. The value can be true or false. If omitted, the results will match volumes regardless of whether they are thin-enabled or not.
-c	--capable *true|false*	Filters volumes with the matching thin-capable value. The value can be true or false. If omitted, the results will match volumes regardless of whether they are thin-capable or not.
[-h|--help]	Displays command line help.
[--verbose]	Provides more help during command execution. This may not have any effect for some commands.

* - argument is positional.

Description

This command lists virtual volumes at the given clusters with additional thin-property filtering options.

The following table describes the filter combinations, and the results that are listed.

Thin-capable	Thin-enabled	Results
True	true	Volumes that are both thin-capable and thin-enabled.
False	unavailable	Volumes that are thin-enabled, but not thin-capable. This is true only for thin-to-thin or thin-to-thick migrations.
True	disabled	Volumes that are thin-capable, but not thin-enabled.
False	unavailable	Thick volumes. Neither thin-capable nor thin-enabled.
Unspecified?	unavailable	All volumes that are not thin-enabled.
False	unavailable	All volumes that are not thin-capable (enabled or not).

See also

```
storage-volume list-thin-capable
```

virtual-volume re-initialize

Restarts the initialization process on a virtual volume.

Contexts

All contexts.

Syntax

```
virtual-volume re-initialize
    [-v | --virtual-volume] virtual-volume
  [--verbose]
```

Arguments

Required arguments	
[-v	--virtual-volume] *virtual-volume*	* The virtual-volume that you want to reinitialize.
Optional arguments	
[-h|--help]	Displays command line help.
[--verbose]	Provides more output during command execution. This may not have any effect for some commands.

* - argument is positional.

Description

This command restarts a failed initialization process on a virtual-volume. The command runs only if the `initialization-status` field of the virtual volume shows `failed`.

See Also

- `virtual-volume create`
- `virtual-volume destroy`
- `virtual-volume expand`
- `virtual-volume provision`

virtual-volume set-thin-enabled

Sets the thin-enabled property to either true or false for the given virtual volumes.

Contexts

All contexts.

Syntax

```
virtual-volume set-thin-enabled
-v | --virtual-volumes context path [, context path...]
-t | --thin-enabled arg
[-h|--help]
[--verbose]
```

Arguments

Required arguments	
-t | --thin-enabled *arg*	Specifies the desired value of the thin-enabled property.
-v | --virtual-volumes *context path* [, *context path*...]	* Specifies the virtual volumes for which the thin-enabled property must be set.
Optional arguments	
[-h|--help]	Displays command line help.
[--verbose]	Provides more help during command execution. This may not have any effect for some commands.

* - argument is positional.

Description

This command sets the thin-enabled property to either true or false for the given virtual volumes. Virtual volumes can be specified as a parameter, using globbing or wildcards.

The `virtual-volume set-thin-enabled` command does not fail even if virtual volumes are not thin-capable. Virtual volumes that are not thin-capable are skipped. For brevity of the user messages, the regular output of this command only includes:

- the number of volumes that are set as thin-enabled (or not set)
- the number of volumes that are skipped

If you want detailed output showing exactly which volumes are set as thin-enabled or skipped, use the `--verbose` option. However, the output can be very long.

Example

Displays all the virtual volumes that are set as thin-enabled, or are skipped.

```
VPlexcli:/> virtual-volume set-thin-enabled true --virtual-volumes /clusters/
cluster-1/** --verbose

Virtual-volumes that were set thin-enabled:
thin_vol_1, thin_vol_2

Virtual-volumes that were skipped because they are either already thin-enabled or not
thin-capable:
thick_vol_1, thick_vol_2

VPlexcli:/>
```

See also

virtual-volume summary

Displays a summary for all virtual volumes.

Contexts

All contexts.

In /clusters/cluster-*n*/virtual-volumes context, command is summary.

Syntax

```
virtual-volume summary
        [-c|--clusters] cluster,cluster
```

Arguments

Optional arguments	
[-c|--clusters] *cluster*	List of one or more names of clusters. Display information for only the specified clusters. Entries must be separated by commas.

Description

Displays a list of any devices with a health-state or operational-status other than ok.

Displays a summary including devices per locality (distributed versus local), cache-mode, and total capacity for the cluster.

Displays any volumes with an expandable capacity greater than 0, and whether an expansion is in progress.

If the --clusters argument is not specified and the command is executed at or below a /clusters/cluster context, information is displayed for the current cluster.

Otherwise, virtual volumes of all clusters are summarized.

Table 17. virtual-volume summary field descriptions

Field	Description
Virtual-volume health summary (displayed only for unhealthy volumes)	
volume name	Name of the virtual volume.
health state	- major failure - One or more of the virtual volume's underlying devices is out-of-date, but will never rebuild. - minor failure - One or more of the virtual volume's underlying devices is out-of-date, but will rebuild. - non-recoverable error - Metro node cannot determine the virtual volume's Health state. - ok - The virtual volume is functioning normally. - unknown -Metro node cannot determine the virtual volume's Health state, or the state is invalid.

Table 17. virtual-volume summary field descriptions (continued)

Field	Description
operational status	• degraded - The virtual volume may have one or more out-of-date devices that will eventually rebuild. • error - One or more of the virtual volume's underlying devices is hardware-dead. • ok - The virtual volume is functioning normally. • starting -The virtual volume is not yet ready. • stressed - One or more of the virtual volume's underlying devices is out-of-date and will never rebuild. • unknown - Metro node cannot determine the virtual volume's Operational state, or the state is invalid.
service status	The service status of a virtual-volume. • running - I/O is running for the virtual-volume. • inactive - The virtual-volume is part of an inactive storage-view and is not visible from the host. • unexported The virtual-volume is unexported. • suspended - I/O is suspended for the virtual-volume. • cluster-unreachable - Cluster is unreachable at this time. • need-resume - Issue re-attach to resume after link has returned. • disconnected - Applies in production failure scenarios. It will clear after production failback is complete.
Summaries	
Total	Total number of virtual volumes on the cluster, and number of unhealthy virtual volumes.
Locality summary	distributed - Number of distributed virtual volumes. • local - Number of local virtual volumes. • remote - Number of remote volumes.
Cache-mode summary	synchronous - Number of virtual volumes with synchronous cache mode.
Expansion summary	• virtual-volume name - Name of any volume with expandable capacity greater than 0 or an expansion underway. • expandable-capacity - Additional capacity (if any) added to the back end storage volume not yet added to the metro node virtual volume. • capacity - Current capacity of the virtual volume. • expansion-status - Indicates whether an expansion is possible is in progress, or has failed. A value of "-" indicates expansion is possible, but is not in progress, and has not failed.

Examples

In the following example, all devices on cluster-1 are healthy:

```
VPlexcli:/clusters/cluster-1/virtual-volumes> virtual-volume summary
Virtual-volume health summary (cluster-1):
        Total 589 virtual-volumes, 0 unhealthy.
Expansion summary:
        No expansion activity.
Locality summary:
        distributed : 65 virtual-volumes.
```

```
        local : 494 virtual-volumes.
        remote : 30 virtual-volumes.
Cache-mode summary:
        asynchronous : 0 virtual-volumes.
        synchronous : 589 virtual-volumes.
Total virtual-volume capacity is 87.9T.
```

In the following example, one distributed virtual volume has expandable capacity at both clusters:

```
VPlexcli:/> virtual-volume summary
Virtual-volume health summary (cluster-1):
        Total 2152 virtual-volumes, 0 unhealthy.
Expansion summary:
virtual-volume name  expandable-capacity  capacity  expansion-status
-------------------  -------------------  --------  ----------------
dr_one2one_CX_0_vol  10G                  10G       -
        Total 1 expansion: 0 in-progress, 0 failed.
Locality summary:
        distributed : 903 virtual-volumes.
        local : 1074 virtual-volumes.
        remote : 175 virtual-volumes.
Cache-mode summary:
        asynchronous :    0 virtual-volumes.
        synchronous : 2152 virtual-volumes.
Total virtual-volume capacity is 43.7T.
Virtual-volume health summary (cluster-2):
        Total 1991 virtual-volumes, 0 unhealthy.
Expansion summary:
virtual-volume name  expandable-capacity  capacity  expansion-status
-------------------  -------------------  --------  ----------------
dr_one2one_CX_0_vol  10G                  10G       -
        Total 1 expansion: 0 in-progress, 0 failed.
Locality summary:
        distributed : 903 virtual-volumes.
        local : 960 virtual-volumes.
        remote : 128 virtual-volumes.
Cache-mode summary:
        asynchronous :    0 virtual-volumes.
        synchronous : 1991 virtual-volumes.
Total virtual-volume capacity is 43.9T.
```

See also

- `ds summary`
- `export port summary`
- `export storage-view summary`
- `extent summary`
- `local-device summary`

wait

Causes a wait until specified context-tree conditions are met.

Contexts

All contexts.

Syntax

```
wait [-c | --context-list] [, context-list ...]
  [-a | --attribute= attribute]
```

```
[-v | --value= value]
[-t | --timeout= timeout]
    [-h | --help]
        [--verbose]
```

Arguments

Required arguments	
`[-c	--context-list] [, context-list ...]`	Context list, separated by commas
Optional arguments	
`[-a	--attribute]`	Attribute name
`[-v	--value]`	Attribute value
`[-t	--timeout]`	Timeout in seconds. Default is twenty seconds (`20s`)
`[-h	--help]`	Displays the usage for this command
`[--verbose]`	Provides additional output during command execution. This may not have any effect for some commands.

Description

If a `context-list` is provided without an attribute, the command will wait until the contexts in the list exist. If wildcard patterns are used, the command will wait until at least one context can be resolved for every pattern.

If an attribute and value pair are given, the command will wait until the attribute of every context resolved from `context-list` has the given value.

The attribute values are compared as strings.

Use the `--timeout` option to set the timeout in seconds. The default timeout is `20` seconds.

webserver

Start, stop, or restart the Webserver.

Contexts

All contexts.

Syntax

```
webserver [stop | start | restart]
        [-h | --help]
        [--verbose]
```

Arguments

Optional arguments	
`[-h	--help]`	Displays the usage for this command
`[--verbose]`	Provides additional output during command execution. This may not have any effect for some commands.

Description

This command starts, stops, or restarts the Webserver.

ⓘ **NOTE:** To ensure a successful restart of the Webserver, it is recommended to avoid using the `restart` option as it has proven to be unreliable in some cases due to a number of external environmental factors. Instead, to restart, issue a `stop`, and then a `start`. After issuing these commands, verify that the Webserver is running.

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