Dell PowerVault ME4 Series Storage System

CLI Guide

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Notes, cautions, and warnings

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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Using the CLI

This chapter introduces the command-line interface (CLI).

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Accessing the CLI

The CLI software that is embedded in the controller modules enables you to manage and monitor storage-system operation. You can access the CLI in two ways:

- Use SSH or Telnet on a management host that is remotely connected to a controller module network port through a LAN.
- Use a serial cable to establish a serial connection from a computer to the CLI port on a controller module .

For information about accessing the CLI and obtaining IP values for storage system management, see the *Dell PowerVault ME4 Series Storage System Deployment Guide*.

CLI output formats

The CLI has two output formats:

- Console format, which is the human-to-computer interface (HCI).
- API format, which is the computer-to-computer interface (CCI).

Console format enables users to interact with the CLI and obtain easily readable information. This format automatically sizes fields according to content and adjusts content to window resizes. These capabilities would present problems for a CCI in the form of scripts or other client software. In console format, some commands display confirmation prompts.

API format enables any external application to interact with the storage system. XML and JSON formats are supported. Both formats are constructed to allow new fields to be added without impacting existing clients if they follow standard parsing conventions for the respective format. In API format, commands do not use confirmation prompts.

Scripting is not supported using console format because labels, field sizes, and order of fields might change in future firmware releases. To properly script CLI commands, use API format, which is expected to remain consistent from release to release; field names will be consistent and new functionality will be added as new fields. These types of changes in API output will not impact a conventional XML or JSON parsing engine.

You can change the CLI output format by using the set cli-parameters command.

Using CLI interactively

The CLI is an interactive application. When you are logged into the CLI, the CLI waits for a command and then responds to the command.

NOTE: In the interactive mode, confirmation is required for commands that can cause data unavailability or data loss.

The following example shows interactively starting an SSH session, logging into the CLI, running a command, and exiting the CLI:

```
$: ssh manage@IP-address
Password:

Product name
System Name: Name
```

```
System Location: Location
Version: firmware version
# show controller-date
Controller Date: 2019-09-30 11:05:12
Time Zone Offset: -07:00

Success: Command completed successfully. (2019-09-30 11:05:12)

# exit
```

Using a script to access the CLI

Basic command-line semantics provide prompts for user input, and response time is indeterminate. Scripts need to use an "expect"-type mechanism to scan output for prompts. It is recommended and more efficient to use the HTTP interface to access the API.

Two login methods are supported:

- HTTPS authentication using an SHA256 hash to return a session key that is sent for each request. The session key is valid has a 30-minute inactivity timeout. Use of SHA256 is now recommended instead of MD5, which is deprecated.

  To log in to the HTTPS API, the username and password must be joined with an underscore as a separator (**username_password**). The username and password is then sent through an SHA256 hash. The SHA256 hash is represented in lower case hexadecimal format. This string is appended to the login function for the API, `https://IP-address/api/login/hash`. For example:

  ```
  https://10.0.0.2/api/login/539e12f63b693a9970a97b885e857f8b
  ```

- HTTPS basic authentication using the `Authorization` header. If this login method is used, the username and password must be joined with a ':' (**username:password**) and then encoded in Base64. For example:

  ```
  Authorization: Basic base64-string
  ```

  Use the following URL for basic authentication:

  `https://IP-address/api/login`

For both methods, the response that is returned is in XML and the content contains an `OBJECT` element. Within the `OBJECT` element, a `PROPERTY` element with the name attribute of response contains the session key. These XML API elements are described in XML API elements.

The following example shows how to construct a Perl script to communicate with the XML API using HTTPS:

NOTE: The API provides default self-signed certificates for an HTTPS connection. To validate the certificate, download it through a browser and then set the following environment variable to point to the certificate:

```
# export HTTPS_CA_FILE=path-to-certificate
```

```
# Include required libraries
 use LWP::UserAgent;
 use Digest::SHA qw(sha256_hex);
 use XML::LibXML;

# Generate the login hash used to authenticate the user. The username
# and password are hard coded here to illustrate the requirements for the string.
# The user name and password must be joined with an underscore.

my $auth_data = "username_password";
my $sha256_hash = sha256_hex( $auth_data );

# Create a user agent for sending https requests and generate a request object.

$user_agent = LWP::UserAgent->new( );
$url = 'https://IP-address/api/login/' . $sha256_hash;
$request = HTTP::Request->new( GET => $url );

# Send the request object to the system. The response will be returned.
$response = $user_agent->request($request);
```

```
# Once the script has logged in, the response returns back a session key.
# This code shows how to retrieve that session key.

my $parser = XML::LibXML->new();
my $document = $parser->parse_string( $response->content );

my $root = $document->getDocumentElement;
my @objects = $root->getElementsByTagName( 'OBJECT' );
my @properties = $objects[0]->getElementsByTagName( 'PROPERTY' );
my $sessionKey;
foreach my $property ( @properties ) {
my $name = $property->getAttribute( 'name' );

if( $name eq 'response' ) {
$sessionKey = $property->textContent;
}
}
```

The following example shows how to construct a Python script to communicate with the JSON API using HTTPS:

```
import sys
import requests
import json
import hashlib

# NOTE: This is to suppress the insecure connection warning for certificate
# verification.
from requests.packages.urllib3.exceptions import InsecureRequestWarning
requests.packages.urllib3.disable_warnings(InsecureRequestWarning)

url = "https://IP-address"
auth_string = hashlib.sha256('username_password').hexdigest()

# Login and obtain the session key.
headers = {'datatype':'json'}
r = requests.get(url + '/api/login/' + auth_string, headers=headers, verify=False )
response = json.loads(r.content)
sessionKey = response['status'][0]['response']

# Obtain the health of the system
headers = {'sessionKey': sessionKey, 'datatype':'json'}
r = requests.get(url+'/api/show/system', headers=headers, verify=False)
print r.content
response = json.loads(r.content)
print "Health = " + response['system'][0]['health']
```

The following code segment shows how to get the entire configuration information from the CLI and print the output using the `ipa` option for XML output:

NOTE: The output can be redirected to a file for archiving.

```
$url = 'https://IP-address/api/show/configuration';
$request = HTTP::Request->new(GET => $url );
$request->header('sessionKey' => $sessionKey );
$request->header('dataType' => 'ipa' );

$response = $user_agent->request( $request );
print $response->content;
```

Alternatively, the `dataType` in the request header can be set to `json` for JSON output, or to `console` for standard CLI text output. Do not use the console output should for parsing. However, the console output can be useful for tabular reports that are obtained directly from the CLI commands.

Using XML API output

The Management Controller provides access for monitoring and management using the SSH and Telnet protocols for command-line interface semantics, or using the HTTP and HTTPS protocols for XML API request/response semantics.

You can use an XML parser, such as XML::Parser in Perl, to process the XML output and store this information as objects.

The output of each CLI command is composed of valid XML data until the CLI prompt (typically #) is encountered. The output contains a valid XML header followed by the XML elements described in the following table.

Table 1. XML API elements

Element	Description and attributes
RESPONSE	The `RESPONSE` element is the top-level element, which contains all data output for the CLI command that was issued. The response includes: ● A number of `OBJECT` elements, which varies by command. ● A status object that provides a message and return code. A return code of 0 indicates that the command succeeded. Any other return code is an error code. There is only one `RESPONSE` element per issued command.
OBJECT	In general, an OBJECT element describes a storage-system component such as a disk or a volume. An object has these attributes: ● `basetype`: This attribute allows output in brief mode to be correlated with metadata to reduce the overhead of each command, as described in XML API optimization. This is also a good field to use to detect the type of the object (e.g., a disk, a volume, etc.). ● `name`: The name of the object. ● `oid`: The unique identifier for the object in the scope of the response. The `OBJECT` element can contain `PROPERTY` elements.
PROPERTY	A `PROPERTY` element provides detail about the attributes of an OBJECT. A property has these attributes: ● `name`: The unique name for the property within the object. ● `key`: Indicates whether this property is a key value to identify this object. ● `type`: The type of data represented by the element data. ● `size`: Typically the maximum size of the output. Usually only important if the console output is displayed in rows. ● `draw`: Whether to show or hide this data in console format. ● `sort`: The type of sorting that can be applied to this property. ● `display-name`: The label for this data to show in user interfaces.
COMP	A `COMP` (composition) element associates nested objects, such as a task object within a schedule object. A composition element has these attributes: ● `P`: The oid of the part component. ● `G`: The oid of the group component. An alternative to using COMP elements is described in XML API optimization.
ASC	The association element provides a simple association description between two objects in the response. ● `A`: First object. ● `B`: Second object.

Using JSON API output

The simplest mechanism to handle JSON output is by using either a JavaScript or a Python parser to interpret the data.

The JSON output is organized according to the basetypes defined for the system. All basetype objects are returned in an array. The JSON object uses the same name for the key as the XML API uses in the name attribute. Objects can also be embedded inside of other objects are always presented as an array as well. This is different from the XML API where the default output uses associations. The JSON output always uses a hierarchical presentation of objects to identify relationships between objects.

Each object also has an object-name property that may be used in some cases to identify the object uniquely. For example, the show versions command uses the `object-name` property to identify the version for controller A and controller B:

```
{
"versions":[
{
"object-name":"controller-a-versions",
 "sc-cpu-type":"SC-CPU-type",
"bundle-version":"bundle-version",
```

```
"bundle-base-version":"bundle-base-version",
 "build-date":"Mon Jul 17 14:15:44 MDT 2017",
...
},
{
"object-name":"controller-b-versions",
...
}
],
"status":[
{
"object-name":"status",
 "response-type":"Success",
 "response-type-numeric":0,
"response":"Command completed successfully. (2017-07-27 10:21:36)",
 "return-code":0,
"component-id":"",
"time-stamp":"2017-07-27 10:21:36",
"time-stamp-numeric":1501150896
}
]
}
```

Other basetypes may use the durable ID to uniquely identify the objects.

Scripting guidelines

When scripting command input, use CLI syntax as defined in this guide. For use with SSH or Telnet, use a space character between command names, parameters, and their values (as shown throughout this guide). For use with the HTTP or HTTPS interface, use a '/' character instead of a space character between command names, parameters, and their values.

When writing scripts to parse XML API output, use an XML library to parse the data. For parsing, a script should not rely on ordering, spacing, or column position. To find a specific property, a script should compare property names as it searches through the data. This allows the script to be compatible with future versions that could potentially add new fields to the output.

CAUTION: Because API format does not use confirmation prompts, use caution when scripting commands that may cause data unavailability or data loss.

The output of show commands is intended for monitoring or obtaining the current configuration. Other commands provide configuration data and display one or more status objects that specify the status of command processing. The last status object specifies the overall status of the command; other status objects indicate intermediate processing status.

The following example shows the API status object, using the `ipa` output option:

```
OBJECT basetype="status" name="status" oid="1"
<PROPERTY name="response-type" type="string">Success</PROPERTY>
<PROPERTY name="response-type-numeric" type="uint32">0</PROPERTY>
<PROPERTY name="response" type="string">Command completed successfully. (2017-07-20
11:38:26)</PROPERTY>
<PROPERTY name="return-code" type="sint32">0</PROPERTY>
<PROPERTY name="component-id" type="string"></PROPERTY>
<PROPERTY name="time-stamp" type="string">2017-07-20 11:38:26</PROPERTY>
<PROPERTY name="time-stamp-numeric" type="uint32">1500550706</PROPERTY>
</OBJECT>
```

The following example shows the API status object, using the `json` output option:

```
"status":[
{
"object-name":"status",
 "response-type":"Success",
 "response-type-numeric":0,
"response":"Command completed successfully. (2017-07-20 11:38:48)", "return-code":0,
"component-id":"",
"time-stamp":"2017-07-20 11:38:48",
"time-stamp-numeric":1500550728
}
]
```

In a script, each command should check the previous command's status before proceeding. If the value of the status object's `return-code` property is 0, the command succeeded; any other value means that the command failed.

NOTE: If you script an operation to repeatedly add and remove disk groups, set a delay of at least two minutes between deleting a disk group and creating the next one.

Example command input and API output

The following example shows a command formatted for use with the command-line interface, the same command formatted for use with the HTTPS interface, and command output in the XML and JSON APIs.

- Command-line interface format: `create user JSmith interfaces wbi password Abc#1379`
- HTTPS interface format: `create/user/JSmith/interfaces/wbi/password/Abc#1379`
- XML API output:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<RESPONSE VERSION="L100">
<OBJECT basetype="status" name="status" oid="1">
<PROPERTY name="response-type" type="string" size="12" draw="false" sort="nosort"
display-name="Response Type">Success</PROPERTY>
<PROPERTY name="response-type-numeric" type="uint32" size="12" draw="false"
sort="nosort"
display-name="Response Type">0</PROPERTY>
<PROPERTY name="response" type="string" size="180" draw="true" sort="nosort"
display-name="Response">Command completed successfully. (JSmith) - The new user was
created.
(2014-07-10 14:16:29)</PROPERTY>
<PROPERTY name="return-code" type="sint32" size="15" draw="false" sort="nosort"
display-name="Return Code">0</PROPERTY>
<PROPERTY name="component-id" type="string" size="80" draw="false" sort="nosort"
display-name="Component ID">JSmith</PROPERTY>
<PROPERTY name="time-stamp" type="string" size="25" draw="false" sort="datetime"
display-name="Time">2014-07-10 14:16:29</PROPERTY>
<PROPERTY name="time-stamp-numeric" type="uint32" size="25" draw="false"
sort="datetime"
display-name="Time">1405001789</PROPERTY>
</OBJECT>
</RESPONSE>
```

- JSON API output:

```
{
"status":[
{
"object-name":"status",
"response-type":"Success",
"response-type-numeric":0,
"response":"Command completed successfully. (JSmith) - The new user was created.
(2017-07-27 10:27:46)",
"return-code":0,
 "component-id":"JSmith",
"time-stamp":"2017-07-27 10:27:46",
"time-stamp-numeric":1501151266
}
]
}
```

XML API optimization

For the XML API only, the following are two ways to optimize performance:

- Use embedded objects. This allows one object to contain not only properties but also other objects. In general, parsing a structure such as this is easier as the association between objects is simpler. This is an alternative to using `COMP` elements.
- Use brief mode. In brief mode, which is disabled by default, returns a subset of attributes of object properties. The name and type attributes are always returned. Other properties can be obtained by using the meta command with the basetype of the object. This optimization reduces the number of bytes transmitted for each request and allows caching of CLI metadata. Brief mode can be enabled or disabled by using the set cli-parameters command.

The following example shows brief mode output, in which a subset of attributes is returned, and use of embedded objects:

```
# show ports
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<RESPONSE VERSION="L100" REQUEST="show ports">
<OBJECT basetype="port" name="ports" oid="1" format="rows">
<PROPERTY name="durable-id" type="string">hostport_A0</PROPERTY>
<PROPERTY name="controller" key="true" type="string">A</PROPERTY>
<PROPERTY name="controller-numeric" key="true" type="string">1</PROPERTY>
<PROPERTY name="port" key="true" type="string">A0</PROPERTY>
<PROPERTY name="port-type" type="string">FC</PROPERTY>
...
<OBJECT basetype="fc-port" name="port-details" oid="2" format="rows">
<PROPERTY name="configured-topology" type="string">PTP</PROPERTY>
<PROPERTY name="primary-loop-id" type="string">N/A</PROPERTY>
<PROPERTY name="sfp-status" type="string">Not present</PROPERTY>
...
</OBJECT>
</OBJECT>
...
<OBJECT basetype="status" name="status" oid="17">
<PROPERTY name="response-type" type="string">Success</PROPERTY>
...
</OBJECT>
</RESPONSE>
```

For the JSON API, embedding objects is the only way to show relationships and brief mode is not applicable.

Command syntax

General rules for specifying commands

Command names and parameter names are not case sensitive.

Parameters enclosed in square brackets ([ ]) are optional. Do not type the bracket characters.

Parameter values separated by '|' characters are options. Enter only one of the values. Unless specified otherwise, enumerated values are not case sensitive.

Parameter values in italics are variables. Substitute text that is appropriate for the task you want to perform. Unless specified otherwise, variable values such as names of users and volumes are case sensitive and have a maximum length in bytes. When encoded in UTF-8, a single character can occupy multiple bytes. Typically:

- 1 byte per character for English, French, German, and Spanish
- 3 bytes per character for Chinese, Japanese, and Korean

Unless otherwise specified, a parameter value can include spaces and printable UTF-8 characters except: " , < > \

A parameter value that includes a space must be enclosed in double quotes. Unless specified otherwise, if you include leading or trailing spaces with a value (such as a name) in double quotes, those spaces are treated as part of the value.

Parameters can be entered in any order. However, for a parameter with no keyword, if you want to specify a value that is partially or entirely the same as the keyword of an optional parameter, you must specify the optional parameter before the value. For example, to create a user named *base* you must specify the optional `base` parameter before the name base: `create user base 2` base

Specifying drawers

In an enclosure with drawers:

- Disk drawers are specified by enclosure ID and drawer number. Enclosure IDs increment from 0. Drawer IDs increment from 0 in each enclosure. Example: `2.1`
- Disks are specified without the drawer number, as described below.

Specifying disks

Disks are specified by enclosure ID and slot number. Enclosure IDs increment from 0. Disk IDs increment from 0 in each enclosure. You can specify:

- A disk. Example: `1.4`
- A hyphenated range of disks. Example: `1.4-7`
- A comma-separated list of individual disks, ranges, or both (with no spaces). Example: `1.4,1.6-9`
- A RAID 10 or 50 disk group with disks in subgroups separated by colons (with no spaces). RAID-10 example:`1.1-2:1.3-4:1.7,1.10`

Specifying disk groups

You can specify:

- A disk group by its name or serial number. A unique serial number is automatically assigned when a disk group is created, and does not change for the life of the disk group.
- A list of disk-group names or serial numbers separated by commas (with no spaces). Not all commands support lists. Example: `dg1,"Disk group 1"`

Specifying pools

For virtual storage, you can specify:

- A pool by its name or serial number.
- A list of pool names or serial numbers separated by commas (with no spaces). Not all commands support lists. Example: `A,B`

Specifying volumes

You can specify:

- A volume by its name or serial number. A unique serial number is automatically assigned when a volume is created, and does not change for the life of the volume.
- A list of volume names or serial numbers separated by commas (with no spaces). Not all commands support lists. List example: `vd1_v1,"Vol #1"`.

Specifying volume groups

For virtual storage, you can specify:

- A volume group by its name in the format *`volume-group`*`.*`, where * represents all volumes in the group. Example: `TestVolumes.*`

Specifying ports

Controller module host ports are specified by port number only (to use the same port in both controllers) or by controller ID and port number (to specify a port in one controller).

In a 2U12 or 2U24 enclosure, the top controller module ID is A and the bottom controller module ID is B. In a 5U84 enclosure, the left controller module ID is A and the right controller module ID is B. Controller module IDs are not case sensitive.

Port IDs increment from 0 in each controller module.

You can specify:

- A port ID in both controllers. Example: `1`
- A port ID in one controller. Example: `A1`
- A hyphenated range of IDs. Do not mix controller IDs in a range. Example: `b1-b2 or 1-2`
- A comma-separated list of IDs, ranges, or both (with no spaces). Example: `A1,b1-b2 or A1,2`

Specifying initiators and hosts

You can specify:

- An FC initiator by its nickname or 16-hex-digit WWPN.
- A SAS initiator by its nickname or 16-hex-digit WWPN.
- An iSCSI initiator by its nickname or node name (typically the IQN).
- A host by name in the format *host-name.**, where * represents all initiators in the host. Example: `Mail_Server.*`

Specifying host groups

For virtual storage, you can specify:

- A host group by name in the format *`host-group`*`.*.*`, where the first * represents all hosts in the group and the second * represents all initiators in those hosts. Example: `TestLab.*.*`

Specifying fan modules

In a 5U84 enclosure:

- Fan modules are specified by enclosure ID and module number.
- Enclosure IDs increment from 0.
- Module IDs increment from 0 in each enclosure.

Example: `1.1`

User password rules

- The value is case sensitive.
- The value can have 8–32 characters.
- The value can include printable UTF-8 characters except a space or: " ' , < > \
- A value that includes only printable ASCII characters must include at least one uppercase character, one lowercase character, one numeric character, and one non-alphanumeric character. This rule does not apply if the password contains UTF-8 characters that are outside the range of printable ASCII characters.

Command completion, editing, and history

The CLI supports command completion, command editing, and command history.

When entering commands interactively you can abbreviate their names and keywords. For example, you can enter `sho cl` to run the `show cli-parameters` command. If you press Tab or Ctrl+i after typing sufficient characters to uniquely identify the command or keyword, the remainder of the command or keyword is displayed so you can confirm your intent. If you enter too few letters to uniquely identify a keyword, pressing Tab or Ctrl+i will list commands or keywords that match the entered string and redisplays the string so you can complete it.

When scripting commands, type commands in full to aid readability.

The history contains commands entered in the active CLI session. You can recall a command from the history, edit it, and run it.

Table 2. Keyboard shortcuts for command completion, editing, and history

Action	Press
Complete a partially entered keyword	Tab or Ctrl+i
Show command history	F6
Get previous command from history	Up Arrow
Get next command from history	Down Arrow
Move cursor left	Left Arrow

Table 2. Keyboard shortcuts for command completion, editing, and history (continued)

Action	Press
Move cursor right	Right Arrow
Delete previous character	Backspace

Size representations

Operating systems usually show volume size in base 2. Disk drives usually show size in base 10. Memory (RAM and ROM) size is always shown in base 2.

In the CLI, the base for entry and display of storage-space sizes can be set per user or per session; see create user and set cli-parameters. When entering storage-space sizes only, either base-2 or base-10 units can be specified.

Table 3. Size representations in base 2 and base 10

Base 2		Base 10	
Unit	**Size in bytes**	**Unit**	**Size in bytes**
KiB (kibibyte)	1,024	KB (kilobyte)	1,000
MiB (mebibyte)	1,024	MB (megabyte)	1,000
GiB (gibibyte)	1,024	GB (gigabyte)	1,000
TiB (tebibyte)	1,024	TB (terabyte)	1,000
PiB (pebibyte)	1,024	PB (petabyte)	1,000
EiB (exbibyte)	1,024	EB (exabyte)	1,000

The locale setting determines the character used for the decimal (radix) point, as shown in the following table:

Table 4. Decimal (radix) point character by locale

Language	Character	Examples
English, Chinese, Japanese, Korean	Period (.)	146.81 GB 3.0 Gb/s
French, German, Spanish	Comma (,)	146,81 GB 3,0 Gb/s

Event log

A controller enclosure's event log records all events that have occurred in or been detected by the controller modules and encompasses all field-replaceable units (FRUs) in the storage system.

Each event has one of the following levels, in decreasing severity:

- Critical. A failure occurred that may cause a controller to shut down. Correct the problem *immediately*.
- Error. A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible.
- Warning. A problem occurred that may affect system stability but not data integrity. Evaluate the problem and correct it if necessary.
- Informational. A configuration or state change occurred, or a problem occurred that the system corrected. No action is required.
- Resolved. A condition that caused an event to be logged has been resolved.

For information about viewing events, see the show events command.

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Categorical list of commands

The following table helps you find a command within a category of functionally related commands:

NOTE: A command might appear in more than one category.

Table 5. Commands by category

Category	Commands	
CLI and users	create user	set prompt
	delete user	set user
	exit	show cli-parameters
	help	show sessions
	set cli-parameters	show users
	set password	
Disks, disk groups, pools, tiers, and spares	abort scrub	set disk
	abort verify	set disk-group
	add disk-group	set expander-fault-isolation
	add spares	set fde-import-key
	storage	set fde-lock-key
	clear disk-metadata	set fde-state
	clear fde-keys	set led
	clear fenced-data	set pool
	create vdisk	set vdisk
	delete pools	show disk-groups
	delete vdisks	show disks
	dequarantine	show fde-state
	expand vdisk	show pools
	remove spares	show tiers
	rescan	show vdisks
	scrub disk-groups	verify disk-groups
	scrub vdisk	verify vdisk
Volumes, volume groups, initiators, hosts, host groups, and mapping	add host-group-members	remove volume-group-members
	add host-members	scrub volume
	add volume-group-members	set host
	create host	set host-group
	create host-group	set host-port-mode
	create volume	set initiator
	create volume-group	set volume
	create volume-set	set volume-group
	delete host-groups	show cache-parameters

Table 5. Commands by category (continued)

Category	Commands	
	delete hosts	show host-groups
	delete initiator-nickname	show initiators
	delete volume-groups	show maps
	delete volumes	show ports
	expand disk-group	show unwritable-cache
	expand volume	show volume-groups
	map volume	show volume-names
	release volume	show volume-reservations
	remove disk-groups	show volumes
	remove host-group-members	unmap volume
	remove host-members	
Snapshots	create snapshots	rollback volume
	delete all-snapshots	set snapshot-space
	delete snapshot	show snapshot-space
	reset snapshot	show snapshots
Virtual volume copy	abort copy	
	copy volume	
	show volume-copies	
Scheduled tasks	create schedule	set schedule
	create task	set task
	delete schedule	show schedules
	delete task	show tasks
Event notification	set email-parameters	show events
	set snmp-parameters	show snmp-parameters
	set syslog-parameters	show syslog-parameters
	show email-parameters	test
System configuration and utilities	check firmware-upgrade-health	show chap-records
	clear cache	show configuration
	clear dns-parameters	show controller-date
	create certificate	show controllers
	create chap-record	show disk-parameters
	delete chap-records	show dns-parameters
	ping	show enclosures
	reset dns-management-hostname	show expander-status
	reset host-link	show fan-modules
	restart mc	show fans
	restart sc	show fenced-data
	set advanced-settings	show frus
	set chap-record	show inquiry

Table 5. Commands by category (continued)

Category	Commands	
	set controller-date	show iscsi-parameters
	set disk-parameters	show license
	set dns-parameters	show network-parameters
	set enclosure	show ntp-status
	set expander-fault-isolation	show ports
	set host-parameters	show power supplies
	set host-port-mode	show protocols
	set iscsi-parameters	show provisioning
	set led	show redundancy-mode
	set network-parameters	show sas-link-health
	set ntp-parameters	show sensor-status
	set protocols	show shutdown-status
	set system	show system
	set volume-cache-parameters	show system-parameters
	show advanced-settings	show versions
	show cache-parameters	shutdown
	show certificate	verify links
Service utilities	clear events	restore defaults
	clear expander-status	set expander-fault-isolation
	reset smis-configuration	show service-tag-info
API specific	meta	
	show refresh-counters	
Remote systems	delete remote-system	
	show remote-systems	
Peer connections	create peer-connection	
	delete peer-connection	
	query peer-connection	
	set peer-connection	
	show peer-connection	
Virtual volume replication	abort replication	resume replication-set
	clear replication-queue	set replication-set
	create replication-set	show replication-sets
	delete replication-set	show replication-snapshot-history
	replicate	suspend replication-set
Statistics	reset all-statistics	show controller-statistics
	reset controller-statistics	show disk-group-statistics
	reset disk-error-statistics	show disk-statistics
	reset disk-group-statistics	show host-phy-statistics

Table 5. Commands by category (continued)

Category	Commands	
	reset disk-statistics	show host-port-statistics
	reset host-port-statistics	show pool-statistics
	reset pool-statistics	show tier-statistics
	reset vdisk-statistics	show vdisk-statistics
	reset volume-statistics	show volume-statistics
IPv6	add ipv6-address	show ipv6-addresses
	remove ipv6-address	show ipv6-network-parameters
	set ipv6-network-parameters	
SupportAssist and CloudIQ	check support-assist	set support-assist-info
	clear support-assist-proxy	set support-assist-proxy
	send support-assist-logs	show cloudiq
	set cloudiq	show support-assist
	set support-assist	

3

Alphabetical list of commands

This chapter is organized to help you find a command by name. Each command topic includes one or more of the following sections:

Description	The command's purpose and notes about its usage
Minimum role	The minimum user role required to use the command
Syntax	The command's syntax
Parameters	Descriptions of the command's parameters
Output	Descriptions of fields shown in console format
Examples	One or more examples of the command's usage in console format
Basetypes	References to descriptions of basetype properties shown in API format
See also	References to commands that are used with the command

abort copy

Description	Aborts a copy volume operation. When the operation is complete, the destination volume is deleted.
Minimum role	manage
Syntax	`abort copy` *`volume-ID`*
Parameters	*`volume-ID`* The name or serial number of the source volume or the destination volume. A name that includes a space must be enclosed in double quotes.
Examples	Abort copying volume *SourceVol* to volume *DestVol*. `# abort copy SourceVol`
See also	copy volume show volume-copies show volumes

abort replication

Description	Aborts the current replication operation for the specified replication set. This command applies to virtual storage only. This command must be run on the replication set of the primary system. For the command to succeed, the replication set state must be either *Running* or *Suspended*. Attempting to abort replication for a replication set whose state is either *Ready* or *Unsynchronized* fails with an error message.

	If you abort a running replication, the replication set returns to the state it had before replication started – either *Ready* or *Unsynchronized*. If you abort a suspended replication, the state of the replication set remains Suspended. **NOTE:** If you abort a replication operation, the snapshot space that is allocated for that replication in the primary pool and the secondary pool will not be freed. To free that space, either re-run the initial replication or delete the replication set.
Minimum role	manage
Syntax	`abort replication`
Parameters	*replication-ID* The name or serial number of the replication set in which to abort replications.
Examples	Abort active replications in replication set *RS1* `# abort replication RS1`
See also	replicate resume replication-set show replication-sets suspend replication-set

abort scrub

Description	Aborts a media scrub operation.
Minimum role	manage

Syntax	`abort scrub`
	`[disk-group` *`disk-groups`*`]`
	`vdisk` *vdisks*
	`[volume` *`volumes`*`]`

Parameters	Specify only one of the following parameters. `disk-group` *disk-groups* Optional. A comma-separated list of the names or serial numbers of the disk groups to stop scrubbing. A name that includes a space must be enclosed in double quotes. `vdisk` *vdisks* Optional. A comma-separated list of the names or serial numbers of the linear disk groups to stop scrubbing. A name that includes a space must be enclosed in double quotes. `volume` *volumes* Optional. A comma-separated list of the names or serial numbers of the volumes to stop scrubbing. A name that includes a space must be enclosed in double quotes.

Examples	Abort scrubbing disk group `dg1`
	`# abort scrub disk-group dg1`
	Abort scrubbing linear disk group `vd1`.
	`# abort scrub vdisk vd1`
	# abort scrub volume `vol1`
	`scrub disk-groups scrub vdisk`

See also	scrub disk-groups

	scrub vdisk scrub volume show disk-groups show vdisks show volumes

abort verify

Description	Aborts a media verify operation.
Minimum role	manage

Syntax	`abort verify`
	`[disk-group` *`disk-groups`*`]`
	`[vdisk vdisks]`

Parameters	`disk-group` *`disk-groups`* Optional. A comma-separated list of the names or serial numbersof the disk groups to stop verifying. A name that includes a space must be enclosed in double quotes. `vdisk` *`vdisks`* Optional. A comma-separated list of the names or serial numbers of the linear disk groups to stop verifying. A name that includes a space must be enclosed in double quotes.

Examples	Abort verifying disk group `dg1`.
	`# abort verify disk-groupdg1`
	Abort verifying linear disk group `vd1`.
	`# abort verify vdisk vd1`

See also	show disk-groups show vdisks verify disk-groups verify vdisk

add disk-group

Description	Creates a disk group using specified disks. • If the system has no disk groups, you can create either a linear or a virtual disk group. Whichever storage type you choose, the system will use that type for new disk groups. To switch to the other storage type, you must first remove all disk groups by using the remove disk-groups command. • All disks in a disk group must be the same type (enterprise SAS, for example). All disks in a disk group must be the same type (enterprise SAS, for example). **NOTE:** A disk group can contain a mix of 512-byte native sector size (512n) disks and 512-byte emulated sector size (512e) disks. For consistent and predictable performance, do not mix disks of different sector size types (512n, 512e). For virtual storage, a disk group of midline SAS disks will be used in the Archive tier. A disk group of enterprise SAS disks will be used in the Standard tier. A disk group of SSDs can be used: • In the Performance tier • As an all-flash array • As read cache. A virtual pool can contain only one read-cache disk group

	A virtual pool cannot contain both a read-cache disk group and a Performance tier. At least one virtual disk group must exist in a pool before a read-cache disk group can be added. A read-cache disk group can contain a maximum of two disks. When you add a virtual disk group, the system will first prepare the disk group to be added to a virtual pool. During preparation, the disk group's status will be VPREP and the disk group cannot be removed. When preparation is complete, the disk group will start initializing. During initialization, the disk group's status will be INIT and the disk group will be available to store user data-or the disk group can be removed. ● All virtual disk groups in the same tier in a virtual pool should have the same RAID level, capacity, and physical number of disks. This will provide consistent performance across the tier. ● To replace a single-disk read-cache disk group with a multiple-disk read-cache disk group, simply remove the read cache and re-add it. **NOTE:** If the only disk group in a virtual pool is quarantined, the pool will be inaccessible and attempting to add a new disk group to that pool will fail with a "duplicate name" error. Before you can add a disk group to that pool, you must resolve the problem with the quarantined disk group.
Minimum role	manage

Syntax	`add disk-group`
	
	`[adapt-spare-capacity` *size*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default]`
	
	`[assigned-to a|b|auto]`
	
	`[chunk-size 64k|128k|256k|512k]`
	
	`disks` *disks*
	
	`[level nraid|raid0|r0|raid1|r1|raid3|r3|raid5|r5|raid6|r6|raid10|r10|raid50|r50|adapt]`
	
	`[mode online|offline]`
	
	`[pool a|b]`
	
	`[spare` *disks*`]`
	
	`type linear|virtual|read-cache`
	
	[name]

Parameters	`adapt-spare-capacity size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default`
	
	Optional. For an ADAPT disk group, this specifies the target spare capacity.
	● `size [B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]` : Sets the target spare capacity to a specific size. The unit is optional (B represents bytes). If no unit is specified, GiB will be used, regardless of the currentbase. Whichever unit is set, internally the value will be rounded down to the nearest GiB. If the value is set to 0, the absolute minimum spare space will be used. If this parameter is omitted, the default setting will be used.
	● `default`: Sets the target spare capacity to the sum of the two largest disks in the disk group, which is sufficient to fully recover fault tolerance after loss of any two disks in the group.
	
	`assigned-to a|b|auto`
	
	Optional for linear storage. Prohibited for virtual storage. For a system operating in Active-Active ULP mode, this specifies the controller module to own the group. To let the system automatically load-balance groups between controller modules, use auto or omit this parameter. In Single Controller mode, this parameter is ignored; the system automatically load-balances groups in anticipation of the insertion of a second controller in the future.
	
	`chunk-size 64k|128k|256k|512k`
	
	Optional for linear storage. Prohibited for virtual storage. Prohibited for ADAPT.
	
	For linear storage, this specifies the amount of contiguous data, in KB, that is written to a disk-group member before moving to the next member of the group. For NRAID and RAID 1, chunk-size has no meaning and is therefore not applicable. For RAID 50, this option sets the chunk size of each RAID-5 subgroup. The chunk size of the RAID-50 group is calculated as: *configured-chunk-size* x (*subgroup-members* - 1). The default is 512k.

For virtual storage, the system will use one of the following chunk sizes, which cannot be changed:

- RAID 1: Not applicable.
- RAID 5 and RAID 6:
  - With 2,4, or 8 non-parity disks: 512k. For example, a RAID-5 group with 3, 5, or 9 total disks or a RAID-6 group with 4, 6, or 10 total disks.
  - Other configurations: 64k
- RAID 10: 512k

For an ADAPT disk group, the system will automatically determine the proper chunk size.

disks *disks*

Specifies the IDs of the disks to include in the group. For disk syntax, see Command syntax. The minimum and maximum numbers of disks supported for each RAID level are:

NRAID: 1 (linear storage only; not fault tolerant)

RAID 0: 2-16 (linear storage only; not fault tolerant)

RAID 1: 2

RAID 3: 3-16 (linear storage only)

RAID 5: 3-16

RAID 6: 4-16

RAID 10: 4-16

RAID 50: 6-32 (liner storage only)

ADAPT: 12-128

RAID 10 requires a minimum of two RAID-1 subgroups each having two disks. RAID 50 requires a minimum of two RAID-5 subgroups each having three disks. NRAID is automatically used for a read-cache disk group with a single disk. RAID 0 is automatically used for a read-cache disk group with multiple disks.

`level nraid|raid0|r0|raid1|r1|raid3|r3|raid5|r5|raid6|r6|raid10|r10|raid50|r50|adapt`

Required for a linear or virtual group. Prohibited for a read-cache disk group. Specifies the RAID level to apply to the member disks.

`mode online|offline`

Optional for a linear group. Prohibited for a virtual or read-cache disk group. Specifies whether the group is initialized online or offline.

- `online` : After a brief initialization period (seconds), the disk-group stateis set to `FTOL` and I/O operations can be performed on the disk group. Subsequently, an initialization pass across the LBA extent is performed during which the existing data on the member data disks of the disk group is read, parity is generated, and only parity is written to the disk group (the data-area contents are preserved and not zeroed). This pass can take hours to complete on a large disk group.Online mode is the defaultfor a linear disk group.Online mode is always used for a virtual disk group.
- `offline` : The disk group will be in an unavailable, offline (OFFL) state during the initialization process, during which zeros are written to all data and parity sectors of the LBA extent of the disk group. This can take hours to complete on a large disk group but is faster than online mode. When initialization is complete, the disk group state is set to `FTOL` and I/O operations can be performed on the disk group.

`pool a|b`

Required for a virtual or read-cache disk group. Prohibited for a linear disk group. Specifies the name of the virtual pool to contain the disk group. If the pool does not already exist, it will be created.

`spare disks`

Optional for a linear disk group. Prohibited for a virtual or read-cache disk group. Prohibited for ADAPT. Specifies the IDs of 1-4 dedicated spares to assign to a RAID 1, 3, 5, 6, 10, or 50 disk group. For disk syntax, see Command syntax. Only global spares are used for virtual disk groups.

`type linear|virtual|read-cache`

Required. Specifies the type of disk group to create.

	• `linear` : A disk group for linear storage. • `virtual` : A disk group for virtual storage. • `read-cache` : A disk group for use as read cache for a virtual pool. `name` Optional for a virtual or read-cache disk group. Required for a linear disk group. Specifies a name for the new disk group. The name must be unique system-wide. Input rules: • The value is case sensitive. • The value can have a maximum of 32 bytes. • The value can include spaces and printable UTF-8 characters except: " , < \ • A value that includes a space must be enclosed in double quotes. If this parameter is omitted, the system will generate the name *dgcontroller-ID#* where # starts at `01` for a virtual disk group, or *rccontroller-ID* for a read-cache disk group.

Examples	Add linear RAID-1 disk group `dg1` with one spare.
	`# add disk-group type linear disks 1.20-21 level r1 spare 1.22 dg1`
	Add ADAPT linear disk group `ALDG`.
	`# add disk-group type linear disks 1.1-12 level adapt ALDG`
	Add a virtual RAID-6 disk group to pool A. The resulting group will have an auto-generated name.
	`# add disk-group type virtual disks 1.16-19 level r6 pool a`
	Add an ADAPT virtual disk group to pool B.
	`# add disk-group type virtual disks 2.1-12 level adapt pool b`
	Add a read-cache disk group to pool B. The resulting group will be named rcB.
	`# add disk-group type read-cache disks 1.18-19 pool b`

See also	expand disk-group remove disk-groups set disk-group show disk-groups show disks

add host-group-members

Description	Adds hosts to a host group. A host group can contain a maximum of 256 hosts. To add a host to a host group, the host must be mapped with the same access, port, and LUN settings to the same volumes or volume groups as every other host in the host group.
Minimum role	manage
Syntax	`add host-group-members` `hosts` *`hosts`* *`host-group`*
Parameters	`hosts` *`hosts`* A comma-separated list of the names of hosts to add to the specified host group. A name that includes a space must be enclosed in double quotes.
Examples	Add existing hosts `Host3` and `Host4` to existing host group `HostGroup1`. `# add host-group-members hosts Host3,Host4 HostGroup1`
See also	remove host-group-members

	show host-groups show initiators

add host-members

Description	Adds initiators to a host. A host can contain a maximum of 128 initiators. To add an initiator to a host, the initiator must be mapped with the same access, port, and LUN settings to the same volumes or volume groups as every other initiator in the host.
Minimum role	manage
Syntax	`add host-group-members` `initiators` *`initiators`* *`host-name`*
Parameters	`initiators`*`initiators`* A comma-separated list of the nicknames or IDs of initiators to add to the specified host. A name that includes a space must be enclosed in double quotes.
Examples	Add existing initiators `Init3and Init4` to existing host `Host1`. `# add host-members initiators Init3,Init4 Host1`
See also	create host remove host-group-members show host-groups show initiators

add ipv6-address

Description	Adds a static IPv6 address for a controller network port. A maximum of eight static IPv6 addresses can be configured, four per controller. These addresses can be configured at any time, but can only become active when the set ipv6-network-parameters command's `autoconfig` parameter is disabled. All addresses added to the IPv6 address list should be reachable if `autoconfig` is disabled. They are ignored if `autoconfig` is enabled. Static addresses are stored on the controller enclosure midplane. Therefore the addresses will persist even if both controller modules are replaced.
Minimum role	manage

Syntax	`add ipv6-address`
	`[address-label` *`name`*`]`
	`[controller a|b]`
	`ip-address` *`IP-address`*
	`[prefix-length` *`value`*`]`

Parameters	address-label *name* Optional. Lets you specify a name for how the address is used. Input rules: • The value is case sensitive. • The value can have a maximum of 32 bytes.

	• The value can include spaces and printable UTF-8 characters except: " , < \
	• A value that includes a space must be enclosed in double quotes.
	• If this parameter is specified, each interface needs a unique name withinthe scope of each controller. For example, controller A can have only one address labeled `vlan1`, and controller B can also have only one address labeled `vlan1` .
	`controller a|b`
	Optional. Specifies to change controller A or B, only. If this parameter is omitted, changes affect the controller being accessed.
	`ip-address IP-address`
	Specifies the IPv6 address to add.
	The value may include the standard `IPv6 /prefixLength 1-128` notation; or the `prefixLength` may be omitted if the `prefix-length` parameter is used instead.
	The address cannot be used elsewhere in the network port configuration.
	`prefix-length value`
	Optional. Specifies the length of the prefix in the IP address.
	This parameter is valid only if the ipparameter value does not include `/prefixLength` notation.

Examples	Add an IPv6 address named `vlan1` to the network port in controller A only. `# addipv6-address controller a address-label vlan1ip-address 2620:0:350:fc02:2c0:ffff:fe28:8787/64`
See also	remove ipv6-address set ipv6-network-parameters show ipv6-addresses show ipv6-network-parameters

add spares

Description	Designates specified available disks to be spares. A spare can replace a failed disk of the same type (enterprise SAS, for example) and the same or lower capacity in a disk group with a fault-tolerant RAID level other than ADAPT. If the disks in the system are FDE-capable, spares must also be FDE-capable. For virtual storage, all spares are global spares. For linear storage, you can add global spares or dedicated spares. A global spare is available to any non-ADAPT fault-tolerant disk group with the same disk type. The system supports a maximum of 64 global spares. However, the system will prevent adding global spares if only ADAPT disk groups exist. A dedicated spare is assigned to a non-ADAPT fault-tolerant linear disk group with the same disk type. A linear disk group can have 4 dedicated spares. **NOTE:** A disk group can contain a mix of 512-byte native sector size (512n) disks and 512-byte emulated sector size (512e) disks. For consistent and predictable performance, do not mix disks of different sector size types (512n, 512e). To add disks to a disk group to expand its capacity, use the expand disk-group command.
Minimum role	manage

Syntax	`add spares`
	`[disk-group disk-group]`
	`[vdisk vdisk]`

	disks
Parameters	`disk-group` *disk-group* Optional. The name or serial number of a linear disk group to assign the disks to as dedicated spares. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, the disks will be global spares. `vdisk` *vdisk* Optional. The name or serial number of the linear disk group to assign the disks to as dedicated spares. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, the disks will be global spares. *disks* The IDs of the disks to designate as spares. For disk syntax, see Command syntax.

Examples	Designate disk 1.2 as a global spare.
	`# add spares 1.2`
	Designate disk 1.3 as a dedicated spare for vdisk VD1.
	`# add spares vdisk VD1 1.3`
	Designate disk 1.3 as a dedicated spare for linear disk group dg1
	`# add spares disk-group dg1 1.3`

See also	remove spares show disk-groups show disks show vdisks

add storage

Description	Provisions disks into disk groups, according to rules defined by the storage-system manufacturer. In a new system, this command quickly provisions disks in enclosures so that you can proceed with creating and mapping volumes. In an existing system, this command quickly provisions unused disks in new and existing enclosures. If you specify the preview parameter, the command shows some or all of the following reference information, and not provision storage: • Suggestions to consider before provisioning, if any • A table of disk groups that can be added, if any • A table of ADAPT disk groups that can be expanded, if any • A table of unused disks, if any
Minimum role	manage

Syntax	`add storage`
	`[enclosure enclosure-IDs]`
	`[preview]`

Parameters	`enclosure enclosure-IDs`
	Optional. Limits provisioning to a specified enclosure. If this parameter is omitted, the command uses disks from all enclosures.
	`preview`
	Optional. Toggles between adding storage and displaying a possible storage configuration.

Examples	Add storage to the system.

	`# add storage`
	Add storage to a single enclosure.
	`# add storage enclosure 3`
	Preview a storage configuration which could be added.
	`# add storage preview`

Basetypes	adapt-expand-preview disk-groups-preview spares-preview storage-preview unused-disks-preview
See also	add disk-group add spares create vdisk show disks show disk-groups show pools show vdisks

add volume-group-members

Description	Adds virtual volumes to a volume group. To add a volume to a volume group, the volume must be in the same pool and have the same mappings as all other members of the group. This means that the volume must be mapped with the same access and port settings to the same initiators, hosts, or host groups. You cannot add a virtual volume to a volume group that is in a replication set.
Minimum role	manage

Syntax	`add volume-group-members`
	`volumes` *`volumes`*
	`volume-group`

Parameters	`volumes volumes`
	A comma-separated list of the names or serial numbers of virtual volumes to add to the specified volume group. A name that includes a space must be enclosed in double quotes.
	`volume-group`
	The name of an existing volume group. A name that includes a space must be enclosed in double quotes.

Examples	Add existing volumes `Vol0002` and `Vol0003` to existing volume group `VolumeGroup1`. `# add volume-group-members volumes Vol0002,Vol0003 VolumeGroup1`
See also	create volume-group remove volume-group-members show volume-groups show volumes

check firmware-upgrade-health

Description	Checks that the system is ready for a firmware upgrade. Under normal conditions, firmware upgrade can be performed safely without risk to data availability or integrity. However, when the system is degraded—for example, because of failed or missing components or lack of multipathing to disks—upgrade failure or loss of availability can occur. This command performs a series of health checks to determine whether any conditions exist that need to be resolved before upgrading firmware. Any conditions that are detected are listed with their potential risks. You can use commands in the "See also" section to determine which components have health problems to be resolved. For information about using the PowerVault Manager, SFTP, or FTP to update firmware, see the *Dell EMC PowerVault ME4 Series Storage System Administrator's Guide*.
Minimum role	manage
Syntax	`check firmware-upgrade-health`

Output	`Upgrade Health`
	`Pass`: There are no risks to performing firmware upgrade.
	`Fail`: At least one condition exists that presents a risk of upgrade failure or loss of availability.
	`Condition Detected`
	The condition that was detected.
	`Risks`
	The problems that are likely to result if you do not resolve the conditions before performing a firmware upgrade.

Examples	Check firmware upgrade health for a system that is ready for upgrade.
	`# check firmware-upgrade-health Upgrade Health`
	`----------`
	`Pass`
	`----------`
	Check firmware upgrade health for a system that has problems to be resolved before upgrade.
	`# check firmware-upgrade-health Upgrade Health`
	`----------`
	`Fail`
	`Condition Detected Risks`
	`----------`
	`One or more disks are currently single ported. Data unavailability`
	NOTE: ME4 Series systems support only dual-ported disks.
	`At least one controller is not up. Data unavailability`
	`One or more temperature sensors indicate a critical temperature. Code load failure`
	`At least one controller contains unwritten cache data. Data corruption, data loss`
	`One or more supercapacitors have failed. Code load failure`
	`One or more power supplies are not functioning. Code load failure`
	`One or more fans are not functioning. Code load failure`
	`One or vdisks are in a quarantied state. Code load failure`

Basetypes	code-load-readiness code-load-readiness-reason status
See also	show controllers show disk-groups show disks show enclosures show fans show power-supplies show sensor-status show system show vdisks

check support-assist

Description	Checks the connection from the storage system to the SupportAssist server.
Minimum role	manage
Syntax	`check support-assist`
Output	A message specifies whether the storage system can connect to the SupportAssist server and transmit data to it.
Examples	Check the connection from the storage system to the SupportAssist server. `# check support-assist`
See also	send support-assist-logs set support-assist set support-assist-info show support-assist

clear cache

Description	Clears unwritable cache data from both controllers. **NOTE:** If you are uncertain whether to use this command, contact technical support for assistance. This data cannot be written to disk because it is associated with a volume that no longer exists or whose disks are not online. If the data is needed, the volume's disks must be brought online. If the data is not needed it can be cleared, in which case it will be lost and data will differ between the host and disk. Unwritable cache is also called orphan data. **CAUTION: Only use this command when all disk groups are online and accessible from the host. Clearing cache for a volume that is offline or quarantined could result in data loss.** You can clear unwritable cache data for a specified volume or for all volumes
Minimum role	manage
Syntax	`clear cache` [volume *volume*]

Parameters	`volume volume` Optional. The name or serial number of a specific volume for which to clear unwritable cache data. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, unwritable cache data is cleared for all volumes.
Examples	Clear unwritable cache data for volume V1 from both controllers. `# clear cache volume v1`
See also	show unwritable-cache show volumes

clear disk-metadata

Description	Clears metadata from leftover disks. For a leftover disk, the `show disks` command shows the `Usage` value `LEFTOVR`. **CAUTION: Only use this command when all disk groups are online and leftover disks exist. Improper use of this command may result in data loss.** **NOTE:** If you are uncertain whether to use this command, contact technical support for assistance. Each disk in a disk group has metadata that identifies the owning disk group, the other members of the disk group, and the last time data was written to the disk group. The following situations cause a disk to become a *leftover*: • Disk group members' timestamps do not match so the system designates members having an older timestamp as leftovers. • A disk is not detected during a rescan, then is subsequently detected. When a disk becomes a leftover, the following changes occur: • The disk's health becomes `Degraded` and its `How Used` state becomes `LEFTOVR` • The disk is automatically excluded from the disk group, causing the disk group's health to become `Degraded` or `Fault`, depending on the RAID level. • The disk's fault LED becomes illuminated. If spares are available, and the health of the disk group is `Degraded`, the disk group will use spares to start reconstruction. When reconstruction is complete, you can clear the leftover disk's metadata. Clearing the metadata will change the disk's health to `OK` and its `How Used` state to `AVAIL`, making the disk available for use in a new disk group or as a spare. If spares are not available to begin reconstruction, or reconstruction has not completed, keep the leftover disk so that you'll have an opportunity to recover its data. This command clears metadata from leftover disks only. If you specify disks that are not leftovers, the disks are not changed.
Minimum role	manage
Syntax	`clear disk-metadata` *`disks`*
Parameters	`disks` The IDs of the leftover disks from which to clear metadata. For disk syntax, see Command syntax.
Examples	Clear metadata from leftover disk 1.1. `# clear disk-metadata 1.1`
See also	show disks

clear dns-parameters

Description	Clears configured DNS settings for each controller module.
Minimum role	manage
Syntax	`clear dns-parameters` `[controller a|b|both]`
Parameters	`controller a|b|both` Optional. Specifies whether to change controller A, B, or both. If this parameter is omitted, changes affect the controller being accessed.
Examples	Clear DNS settings for controller A. `# clear dns-parameters controller a`
See also	set dns-parameters set email-parameters show dns-parameters show email-parameters

clear events

Description	Clears the event log in controller A, B, or both.
Minimum role	manage
Syntax	`clear events` [a|b|both]
Parameters	`[a|b|both]` Optional. The controller event log to clear. If this parameter is omitted, both event logs are cleared.
Examples	Clear the event log for controller A. `# clear events a`
See also	show events

clear expander-status

Description	Clears the counters and status for SAS expander lanes. **NOTE:** This command is for use by or with direction from technical support. Counters and status can be reset to a good state for all enclosures, or for a specific enclosure whose status is Error as shown by the show expander-status command. **NOTE:** If a rescan is in progress, the clear operation will fail with an error message saying that an EMP does exist. Wait for the rescan to complete and then retry the clear operation.
Minimum role	manage
Syntax	`clear expander-status` `[enclosure ID]`
Parameters	[enclosure *ID*]

	Optional. The enclosure number. If this parameter is omitted, the command clears the counters and status of all enclosures.
Examples	Clear the expander status for the enclosure with ID `1`. `# clear expander-status enclosure 1`
See also	show expander-status

clear fde-keys

Description	Clears the lock key ID and import lock ID used with Full Disk Encryption. Use this command to temporarily deny access to data on the disks during a period when the system will not be under your physical control. If the lock keys are cleared while the system is secured, the system enters the `Secured, Lock Ready` state, in preparation for the system being powered off and transported. No further FDE configuration is allowed until the system has been power that is cycled. Disks remain in the `Secured, Unlocked` state until they are power that is cycled. After the system has been transported and powered on, the system and disks will enter the `Secured, Locked` state; and volumes will become inaccessible. To restore access to data, re-enter the original passphrase by using the set fde-lock-key command.
Minimum role	manage
Syntax	`clear fde-keys` `[current-passphrase value]`
Parameters	`[current-passphrase value]` Optional. If the system is secured, you can provide the current passphrase as part of the command. If this parameter is omitted, the command prompts you for the current passphrase.
Examples	Clear the lock keys in preparation for shipping a system to a new location. `# clear fde-keys current-passphrase myPassphrase`
See also	set fde-import-key set fde-lock-key set fde-state show fde-state

clear fenced-data

Description	Clears fenced data blocks from a specified disk group. If the specified disk group has no fenced data, the command returns an error and the disk group is not affected.
Minimum role	monitor

Syntax	`clear fenced-data`
	`[disk-group disk-group]`
	`[vdisk vdisk]`

Parameters	`disk-group disk-group`
	Optional. The name or serial number of a virtual disk group. A value that includes a space must be enclosed in double quotes.
	`vdisk vdisk`

	Optional. The name or serial number of a linear disk group. A name that includes a space must be enclosed in double quotes.
Examples	Clear fenced data for disk group `ar5`. `# clear fenced-data disk-group ar5`
See also	show fenced-data

clear replication-queue

Description	Clears the replication queue for a specified replication set. If a replication request is initiated for a replication set that is already running a replication, and the replication set's queue policy is `Queue Latest`, the new replication request will be queued. A maximum of one replication can be queued. If a queued replication is removed, event 587 will be logged with Informational severity.
Minimum role	manage
Syntax	`clear replication-queue` *`replication-set-ID`*
Parameters	*`replication-set-ID`* The name or serial number of the replication set. A name that includes a space must be enclosed in double quotes.
Examples	Clear the replication queue for replication set `RepSet1`. `# clear replication-queue RepSet1`
See also	create replication-set set replication-set

clear support-assist-proxy

Description	Clears configured SupportAssist Proxy settings.
Minimum role	manage
Syntax	clear support-assist-proxy
Examples	Clear SupportAssist Proxy settings. `# clear support-assist-proxy`
See also	check support-assist send support-assist-logs set support-assist set support-assist-info show support-assist

copy volume

Description	Copies all data in a specified source volume to a destination volume.

	The source volume can be a virtual base volume or a virtual snapshot. The destination volume will be completely independent of the source volume and will have a different serial number. The destination volume will be created with the default attributes of a standard volume and will not inherit settings, such as snapshot-retention settings, from the source volume, You can use this command to: ● Copy a base volume to a new base volume. ● Promote a snapshot to a base volume to make the snapshot independent of its parent volume. ● Copy a volume from one pool to another. Reasons to promote a snapshot include: ● You want to delete the snapshot's base volume without losing the data in the snapshot. ● You want to set a different tier preference for a snapshot than for its parent (or for another snapshot in the same tree). ● You don't want the volume's unique data to be counted against overall pool snapshot space (because it might cause deletion of other snapshots). ● The volume's snapshot tree is full and no more snapshots can be taken, but you don't want to delete any snapshots. Instead, you can promote them. ● The volume's purpose has changed and is no longer considered a subordinate volume. ● You want to balance usage between the two pools, by copying a volume from one pool to the other and then deleting the volume from the source pool. To ensure the data integrity of the destination volume, unmount and unmap the source volume from host access before starting the copy operation. When the copy operation is complete, mount the destination volume and test to ensure that it is functional. Then you may remount the source volume —or if it's no longer needed, delete it. To see the progress of a volume copy operation, use the show volume-copies command. During a copy operation: ● Progress will be periodically logged to allow it to resume if it is interrupted by controller failover or failure. ● The source volume and destination volume cannot be deleted. ● If the source volume or the destination volume fails, the copy operation will fail and be automatically canceled, the destination volume will be automatically deleted, and event 267 will be logged with Error severity. ● If the destination pool runs out of space, or the destination volume was not created due to a shortage of physical storage in a non-thin-provisioned system, the copy operation will fail and be automatically canceled, the destination volume will be automatically deleted, and event 267 will be logged with Error severity.
Minimum role	manage

Syntax	`copy volume`
	
	`[destination-pool` *`destination-pool-ID`*`]`
	
	`name` *`destination-volume-name`*
	
	`source-volume-ID`

Parameters	`destination-pool` *`destination-pool-ID`*
	
	Optional. The name or serial number of the virtual pool in which to create the destination volume. This must be the pool that contains the source volume, and can be either pool in the system. If this parameter is omitted, the destination volume will be created in the same pool as the source volume.
	
	`name destination-volume-name`
	
	A name for the volume to create in the destination pool. Input rules:
	● The value is case sensitive.
	● The value can have a maximum of 32 bytes.
	● The value can include spaces and printable UTF-8 characters except: " , < \
	● A value that includes a space must be enclosed in double quotes.
	
	`source-volume-ID`

	The name or serial number of the source volume to copy. A name that includes a space must be enclosed in double quotes.
Examples	Copy volume `SourceVol` in pool A to new volume `DestVol` in pool B. `copy volume SourceVol destination-pool B name DestVol`
See also	abort copy show pools show volume-copies show volumes

create certificate

Description	Creates or removes a custom security certificate. The storage system supports use of unique certificates for secure data communications, to authenticate that the expected storage systems are being managed. Use of authentication certificates applies to the HTTPS protocol, which is used by the web server in each controller module. The PowerVault Manager and SMI-S interfaces use the same certificate. After using this command you must restart each Management Controller to which the change is applied to have the change take effect
Minimum role	manage

Syntax	`create certificate`
	`[a|b|both]`
	`[contents` *`content-string`*`]`
	`[noprompt]`
	`[restore]`
	`[unique]`

Parameters	`a|b|both`
	Optional. Specifies whether to apply the change to controller A, B, or both. If this parameter is omitted, the change is applied to the controller being accessed.
	`contents content-string`
	Optional. A security certificate is generated based on the supplied content. The content becomes the subject of the certificate creation request and must be formatted as `/type0=value0/type1=value1/type2=...,` where types include C for country, ST for state or province, L for location, CN for common name, and O for organization. Invalid types will be omitted from the content string. The content string cannot exceed 1024 characters and can include printable UTF-8 characters except space or semicolon. An example is `/C=US/ST=CO/O=MyOrganization/CN=www.mysite.com`. You must specify either this parameter or the restore parameter or the unique parameter.
	`noprompt`
	Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.
	`restore`
	Optional. The system-generated certificate is restored and the custom certificate is discarded. The custom certificate may have been created with this CLI command or uploaded using SFTP or FTP. You must specify either this parameter or the `contents` parameter or the `unique` parameter.
	`unique`

	Optional. A security certificate is generated based on the system's serial number and other standard values. This certificate is installed, and the original certificate is archived. You must specify either this parameter or the `contents` parameter or the `restore` parameter.

Examples	Regenerate the system certificate with a new private key.
	`# create certificate unique`
	Create a custom certificate using a content string.
	`# create certificate contents /C=US/ST=CO/L=NewYork/O=MyCompany/CN=www.mycompany.com`
	Restore the system-generated certificate and remove the custom certificate.
	`# create certificate restore`

See also	restart mc restart sc show certificate

create chap-record

Description	Creates a CHAP record to authenticate iSCSI login requests. When CHAP is enabled, the record enables authentication between the originator (initiator) and recipient (target) of a login request. This command is permitted whether or not CHAP is enabled. **NOTE:** For information about setting up CHAP for use in a peer connection, see the topic about creating a peer connection in the *Dell EMC PowerVault ME4 Series Storage System Administrator's Guide*. The CHAP record can specify one name-secret pair to authenticate the originator only (one-way CHAP) or two pairs to authenticate both the originator and the recipient (mutual CHAP). For a login request from an initiator to a storage system, the initiator is the originator and the storage system is the recipient. Because CHAP works during login, to make CHAP changes take effect you must reset any active iSCSI host links. In a peer connection, a storage system can act as the originator or recipient of a login request. As the originator, with a valid CHAP record it can authenticate CHAP even if CHAP is disabled. This is possible because the system will supply the CHAP secret requested by its peer and the connection will be allowed.
Minimum role	manage

Syntax	`create chap-record`
	`name` *`originator-name`*
	`secret` *`originator-secret`*
	`[mutual-name` *`recipient-name`* `mutual-secret` *`recipient-secret`*`]`

Parameters	`name` *`originator-name`* The originator name, typically in IQN format. The name is case sensitive and can have a maximum of 223 bytes, including 0–9, lowercase a–z, hyphen, colon, and period `secret` *`originator-secret`* The secret that the recipient uses to authenticate the originator. The secret is case sensitive and can include 12–16 bytes. The value can include spaces and printable UTF-8 characters except: " < `mutual-name` *`recipient-name`* Optional; for mutual CHAP only. The recipient name, typically in IQN format. The name is case sensitive and can have a maximum of 223 bytes, including 0–9, lowercase a–z, hyphen, colon, and

	period. To determine a storage system's IQN, use the show ports command to view the Target ID value for an iSCSI port. This parameter and mutual-secret must be set together. `mutual-secret recipient-secret` Optional; for mutual CHAP only. The secret that the originator uses to authenticate the recipient. The secret is case sensitive, can include 12–16 bytes, and must differ from the originator secret. The value can include spaces and printable UTF-8 characters except: " < A storage system's secret is shared by both controllers. This parameter and `mutual-name` must be set together.
Examples	Create a one-way CHAP record to enable a storage system to authenticate a host initiator. `# create chap-record name iqn.1991-05.com.microsoft:myhost.domain secret 123456abcDEF`
See also	delete chap-records set chap-record show chap-records show iscsi-parameters show ports

create host

Description	Creates a host with an associated name. You can use the `create host` command to create a host that groups together specified initiators, and optionally to add the host to a host group. You can create a maximum of 512 hosts, each containing a maximum of 128 initiators. To create a single initiator, use the set initiator command.
Minimum role	manage

Syntax	`create host`
	`[host-group` *`host-group`*`] [initiators` *`initiators`*`]`
	`[profile standard]`
	`name`

Parameters	`host-group` *`host-group`*
	Optional. The name of an existing host group to which to add the new host.
	`initiators` *`initiators`*
	A comma-separated list of initiator names, IDs, or both, with no spaces
	For FC, the ID is a WWPN. For SAS, the ID is a WWPN. For iSCSI, the ID is an IQN. A WWPN can include a colon between each byte but the colons will be discarded.
	`profile standard`
	Optional. Default profile.
	`name`
	A name for the host. Input rules:
	● The value is case sensitive.
	● The value can have a maximum of 32 bytes.
	● The value can include spaces and printable UTF-8 characters except: " , . < \
	● A value that includes a space must be enclosed in double quotes.

Examples	Create host `Host1` that includes two FC initiators

	`# create host initiators 10000090fa13870e,10000090fa13870f Host1`
	Create host `Host2` that includes two iSCSI initiators.
	`# create host initiators iqn.1992-01.com.example:storage.host2.port1, iqn.1992-01.com.example:storage.host2.port2 Host2`
	Create host `Host4` by pasting a WWPN that includes colons.
	`# create host initiators 20:70:00:c0:ff:d7:4c:07 Host4`

See also	set host set initiator show host-groups show initiators

create host-group

Description	Creates a host group that includes specified hosts. You can create a maximum of 32 host groups, each containing a maximum of 256 hosts.
Minimum role	manage
Syntax	`create host-group` `hosts` *`hosts`* *`host-group`*
Parameters	`hosts` *`hosts`* A comma-separated list of the names of hosts to include in the host group. A name that includes a space must be enclosed in double quotes. `host-group` A name for the host group. Input rules: • The value is case sensitive. • The value can have a maximum of 32 bytes. • The value can include spaces and printable UTF-8 characters except: " , . < \ • A value that includes a space must be enclosed in double quotes.
Examples	Create a host group named `HostGroup1` that includes hosts `Host1` and `Host2`. `# create host-group hosts Host1,Host2 HostGroup1`
See also	add host-group-members delete host-groups remove host-group-members set host-group show host-groups

create peer-connection

Description	Creates a peer connection between two storage systems. The peer connection is defined by the ports that connect the two peer systems, and the name of the peer connection. The local system uses the remote address to internally run the query peer-connection command. The results of the query are used to configure the peer connection. The prerequisites to create a peer connection are:

	• Both systems must have iSCSI or FC host ports. Ports at both ends of the connection must use the same protocol. • Both systems must be connected to the same fabric or network. For FC, at least one FC switch is required between systems (no direct attach). • All host port addresses in both systems must be unique, even for ports not in use. • Each system must have a virtual pool. • If iSCSI CHAP is configured for the peer connection, the authentication must be valid. • The username and password of a user with the manage role on the remote system must be specified. You can create a maximum of four peer connections per storage system. However, only one peer connection is allowed to a particular remote system. Attempting to create a second peer connection to the same system fails. Host port evaluation is done at the start or resumption of each replication operation. • At most, two ports are used. • Ports with optimized paths are used first. If no optimized path exists, ports with unoptimized paths are used . If only one port has an optimized path, then only that port is used. • The replication does not use another available port until all used ports become unavailable. If a single host port loses connectivity, event 112 is logged. Because a peer connection is likely to be associated with multiple host ports, the loss of a single host port may degrade performance. The loss of a single port but does not usually cause the peer connection to be inaccessible.
Minimum role	manage

Syntax	`create peer-connection`
	`[remote-password` *`password`*`]`
	`remote-port-address` *`remote-port-address`*
	`remote-username` *`username name`*

Parameters	`remote-password` *`password`* Optional in console format; required for API format. The password of the user is specified by the `remote-username` parameter. If this parameter is omitted, the command prompts you to enter and reenter a value, which is displayed obscured for security reasons. `remote-port-address` *`remote-port-address`* Specifies the FC WWN or iSCSI IP address of the remote system with which to create a peer connection `remote-username` *`username`* The name of a user in the remote system. The username must be a user with the manage role to remotely configure or provision that system. *`name`* Specifies a name for the peer connection. Input rules: • The value is case-sensitive. • The value can have a maximum of 32 bytes. • The value can include spaces and printable UTF-8 characters except: " , < \ • A value that includes a space must be enclosed in double quotes.

Examples	On a storage system that will replicate using iSCSI to a second system, create peer connection `Peer1` to remote port address 192.168.200.22, using the credentials of remote user `John`.
	`# create peer-connection remote-port-address 192.168.200.22 remote-username John remote-password P@ssw0rd Peer1`
	On a storage system that will replicate using FC to a second system, create peer connection `Peer2` to remote port address 247000c0ff1a45b8, using the credentials of remote user `Admin1`.
	`# create peer-connection remote-port-address 247000c0ff1a45b8 remote-username Admin1 Peer2 Enter remote password: *******`
	`Re-enter remote password: *******`

See also	delete peer-connection query peer-connection set peer-connection show peer-connections

create replication-set

Description	Creates a replication set for a specified volume or volume group. This command is not applicable to a system with SAS controller modules. Linear replication sets and virtual peer connections and replication sets cannot exist on a system simultaneously. For the maximum number of replication sets that can be created, see the "System configuration limits" topic in the PowerVault Manager help. This command designates the specified source volume or volume group as the primary volume or volume group. This command also creates the secondary volume or volume group, and creates the internal snapshots that are required to support replications. ● A replication set for a volume consumes two internal snapshots each for the primary volume and the secondary volume if the queue policy is set to `discard`, or three each if the queue policy is set to `queue-latest`. ● A replication set for a volume group consumes two internal volume groups if the queue policy is set to `discard`, or three if the queue policy is set to `queue-latest`. Each internal volume group contains a number of volumes equal to the number of volumes in the base volume group. Internal snapshots and internal volume groups count against system limits, but do not display. A peer connection must already be defined to create and use a replication set. The command fails if the secondary volume names exist, or if the local system cannot reach the remote system. Secondary volumes cannot be mapped, moved, expanded, deleted, or participate in a rollback operation. Create a snapshot of the secondary volume, and use the snapshot for mapping and accessing data. A volume or volume group can belong to only one replication set. If the volume group is already in a replication set, individual volumes may not be included in separate replication sets. The maximum number of individual volumes that can be replicated is 32. If a volume group is being replicated, the maximum number of volumes that can exist in the group is 16. A replication set can be configured to maintain a replication snapshot history. As part of handling a replication, the replication set will automatically take a snapshot of the primary and/or secondary volumes, thereby creating a history of data that has been replicated over time. This feature can be enabled for a secondary volume or for a primary volume and its secondary volume, but not for a volume group. When this feature is enabled: ● For a primary volume, when a replication starts it creates a snapshot of the data image being replicated. ● For a secondary volume, when a replication successfully completes it creates a snapshot of the data image that is just transferred to the secondary volume. (This is in contrast to the primary volume snapshot, which is created before the sync.) If replication does not complete, a snapshot is not created. ● The snapshots are named *basename_nnnn*, where *nnnn* starts at 0000 and increments for each subsequent snapshot. If primary-volume snapshots are enabled, snapshots with the same name will exist on the primary and secondary systems. The snapshot number is incremented each time that a replication is requested, whether the replication completes. For example, if the replication was queued and removed later from the queue. ● You can set the number of snapshots to retain, referred to as the snapshot count. This setting applies to management of snapshots for both the primary and secondary volume. When the snapshot count is exceeded, the oldest unmapped snapshot will be discarded automatically. If you reduce the snapshot count setting (by using the set replication-set command) to a value less than the current number of snapshots, the command will be rejected. Thus, you must manually delete the excess snapshots before reducing the snapshot count setting

	• If the replication set is deleted, any existing snapshots that are automatically created by snapshot history rules are not deleted. You can manage those snapshots like any other snapshots.
	• Manually creating a snapshot does not increase the snapshot count that is associated with the snapshot history. Manually created snapshots are not managed by the snapshot history feature. If a volume already exists with the name of the snapshot that is intended to be taken, the snapshot will not occur, and the snapshot number is incremented.
	• A snapshot that is created by this feature is counted against the system-wide maximum snapshots limit, with the following result:
	  ○ If the snapshot count is reached before the system limit, then the snapshot history is unchanged.
	  ○ If the system limit is reached before the snapshot count, then the snapshot history stops adding or updating snapshots.
	• A mapped snapshot-history snapshot will not be deleted until after it is unmapped.
	• The snapshot-basename and snapshot-count settings only take effect when snapshot-history is set to secondary or both, although these settings can be changed at any time.

Minimum role	manage

Syntax	`create replication-set`
	`peer-connection peer-connection-ID`
	`primary-address ip= IPs|wwnn= WWNNs]`
	`primary-volume volume-ID | volume-group-ID`
	`[queue-policy discard|queue-latest]`
	`[secondary-pool A|B]`
	`[secondary-volume-name name]`
	`[snapshot-basename basename]`
	`[snapshot-count #]`
	`[snapshot-history disabled|off|secondary|both]`
	`[snapshot-retention-priority never-delete|high|medium|low]`
	`name`

Parameters	`peer-connection peer-connection-ID`
	Specifies the name or serial number of the peer connection on which to create the replication set
	`primary-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs`
	Optional. Specifies host ports in the local system by IP address, World Wide Node Name, or World Wide Port Name. An IP address value can include a port number. For example, `10.134.2.1:3260`. Multiple values must be separated by commas and no spaces. For example: `ip=10.134.2.1,10.134.2.2`.
	`primary-volume volume-ID|volume-group-ID`
	Specifies the name or serial number of a volume or volume group on the local system. Volume-groups must be specified with the name and `.*` notation used in mapping.
	`queue-policy discard|queue-latest`
	Optional. Specifies the action to take when a replication is running and a new replication is requested.
	• `discard`: Discard the new replication request.
	• `queue-latest`: Take a snapshot of the primary volume and queue the new replication request. If the queue contained an older replication request, discard that older request. A maximum of one replication can be queued. This is the default.
	NOTE: If the queue policy is `queue-latest` and a replication is running and another is queued, you cannot change the queue policy to `discard`. The queued replication must be manually removed before you can change the policy.
	`secondary-pool A|B`

	Optional. Specifies an existing virtual pool on the remote peer. If this is not specified, the system uses the corresponding pool on the remote system. For example, if pool A is used on the local system, pool A is used on the remote system. If this is not specified and the corresponding pool on the remote side does not exist, this command fails.
	`secondary-volume-name` *name*
	Optional. Specifies a name for the secondary volume. If this is not specified, the name from the primary volume is used. For volume-group targets, all contained volume names must be unique. Input rules:
	● The value is case-sensitive.
	● The value can have a maximum of 32 bytes.
	● The value can include spaces and printable UTF-8 characters except: " , < \
	● A value that includes a space must be enclosed in double quotes.
	There is no default.
	`snapshot-count #`
	Optional if `snapshot-history` is set to `disabled` or `off`. Required if `snapshot-history` is set to `secondary` or `both`.
	Specifies the number of snapshots that are taken of the replication volume to retain, from 1 to 16. When a new snapshot exceeds this limit, the oldest snapshot in the snapshot history is deleted.
	The snapshot-count setting can be changed at any time. Its value must be greater than the number of existing snapshots in the replication set, regardless of whether `snapshot-history` is enabled.
	`snapshot-history disabled|off|secondary|both`
	Optional. Specifies whether to maintain a replication snapshot history for the replication set, as previously described.
	● `disabled` or `off`: A snapshot history is not kept. If this parameter is disabled after a replication set has been established, any existing snapshots will be kept, but not updated. This option is the default.
	● `secondary`: A snapshot history set is kept on the secondary system for the secondary volume, using `snapshot-count` and `snapshot-basename` settings.
	● `both`: A snapshot history is kept for the primary volume on the primary system and for the secondary volume on the secondary system. Both snapshot histories use the same `snapshot-count` and `snapshot-basename` settings
	`snapshot-retention-priority never-delete|high|medium|low`
	Optional. For virtual storage, this specifies the retention priority for history snapshots, which is used when automatic deletion of snapshots is enabled by using the "set snapshot-space" command. In a snapshot tree, only leaf snapshots can be deleted automatically. Deletion of snapshots based on retention priority is unrelated to deleting the oldest snapshots to maintain a snapshot count.
	● `never-delete`: Snapshots are never automatically deleted to make space. The oldest snapshot in the snapshot history is deleted once the snapshot-count has been exceeded. This is the default.
	● `high`: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted.
	● `medium`: Snapshots can be deleted after all eligible low-priority snapshots have been deleted.
	● `low`: Snapshots can be deleted.
	`name`
	Specifies a name for the replication set. Input rules:
	● The value is case-sensitive.
	● The value can have a maximum of 32 bytes.
	● The value can include spaces and printable UTF-8 characters except: " , < \
	● A value that includes a space must be enclosed in double quotes.

Examples	Create replication set RS1 for primary volume `Vol1` on the peer connection `Peer1`.
	`# create replication-set peer-connection Peer1 primary-volume Vol1 RS1`
	Create replication set `RS1` for volume group `VG1.*` on the peer connection `Peer1`.
	`# create replication-set peer-connection Peer1 primary-volume VG1.* RS1`

	Create replication set `repset2` for volume `vol2` on peer-connection `Lab`; specify that the system cannot automatically delete history snapshots in this set; and enable snapshot history for both the primary volume and the secondary volume, allowing up to 5 replication snapshots with the basename `repsnapvol2` to be retained for each volume. `# create replication-set peer-connection Lab primary-volume vol2 secondary-pool A snapshot-retention-priority never-delete snapshot-history both snapshot-basename repsnapVol2 snapshot-count 5 repset2`
See also	delete replication-set resume replication-set set replication-set show replication-sets suspend replication-set

create schedule

Description	Schedules a task to run automatically. You can schedule a replication task on the replication set of the primary system only.
Minimum role	manage

Syntax	`create schedule`
	`schedule-specification "`*`specification`*`"`
	`task-name` *`task-name`*
	`schedule-name`

Parameters	`schedule-specification "`*`specification`*`"` Defines when the task first runs, and optionally when it recurs and expires. You can use a comma to separate optional conditions. Dates cannot be in the past. For times, if `AM` or `PM` is not specified, a 24-hour clock is used. • `start` *`yyyy-mm-dd hh:mm`*`[AM|PM]` Specifies a date and time to be the first instance when the scheduled task runs, and to be the starting point for any specified recurrence. • `[every # minutes|hours|days|weeks|months|years]` Specifies the interval at which the task runs. For better performance when scheduling a `TakeSnapshot` task that runs under heavy I/O conditions or on more than three volumes, the retention count and the schedule interval should be set to similar values. For example if the retention count is 10 then the interval should be set to 10 minutes. For a `Replicate` task, the minimum interval is 30 minutes • `[between` *`hh:mm`*`[AM|PM] and` *`hh`*`:mm[AM|PM]]` Constrains the time range during which the task is permitted to run. Ensure that the start time is within the specified time range. • `[only any|first|second|third|fourth|fifth|last|#st|#nd|#rd|#th day| weekday|weekendday| Sunday|Monday|Tuesday|Wednesday|Thursday|Friday| Saturday of year|month|January|February| March|April|May|June|July| August|September|October|November|December]` Constrains the days or months when the task is permitted to run. Ensure that this constraint includes the start date. • `[count #]`

	Constrains the number of times the task is permitted to run.
	• `[expires yyyy-mm-dd hh:mm[AM|PM]]`
	Specifies when the schedule expires, after which the task no longer runs.
	`task-name task-name`
	The name of an existing task to run. The name is case-sensitive. A name that includes a space must be enclosed in double quotes.
	`schedule-name`
	A name for the new schedule. Input rules:
	• The value is case-sensitive.
	• The value can have a maximum of 32 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , < \
	• A value that includes a space must be enclosed in double quotes.

Examples	Create schedule `Sched1` that runs `Task1` for the first time on March 1, 2018, runs daily between midnight and 1:00 AM, and runs for the last time in the morning of Jan 1, 2019.
	`# create schedule schedule-specification "start 2018-03-01 00:01, every 1 days, between 12:00 AM and 1:00 AM, expires 2019-01-01 1:00 AM" task-name Task1 Sched1`
	Create schedule `Sched2` that runs `Task2` for the first time on March 1, 2019, and on the first weekday of each month, with no expiration.
	`# create schedule schedule-specification "start 2019-03-01 00:01 only first weekday of month" task-name Task2 Sched2`

See also	delete schedule set schedule show schedules show tasks

create snapshots

Description	Creates a snapshot of each specified source volume. This command applies to virtual storage only. The source volume can be a base volume or a snapshot.
Minimum role	manage

Syntax	`create snapshots`
	`volumes volumes`
	`snap-names`

Parameters	`volumes volumes`
	A comma-separated list of the names or serial numbers of 1 to 16 source volumes of which to create snapshots. A name that includes a space must be enclosed in double quotes.
	`snap-names`
	A comma-separated list of names for the resulting snapshots. Snapshot names must be unique system-wide. Input rules:
	• The value is case-sensitive.
	• The value can have a maximum of 32 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , < \
	• A value that includes a space must be enclosed in double quotes.

Examples	Create snapshots of volumes V4 and V5.

	`# create snapshots volumes V4,V5 V4snap,V5snap`
See also	show snapshots show volumes

create task

Description	Creates a task that can be scheduled. You can create a task to: • Enable drive spin down for spinning disks. The disks cannot be in a virtual pool. The disks cannot be using ADAPT data protection. You can use this to enable or resume spin down during hours of infrequent activity. When drive spin down is enabled, disks will spin down after 60 minutes of inactivity by default. • Disable drive spin down. You can use this to disable or suspend spin down during hours of frequent activity. • Create a snapshot of a source volume, which can be a virtual base volume or a virtual snapshot. • Reset a snapshot. This deletes the data in the snapshot and resets it to the current data in the volume from which the snapshot was created. The snapshot's name and other volume characteristics are not changed. • Replicate a virtual replication set's primary volume or volume group to a peer system **CAUTION: Before scheduling a `ResetSnapshot` task, consider that if the snapshot is mounted/presented/mapped to a host, the snapshot must be unmounted/unpresented/unmapped before the reset is performed. Leaving it mounted/presented/mapped can cause data corruption. You should create a scheduled job on the host to unmount/unpresent/unmap the snapshot prior to resetting it.**
Minimum role	manage

Syntax	To create a task to take a snapshot:
	`create task`
	`retention-count #`
	`snapshot-prefix` *`prefix`*
	`source-volume` *`volume`*
	`type TakeSnapshot`
	`name`
	To create a task to reset a snapshot:
	`create task`
	`snapshot-volume` *`volume`*
	type **ResetSnapshot**
	`name`
	To create a task to replicate a virtual volume:
	`create task`
	`[last-snapshot]`
	`replication-set` *`replication-set-ID`*
	type **Replicate**
	`name`
	To create a task to enable spin down:
	`create task`
	type **EnableDSD**

	name To create a task to disable spin down: `create task` type **DisableDSD** *name*

Parameters	`last-snapshot`
	Optional. For a Replicate task this specifies to replicate the most recent snapshot of the primary volume. This snapshot may have been created either manually or by the snapshot history feature
	`replication-set` *replication-set-ID*
	For a Replicate task this specifies the ID of the replication set to replicate.
	`retention-count #`
	For a `TakeSnapshot` task this specifies the number of snapshots created by this task to retain, from 1 to 8 if the large-pools feature is enabled, or from 1 to 16 if the large-pools feature is disabled. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted
	`snapshot-prefix prefix`
	For a `TakeSnapshot` task this specifies a label to identify snapshots created by this task. Input rules:
	● The value is case sensitive.
	● The value can have a maximum of 26 bytes.
	● The value can include spaces and printable UTF-8 characters except: " , . < \
	● A value that includes a space must be enclosed in double quotes.
	`snapshot-volume` *volume*
	For a `ResetSnapshot` task this specifies the name or serial number of the snapshot to reset. A name that includes a space must be enclosed in double quotes.
	`source-volume` *volume*
	For a `TakeSnapshot` task this specifies the name or serial number of the source volume of which to take a snapshot. A name that includes a space must be enclosed in double quotes.
	type `TakeSnapshot|ResetSnapshot|Replicate|EnableDSD|DisableDSD`
	The task type:
	● `TakeSnapshot`: Creates a snapshot.
	● `ResetSnapshot`: Resets the data in a snapshot.
	● `Replicate`: Replicates a virtual replication set's primary volume or volume group to a peer system.
	● `EnableDSD`: Enables drive spin down.
	● `DisableDSD`: Disables drive spin down.
	● *name*
	A name for the new task. Input rules:
	● The value is case sensitive.
	● The value can have a maximum of 32 bytes.
	● The value can include spaces and printable UTF-8 characters except: " , . < \
	● A value that includes a space must be enclosed in double quotes.

Examples	Create task Snap that creates a snapshot of volume `VD1_V1` and retains only the latest four snapshots with the prefix `VD1_V1` (for example, `VD1_V1_S0001`).
	`# create task type TakeSnapshot source-volume VD1_V1 snapshot-prefix VD1_V1 retention-count 4 Snap`
	Create task `Reset` that resets snapshot `VD1_V1_S0001`.
	`# create task type ResetSnapshot snapshot-volume VD1_V1_S0001 Reset`

	Create task `replicateRS1` that replicates virtual replication set `RS1`'s primary volume or volume group`# create task type Replicate replication-set RS1 replicateRS1`
	Create task `replicateRS2` that replicates the newest snapshot of virtual replication set `RS2`'s primary volume or volume group
	# create task type Replicate replication-set RS2 replicateRS2 last-snapshot
	Create task `taskDSDresume` to enable or resume spin down.
	`# create task type EnableDSD taskDSDresume`
	Create task `taskDSDsuspend` to disable or suspend spin down.
	`# create task type DisableDSD taskDSDsuspend`

See also	create schedule delete task set task show tasks show volumes

create user

Description	Creates a user account. The system supports 12 user accounts. You can create a standard user that can access the PowerVault Manager, CLI, SFTP, or FTP interface. You can also create an SNMPv3 user that can access the MIB or receive trap notifications. SNMPv3 user accounts support SNMPv3 security features such as authentication and encryption.
Minimum role	manage

Syntax	`create user`
	`[authentication-type MD5|SHA|none]`
	`[base 2|10]`
	`[interfaces` *`interfaces`*`]`
	`[locale English|en|Spanish|es|French|fr|German|de|Japanese|ja|Korean|ko|Chinese-simplified| zh-s]`
	`[password` *`password`*`]`
	`[precision #]`
	`[privacy-password` *`encryption-password`*`]`
	`[privacy-type DES|AES|none]`
	`[roles` *`roles`*`]`
	`[storage-size-base 2|10]`
	`[storage-size-precision #]`
	`[storage-size-units auto|MB|GB|TB]`
	`[temperature-scale celsius|c|fahrenheit|f]`
	`[timeout #]`
	`[trap-host` *`address`*`]`
	`[type novice|standard|advanced|diagnostic]`
	`[units auto|MB|GB|TB]`
	`name`

Parameters	`authentication-type MD5|SHA|none`

Optional. For an SNMPv3 user, this specifies whether to use a security authentication protocol. Authentication uses the user password.

- `MD5`: MD5 authentication. This is the default.
- `SHA`: SHA-1 authentication.
- `none`: No authentication.

`base 2|10`

Optional. Sets the base for entry and display of storage-space sizes:

- `2`: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude. In base 2 when you set a size, whether you specify a base-2 or base-10 size unit, the resulting size is in base 2
- `10`: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. In base 10 when you set a size, the resulting size is in the specified unit. This option is the default.

Operating systems usually show volume size in base 2. Disk drives usually show size in base 10. Memory (RAM and ROM) size is always shown in base 2.

`interfaces` *`interfaces`*

Optional. Specifies the interfaces that the user can access. Multiple values must be separated by commas and no spaces. A command that specifies `snmpuser` or `snmptarget` cannot also specify a non-SNMP interface.

- `cli`: Command-line interface. This is enabled by default.
- `wbi`: PowerVault Manager web-browser interface. This is enabled by default.
- `ftp`: FTP or SFTP interface.
- `smis`: Storage Management Initiative Specification (SMI-S) interface. Not supported for a system with 5U84 enclosures.
- `snmpuser`: Allows an SNMPv3 user to view the SNMP MIB.
- `snmptarget`: Allows an SNMPv3 user to receive SNMP trap notifications. This option requires the `trap-host` parameter.
- `none`: No interfaces.

The `smis` option is not supported for a user with the `monitor` or `diagnostic` role. A command that specifies `snmpuser` or `snmptarget` cannot also specify a non-SNMP interface. To enable or disable interface protocols, use the set protocols command.

`locale English|en|Spanish|es|French|fr|German|de|Japanese|ja|Korean|ko|Chinese-simplified|zh-s`

Optional. The display language. The default is English.

`password` *`password`*

Optional in console format; required for API format. Sets a new password for the user. Input rules:

- The value is case-sensitive.
- The value can have 8 to 32 characters..
- The value can include spaces and printable UTF-8 characters except: " , . < \
- A value that includes only printable ASCII characters must include at least one uppercase character, one lowercase character, one numeric character, and one non-alphanumeric character.

If this parameter is omitted, the command prompts you to enter and re-enter a value, which is displayed obscured for security reasons. For an SNMPv3 user whose `authentication-type` parameter is set to use authentication, this specifies the authentication password.

`precision #`

Optional. Sets the number of decimal places (1–10) for display of storage-space sizes.

`privacy-password` *`encryption-password`*

Optional. For an SNMPv3 user whose `privacy-type` parameter is set to use encryption, this specifies the encryption password. Input rules:

- The value is case-sensitive.
- The value can have 8 to 32 characters.
- The value can include spaces and printable UTF-8 characters except: `" , . < \`
- A value that includes only printable ASCII characters must include at least one uppercase character, one lowercase character, one numeric character, and one non-alphanumeric character.

`privacy-type DES|AES|none`

Optional. For an SNMPv3 user, this specifies whether to use a security encryption protocol. This parameter requires the `privacy-password` parameter and the `authentication-type` parameter.

- `DES`: Data Encryption Standard.
- `AES`: Advanced Encryption Standard.
- `none`: No encryption. This is the default.

`roles` *`roles`*

Optional. Specifies the user roles as one or more of the following values:

- `monitor`: User can view but not change system settings. This is the default.
- `manage`: User can view and change system settings.
- `diagnostic`: User can view and change system settings.

Multiple values must be separated with a comma (with no spaces). If multiple values are specified, the access to commands is determined by the highest role specified.

`storage-size-base 2|10`

Optional. Alias for `base`.

`storage-size-precision #`

Optional. Alias for `precision`

`storage-size-units auto|MB|GB|TB`

Optional. Alias for `units`.

`temperature-scale celsius|c|fahrenheit|f`

Optional. Sets the scale for display of temperature values:

- `fahrenheit or f`: Temperatures are shown in degrees Fahrenheit.
- `celsius or c`: Temperatures are shown in degrees Celsius. This is the default.

`timeout #`

Optional. Sets the timeout value in seconds for the login session. Valid values are 120 to 43200 seconds (2–720 minutes). The default is 1800 seconds (30 minutes).

`trap-host` *`address`*

Optional. For an SNMPv3 user whose `interface` parameter is set to `snmptarget`, this specifies the network address of the host that receives SNMP traps. The value can be an IPv4 address, IPv6 address, or FQDN.

`type novice|standard|advanced|diagnostic`

Optional. Identifies the user experience level. This parameter is informational only and does not affect access to commands. The default is `standard`.

`units auto|MB|GB|TB`

Optional. Sets the unit for display of storage-space sizes.

- `auto`: Sizes are shown in units that are determined by the system. This is the default.
- `MB`: Sizes are shown in MB.
- `GB`: Sizes are shown in GB.
- `TB`: Sizes are shown in TB.

Based on the `precision` setting, if a size is too small to meaningfully display in the selected unit, the system uses a smaller unit for that size. For example, if `units` is set to `TB`, `precision` is set to 1, and `base` is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.

`name`

A name for the new user, which cannot already exist in the system. Input rules:

- The value is case-sensitive.
- The value can have 29 bytes.
- The value can include printable UTF-8 characters except a space or: " , < \

Examples	Create user `John` who views system information using base 2 in the PowerVault Manager.
	`# create user base 2 interfaces wbi roles monitor John`
	`Enter new password: ********`
	`Re-enter new password: ********`
	Create user `MIB` that can view the SNMP MIB, using authentication and encryption.
	`# create user interfaces snmpuser password Abcd1234 authentication-type SHA privacy-type AES privacy-password Abcd%5678 MIB`
	Create user `Traps` that can receive SNMP trap notifications, using authentication without encryption.
	`# create user interfaces snmptarget authentication-type SHA trap-host 172.22.4.171 Traps`
	`Enter new password: ********`
	`Re-enter new password: ********`

See also	delete user set snmp-parameters set user show users

create vdisk

Description	Creates a linear disk group using the specified RAID level, disks, and spares. This command applies to linear storage only. All disks in the disk group must be the same type (enterprise SAS, for example). **NOTE:** A disk group can contain a mix of 512-byte native sector size (512n) disks and 512-byte emulated sector size (512e) disks. For consistent and predictable performance, do not mix disks of different rotational speed or sector size types (512n, 512e). For each RAID level, the minimum and maximum numbers of disks supported are: • NRAID: 1 • RAID 0: 2–16 • RAID 1: 2 • RAID 3: 3–16 • RAID 5: 3–16 • RAID 6: 4–16 • RAID 10: 4–16 • RAID 50: 6–32 For best practices for creating disk groups, see the Administrator's Guide. When you create a linear disk group, the system creates a linear pool with the same name. A linear pool can contain a single linear disk group.
Minimum role	manage

Syntax	`create vdisk`
	`[assigned-to a|b|auto]`
	`[chunk-size 64k|128k|256k|512k]`
	`disks` *`disks`*
	`level nraid|raid0|r0|raid1|r1|raid3|r3|raid5|r5|raid6|r6|raid10|r10`
	`|raid50|r50`
	`[mode online|offline] [spare` *`disks`*`]`
	`name`

Parameters	`assigned-to a|b|auto`

	Optional. For a system operating in Active-Active ULP mode, this specifies the controller to own the disk group. To let the system automatically load-balance vdisks between controllers, use `auto` or omit this parameter. In Single Controller mode, this parameter is ignored; the system automatically load-balances vdisks in anticipation of the insertion of a second controller in the future
	`chunk-size 64k|128k|256k|512k`
	Optional. The amount of contiguous data, in KB, that is written to a disk group member before moving to the next member of the disk group. For RAID 50, this option sets the chunk size of each RAID-5 subgroup. The chunk size of the RAID-50 disk group is calculated as: *configured-chunk-size*x (*subgroup-members*- 1). For NRAID and RAID 1, `chunk-size` has no meaning and is therefore not applicable. The default size is 512k.
	`disks` *disks*
	The IDs of the disks to include in the disk group. RAID 10 requires a minimum of two RAID-1 subgroups each having two disks. RAID 50 requires a minimum of two RAID-5 subgroups each having three disks. For disk syntax, see Command syntax.
	`level nraid|raid0|r0|raid1|r1|raid3|r3|raid5|r5|raid6|r6|raid10|r10 | raid50|r50`Specifies the RAID level.
	`mode online|offline`
	Optional. Specifies whether the disk group is initialized online or offline.
	● `online`: Enables you to use the disk group immediately after creating it while it is initializing. Because online uses the verify method to create the disk group, it takes longer to complete initializing than offline. Online initialization is fault-tolerant. This option is the default.
	● `offline`: You must wait for the disk group initialization process to finish before using the disk group. However, offline takes less time to complete initializing than online
	`spare disks`
	Optional. The IDs of 1–4 dedicated spares to assign to a RAID 1, 3, 5, 6, 10, or 50 disk group. For disk syntax, see Command syntax.
	name
	A name for the new disk group. Input rules:
	● The value is case sensitive.
	● The value can have a maximum of 32 bytes.
	● The value can include spaces and printable UTF-8 characters except: " , . < \
	● A value that includes a space must be enclosed in double quotes.

Examples	Create a RAID-1 linear disk group named VD1 using two disks.
	`# create vdisk level raid1 disks 0.1,0.3 VD1`
	Create a RAID-50 linear disk group named VD2 having three RAID-5 subgroups, each having three disks.
	`# create vdisk level r50 disks 0.1-3:0.4-6:0.7-9 VD2`
	Create a RAID-6 linear disk group named vdR6 using four disks.
	`# create vdisk level r6 disks 2.3-4,2.8-9 vdR6`

See also	delete vdisks set vdisk show disks show vdisks

create volume

Description	Creates a volume in a linear disk group or virtual pool.

	You must specify a size for the volume. You can create the volume unmapped or set its default mapping. Default mapping settings apply to all hosts. However, a default mapping must be removed to apply an explicit mapping between a host and the volume. You can change the mapping by using the map volume and unmap volume commands. By default, the `create volume` command will not map the created volume. **CAUTION: Using a default mapping for a volume will allow multiple hosts to access the volume. To avoid multiple hosts mounting the volume and causing corruption, the hosts must be cooperatively managed, such as by using cluster software.** Volume sizes are aligned to 4.2 MB (4 MiB) boundaries. When a volume is created or expanded, if the resulting size would be less than 4.2 MB it will be increased to 4.2 MB; if the resulting size would be greater than 4.2 MB it will be decreased to the nearest 4.2 MB boundary. To create multiple volumes at once, use the create volume-set command. **NOTE:** For virtual storage, you cannot add a volume to a volume group that is in a replication set. For virtual storage, you can set the retention priority for snapshots of the volume. If automatic deletion of snapshots is enabled, the system uses the retention priority of snapshots to determine which, if any, snapshots to delete. Snapshots are considered to be eligible for deletion if they have any retention priority other than never-delete. Eligible snapshots are considered for deletion by priority and age. The oldest, lowest priority snapshots are deleted first. Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion.
Minimum role	manage

Syntax	`create volume`
	`[access read-write|rw|read-only|ro|no-access]`
	`[large-virtual-extents enabled|disabled|on|off]`
	`[lun` *`LUN`*`]`
	`[pool` *`pool`*`]`
	`[ports` *`ports`*`]`
	`[reserve` *`size`*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]]`
	`size` *`size`*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
	`[snapshot-retention-priority never-delete|high|medium|low]`
	`[tier-affinity no-affinity|archive|performance]`
	`vdisk` *`vdisk`*
	`[volume-group` *`volume-group`*`]`
	`name`

Parameters	`access read-write|rw|read-only|ro|no-access` Optional. The access permission to use for the mapping: `read-write (rw)`, `read-only (ro)`, or `no-access`. If `no-access` is specified, the volume is not mapped. The default is read-write Optional. For a virtual volume, this sets whether the system will try to allocate pages in a sequentially optimized way to reduce I/O latency in SSD applications and improve performance. • `disabled` or `off`: Optimized page allocation is disabled. This is the defaul`large-virtual-extents enabled|disabled|on|off`t. • `enabled` or `on`: Optimized page allocation is enabled. `lun` *`LUN`* Optional if the `access` parameter is set to `no-access`. Specifies the LUN to assign to the mapping on all ports. `pool` *`pool`* Optional for linear volumes. Required for virtual volumes. The name or serial number of the pool in which to create the volume. `ports` *`ports`*

Optional. The ports through which the host can access the volume. All specified ports must be the same type (FC, for example). For port syntax, see Command syntax. If this parameter is omitted, all ports are selected.

`reserve` *`size`*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`

Optional. Linear storage only. Specifies the size of the snap pool to create in the disk group. The unit is optional (B represents bytes). If base 2 is in use, whether you specify a base-2 or base-10 unit, the resulting size will be in base 2. If no unit is specified, the default is 512-byte blocks. If this parameter is omitted, the size will be either 20% of the volume size or 5.37 GB, whichever is larger. The recommended minimum size for a snap pool is 50

`size` *`size`*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`

Sets the volume size. The unit is optional (B represents bytes). If base 2 is in use, whether you specify a base-2 or base-10 unit, the resulting size will be in base 2. If no unit is specified, the default is 512-byte blocks.

A value less than 4.2 MB (4 MiB) will be increased to that size. A value greater than 4 MB will be decreased to the nearest 4 MB boundary. The maximum size of a virtual volume is 140 TB (128 TiB). The maximum size of a linear volume is equal to the maximum size limit of the disk group.

If overcommit is enabled, the size can exceed the physical capacity of the storage pool. To see whether overcommit is enabled, use the show pools command.

- When the overcommit feature is disabled, the host does not lose read or write access to the pool volumes when the pool reaches or exceeds the high threshold value.
- When the overcommit feature is enabled, the storage system sends the data protect sense key `Add, Sense: Space allocation failed write protect` to the host when the pool reaches or exceeds the high threshold value. If the host is rebooted after the pool reaches or exceeds the high threshold value, the host loses read and write access to the pool volumes. The only way to regain read and write access to the pool volumes is to add more storage to the pool.

`snapshot-retention-priority never-delete|high|medium|low`

Optional. For virtual storage, this specifies the retention priority for snapshots of the volume.

- `never-delete`: Snapshots will never be deleted.
- `high`: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted.
- `medium`: Snapshots may be deleted after all eligible low-priority snapshots have been deleted. This is the default.
- `low`: Snapshots may be deleted.

`tier-affinity no-affinity|archive|performance`

Optional. For virtual storage, this specifies how to tune the tier-migration algorithm for the volume:

- `no-affinity`: This setting uses the highest available performing tiers first and only uses the Archive tier when space is exhausted in the other tiers. Volume data will swap into higher performing tiers based on frequency of access and tier space availability. This is the default
- `archive`: This setting prioritizes the volume data to the least performing tier available. Volume data can move to higher performing tiers based on frequency of access and available space in the tiers.
- `performance`: This setting prioritizes volume data to the higher performing tiers. If no space is available, lower performing tier space is used. Performance affinity volume data will swap into higher tiers based upon frequency of access or when space is made available.

`vdisk` *`vdisk`*

Optional; required for linear volumes. The name or serial number of the linear disk group in which to create the volume. A name that includes a space must be enclosed in double quotes.

`volume-group` *`volume-group`*

Optional. The name of a volume group to which to add the volume. A name that includes a space must be enclosed in double quotes. If the group does not exist, it will be created.

`name`

A name for the new volume. The name must be unique system-wide. Input rules:

- The value is case sensitive.
- The value can have a maximum of 32 bytes.

	• The value can include spaces and printable UTF-8 characters except: " , . < \ • A value that includes a space must be enclosed in double quotes.

Examples	Create the 20-GB volume `V1` in disk group `VD1`, and map it to ports A1 and B1 using LUN 5.
	`# create volume vdisk VD1 size 20GB ports a1,b1 lun 5 V1`
	Create a 100-GB standard volume named `MyVolume` in pool A, map it to use LUN 5 with read-write access through port 1 in each controller, add it to volume group `MyGroup`, and tune tier-migration for performance.
	`# create volume MyVolume pool A size 100GB access rw lun 5 ports 1 volume-group MyGroup tier-affinity performance`
	Create a 20-GB standard volume named `Secrets` in storage pool A, and map it to use LUN 333 with read-only access through all ports.
	`# create volume Secrets pool A size 20GB lun 333 access read-only`
	Create volume `Vol1` with snapshot retention priority high.
	`# create volume snapshot-retention-priority high Vol1`

See also	create volume-set delete volumes set volume show pools show ports show vdisks show volume-groups show volumes

create volume-group

Description	Creates a volume group that includes specified volumes. You can create a maximum of 256 volume groups. A volume group can contain a maximum of 1024 volumes. All volumes in a volume group must be in the same pool.
Minimum role	manage
Syntax	`create volume-group` `volumes` *`volumes`* *`volume-group`*

Parameters	`volumes volumes`
	A comma-separated list of the names or serial numbers of virtual volumes to add to the specified volume group. A name that includes a space must be enclosed in double quotes.
	`volume-group`
	The name of an existing volume group.
	• The value is case sensitive.
	• The value can have a maximum of 32 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , . < \
	• A value that includes a space must be enclosed in double quotes.

Examples	Create a volume group named `VGroup1` that includes hosts `Vol0001` and `Vol0002`. `# create volume-group volumes Vol0001,Vol0002 VGroup1`
See also	add volume-group-members

	delete volume-groups remove volume-group-members set volume group show volume-groups show volumes

create volume-set

Description	Creates a specified number of volumes in a linear disk group or virtual pool. You must specify a base name and a size for the volumes. You can create the volumes unmapped or set their default mapping. Default mapping settings apply to all hosts. However, a default mapping must be removed to apply an explicit mapping between a host and volume. You can change mappings by using the map volume and unmap volume commands. By default, the `create volume-set` command will not map the created volumes. **CAUTION: Using a default mapping for a volume will allow multiple hosts to access the volume. To avoid multiple hosts mounting the volume and causing corruption, the hosts must be cooperatively managed, such as by using cluster software.** Volume sizes are aligned to 4.2 MB (4 MiB) boundaries. When a volume is created or expanded, if the resulting size would be less than 4.2 MB it will be increased to 4.2 MB; if the resulting size would be greater than 4.2 MB it will be decreased to the nearest 4.2 MB boundary. For virtual storage, you can set the retention priority for snapshots of the volume. If automatic deletion of snapshots is enabled, the system uses the retention priority of snapshots to determine which, if any, snapshots to delete. Snapshots are considered to be eligible for deletion if they have any retention priority other than never-delete. Eligible snapshots are considered for deletion by priority and age. The oldest, lowest priority snapshots are deleted first. Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion.
Minimum role	manage

Syntax	`create volume-set`
	`[access read-write|rw|read-only|ro|no-access]`
	`[baselun` *`base-LUN`*`]`
	`basename` *`base-name`*
	`count #`
	`[large-virtual-extents enabled|disabled|on|off]`
	`[pool` *`pool`*`]`
	`[ports` *`ports`*`]`
	`size` *`size`*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
	`[snapshot-retention-priority never-delete|high|medium|low]`
	`[tier-affinity no-affinity|archive|performance]`
	`[vdisk vdisk]`
	`[volume-group` *`volume-group`*`]`

Parameters	`access read-write|rw|read-only|ro|no-access`
	Optional. The access permission to use for the mapping:`read-write (rw)`, `read-only (ro)`, or `no-access`. If no-access is specified, the volume is not mapped. The default is read-write.
	`baselun base-LUN`
	Optional. The first in a sequence of LUNs to assign to map the volumes through ports specified by the `ports` parameter. If the `baselun` and `ports` parameters are omitted, the volumes are not

mapped. If a LUN to be assigned to a volume is already in use, an error message is displayed and that volume and any subsequent volumes are not mapped.

`basename` *base-name*

A name to which a number will be appended to generate a different name for each volume. Volume names must be unique system-wide. Input rules:

- The value is case sensitive.
- The value can have a maximum of 16 bytes.
- The value can include spaces and printable UTF-8 characters except: " , . < \
- A value that includes a space must be enclosed in double quotes.

Resulting volumes are numbered sequentially starting with 0000. If volumes with the specified basename already exist, names of new volumes start with the first available name in the sequence. For example: for basename *vd1_v*, if `vd1_v0000` and `vd1_v0002` exist, the next volumes created will be `vd1_v0001` and `vd1_v0003`.

`count #`

The number of volumes to create, from 1 to 128. Volumes will be created up to the maximum number supported per disk group.

`large-virtual-extents enabled|disabled|on|off`

Optional. For a virtual volume, this sets whether the system will try to allocate pages in a sequentially optimized way to reduce I/O latency and improve performance.

- `disabled` or `off`: Optimized page allocation is disabled. This is the default.
- `enabled` or `on`: Optimized page allocation is enabled

`pool` *pool*

Optional; required for virtual volumes. The name or serial number of the pool in which to create the volumes.

`ports` *ports*

Optional. The controller ports to use for the mapping. All ports must be the same type (FC, for example). For port syntax, see Command syntax. If not all ports are specified, the unspecified ports are not mapped. If the `ports` and `baselun` parameters are omitted, the volumes are not mapped.

`size` *size*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`

Sets the volume size. The unit is optional (B represents bytes). If base 2 is in use, whether you specify a base-2 or base-10 unit, the resulting size will be in base 2. If no unit is specified, the default is 512-byte blocks.

A value less than 4.2 MB (4 MiB) will be increased to 4.2 MB. A value greater than 4.2 MB will be decreased to the nearest 4.2 MB boundary. The maximum size of a virtual volume is 140 TB (128 TiB). The maximum size of a linear volume is equal to the maximum size limit of the disk group.

If overcommit is enabled, the volume size can exceed the physical capacity of the storage pool. To see whether overcommit is enabled, use the show pools command. If overcommit is disabled and the combined size of the volumes will exceed the capacity of the storage pool, an error message is displayed and no volumes are created.

- When the overcommit feature is disabled, the host does not lose read or write access to the pool volumes when the pool reaches or exceeds the high threshold value.
- When the overcommit feature is enabled, the storage system sends the data protect sense key `Add, Sense: Space allocation failed write protect` to the host when the pool reaches or exceeds the high threshold value. If the host is rebooted after the pool reaches or exceeds the high threshold value, the host loses read and write access to the pool volumes. The only way to regain read and write access to the pool volumes is to add more storage to the pool.

`snapshot-retention-priority never-delete|high|medium|low`

Optional. For virtual storage, this specifies the retention priority for snapshots of the volume set.

- `never-delete`: Snapshots will never be deleted.
- `high`: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted
- `medium`: Snapshots may be deleted after all eligible low-priority snapshots have been deleted. This is the default.

	• `low`: Snapshots may be deleted. `tier-affinity no-affinity|archive|performance` Optional. For virtual storage, this specifies how to tune the tier-migration algorithm for the volume: • `no-affinity`: This setting uses the highest available performing tiers first and only uses the Archive tier when space is exhausted in the other tiers. Volume data will swap into higher performing tiers based on frequency of access and tier space availability. This is the default. • `archive`: This setting prioritizes the volume data to the least performing tier available. Volume data can move to higher performing tiers based on frequency of access and available space in the tiers. • `performance`: This setting prioritizes volume data to the higher performing tiers. If no space is available, lower performing tier space is used. Performance affinity volume data will swap into higher tiers based upon frequency of access or when space is made available `vdisk` *`vdisk`* Optional; required for linear volumes. The name or serial number of the linear disk group in which to create the volumes. A name that includes a space must be enclosed in double quotes. `volume-group` *`volume-group`* Optional. The name of a volume group to which to add the volume. A name that includes a space must be enclosed in double quotes. If the group does not exist, it will be created

Examples	Create two unmapped, 100 GB volumes with base name `MyVol-` in pool B and add them to volume group `MyVG`.
	`# create volume-set count 2 size 100GB pool b basename MyVol- volume-group MyVG`
	Create two unmapped, 100 GB volumes with base name `data- in` disk group data.
	`# create volume-set count 2 size 100GB vdisk data basename data-`
	Create ten 20-GB volumes with the base name `vd1_v` in disk group vd1, mapped starting with LUN 5 with read-only access through port A1.
	`# create volume-set count 10 size 20GB vdisk vd1 basename vd1_v baselun 5 access ro ports a1`
	Create four 5 MB volumes with the base name `BV1_` with snapshot retention priority `high`.
	`# create volume-set pool B count 4 size 5MB basename BV1_ snapshot-retention-priority high volume-group Vol1`

See also	create volume delete volumes map volume set volume show maps show pools show vdisks show volume-groups show volumes unmap volume

delete all-snapshots

Description	Deletes all snapshots associated with a specified source volume. This command applies to virtual storage only.

	The source volume can be a base volume or a snapshot. All data associated with the snapshots is deleted and their space in the snap pool is freed for use. The snapshot schedules and tasks are also deleted. **CAUTION: When the snapshots are deleted, all data in those snapshots will be lost.** This command has a confirmation prompt in interactive console mode.
Minimum role	manage
Syntax	`delete all-snapshots` `volume volume`
Parameters	`volume volume` The name or serial number of the source volume. A name that includes a space must be enclosed in double quotes.
Examples	Delete all snapshots associated with volume `MV1`. `# delete all-snapshots volume MV1`
See also	show snapshots show volumes

delete chap-records

Description	Deletes a specified CHAP record or all CHAP records. This command is permitted whether or not CHAP is enabled. For a login request from an initiator to a storage system, the initiator is the originator and the storage system is the recipient. Because CHAP works during login, to make CHAP changes take effect you must reset any active iSCSI host links. In a peer connection, a storage system can act as the originator or recipient of a login request. As the originator, with a valid CHAP record it can authenticate CHAP even if CHAP is disabled. This is possible because the system will supply the CHAP secret requested by its peer and the connection will be allowed. **NOTE:** Deleting CHAP records may make volumes inaccessible and the data in those volumes unavailable.
Minimum role	manage

Syntax	To delete the CHAP record for a specific originator:
	`delete chap-records`
	`name originator-name`
	To delete all CHAP records:
	`delete chap-records`
	`all`

Parameters	`name originator-name`
	The originator name, typically in IQN format.
	`all`
	Delete all CHAP records in the database.

Examples	Delete the CHAP record for a specific originator. `# delete chap-records name iqn.1991-05.com.microsoft:myhost.domain`

	Delete all CHAP records. `# delete chap-records all`
See also	create chap-record set chap-record show chap-records show iscsi-parameters

delete host-groups

Description	Deletes specified host groups and optionally all hosts in those groups. Before using the option to delete all the hosts in the groups, ensure that the hosts are unmapped. This command has a confirmation prompt in interactive console mode.
Minimum role	manage

Syntax	`delete host-groups`
	`[delete-hosts]`
	`host-groups` `|all`

Parameters	`delete-hosts` Optional. Specifies to delete all hosts in the groups. If this parameter is omitted, the host groups will be deleted but their hosts will not be deleted. *`host-groups`*`|all` Specifies either: • A comma-separated list of the names of host groups to delete. A name that includes a space must be enclosed in double quotes. • `all`: Deletes all host groups.

Examples	Delete host group `HGroup1` but not the hosts in those groups.
	`# delete host-groups HGroup1`
	Delete all host groups and the hosts in those groups.
	`# delete host-groups delete-hosts all`

See also	show host-groups

delete hosts

Description	Deletes specified hosts that are not in a host group. Mapped and unmapped hosts can be deleted. Deleting a host does not delete its initiators. Volume maps continue to apply to the initiators in the host that is deleted.
Minimum role	manage
Syntax	`delete hosts` *`hosts`*`|all`
Parameters	*`hosts`*`|all` Specifies either: • A comma-separated list of the names of hosts to delete. A name that includes a space must be enclosed in double quotes.

	• `all`: Deletes all hosts.

Examples	Delete hosts `Host1` and `Host2`.
	`# delete hosts Host1,Host2`
	Delete all hosts.
	`# delete hosts all`

See also	create host set host set initiator show host-groups show initiators

delete initiator-nickname

Description	Deletes manually created initiators or the nicknames of discovered initiators. Volume maps continue to apply to the initiators in the host that is deleted. If you delete the nickname of a discovered initiator, commands will show the initiator by its ID.
Minimum role	manage
Syntax	`delete initiator-nickname` *`initiator`*`|all`
Parameters	*`initiator`*`|all` Specifies either: • The nickname or ID of the initiator to delete. A value that includes a space must be enclosed in double quotes. • `all`: Deletes all manually created initiators and nicknames of discovered initiators.

Examples	Delete the manually created initiator named *`Init1`*.
	`# delete initiator-nickname Init1`
	Delete the nickname of discovered initiator *`Init2`*.
	`# delete initiator-nickname Init2`
	Delete all manually created initiators and nicknames of discovered initiators.
	`# delete initiator-nickname all`

See also	create host set initiator show initiators

delete peer-connection

Description	Deletes a peer connection between two storage systems. You can run this command on either the local or remote system. You cannot delete a peer connection if any replication sets are using it
Minimum role	manage

Syntax	`delete peer-connection`
	`[local-only]`
	`peer-connection-ID`

Parameters	`local-only` Optional. Only use this parameter if you need to remove a peer connection when no network connection is available between the systems and you do not expect to be able to reconnect them. Do not use this parameter in normal operating conditions. Run the command with this parameter on both systems. After the peer connection has been deleted, if you want to re-create it with new addresses, use the create peer-connection command. *`peer-connection-ID`* Specifies the name or serial number of the peer connection to delete.
Examples	Delete the peer connection `Peer1`. `# delete peer-connection Peer1`
See also	create peer-connection query peer-connection set peer-connection show peer-connection

delete pools

Description	Deletes specified pools **CAUTION: Deleting a pool will delete all the data it contains.** For linear storage, a pool and a disk group are logically equivalent. For a linear pool, if the pool contains volumes, the command will prompt for confirmation to delete the volumes. If the reply is `yes`, the command will unmap and delete all volumes in the pool, delete the pool and corresponding disk group, and make all the disks available. If the reply is `no`, the command will be canceled. For virtual storage, a pool can contain multiple disk groups. For a virtual pool, if the pool contains volumes, the command will prompt for confirmation to delete the volumes. If the reply is `yes`, the command will unmap and delete all volumes in the pool, and then delete each disk group in the pool and make all the disks available. If the reply is `no`, the command will be canceled. **NOTE:** • You cannot remove the only pool from a system that is used in a peer connection, or a pool that contains a volume that is used in a replication set. • If you delete a quarantined disk group and its missing disks are later found, the group will reappear as quarantined or offline and you must delete it again (to clear those disks).
Minimum role	manage

Syntax	`delete pools`
	`[prompt yes|no]`
	`pools`

Parameters	`[prompt yes|no]` Optional. For scripting, this specifies an automatic reply to confirmation prompts: • yes: Allow the command to proceed. • no: Cancel the command. If this parameter is omitted, you must manually reply to prompts. *`pools`*

	A comma-separated list of the names or serial numbers of the pools to delete. For a linear pool, a name that includes a space must be enclosed in double quotes.

Examples	Delete virtual pool *A*.
	`# delete pools A`
	Delete linear pool *dg1*.
	`# delete pools dg1`

See also	delete vdisks remove disk-groups show pools show vdisks

delete remote-system

Description	Deletes the persistent association with a remote system. This command applies to linear storage only. **NOTE:** Remote-system connections for linear replication are not supported for virtual replication. Instead you must create peer connections.
Minimum role	manage
Syntax	`delete remote-system` *system*
Parameters	`system` The name or network-port IP address of the remote system. A name that includes a space must be enclosed in double quotes. The value can be an IPv4 address, IPv6 address, or FQDN.
Examples	Delete remote system `System2`. `# delete remote-system System2`
See also	show remote-systems

delete replication-set

Description	Deletes a replication set. This command applies to virtual storage only. You can run this command on the replication set's primary or secondary system. When you delete a virtual replication set, the internal snapshots created by the system are also deleted. However, no user data is deleted. The primary and secondary volumes can be used like any other base volumes. You cannot delete a virtual replication set if it has a replication in progress. If you want to delete a replication set that has a replication in progress, you must first suspend and then abort replication for that replication set. To view replication activity, use the show replication-sets command. To suspend replication, use the suspend replication-set command. To abort replication, use the abort replication command. This command has a confirmation prompt in interactive console mode.
Minimum role	manage
Syntax	`delete replication-set` `[local-only]`

	replication-set-ID

Parameters	`local-only`
	Optional. Use this parameter only if you need to remove a replication set from a primary or secondary system when no network connection is available to the peer system and you do not expect to be able to reconnect them. Do not use this parameter in normal operating conditions.
	Run the command with this parameter on both the primary system and the secondary system to completely remove the replication relationship between the primary and secondary volumes.
	`replication-set-ID`
	The name or serial number of the replication set. A name that includes a space must be enclosed in double quotes.

Examples	Delete replication set `RS1`. `# delete replication-set RS1`
See also	abort replication create replication-set resume replication-set set replication-set show replication-sets suspend replication-set

delete schedule

Description	Deletes a task schedule. If you no longer want a scheduled task to occur, you can delete the schedule. When a volume or snapshot is deleted, its schedules and tasks are also deleted. If the schedule uses a task that is not used by any other schedule, a confirmation prompt will ask whether you want to delete the schedule and the task. Reply yes to delete both, or no to delete only the schedule.
Minimum role	manage

Syntax	`delete schedule`
	`[prompt yes|no]`
	schedule

Parameters	`prompt yes|no` Optional. For scripting, this specifies an automatic reply to confirmation prompts: • `yes`: Allow the command to proceed. • `no`: Cancel the command. If this parameter is omitted, you must manually reply to prompts. *schedule* The name of the schedule to delete.
Examples	Delete schedule *Sched1*. `# delete schedule Sched1`
See also	create schedule set schedule show schedules

delete snapshot

Description	Deletes specified snapshots. This command applies to virtual storage only. All data uniquely associated with the snapshot is deleted and associated space in the pool is freed for use. The snapshot's schedules are also deleted. **CAUTION: When a snapshot is deleted, all data in the snapshot will be lost.** This command has a confirmation prompt in interactive console mode.
Minimum role	manage
Syntax	`delete snapshot` *`snapshots`*
Parameters	*`snapshots`* A comma-separated list of the names or serial numbers of the snapshots to delete. A name that includes a space must be enclosed in double quotes
Examples	Delete standard snapshots `s1`, `s2`, and `s3`. `# delete snapshot s1,s2,s3`
See also	delete all-snapshots show snapshots

delete task

Description	Deletes a task. If the task is scheduled, a confirmation prompt will ask whether you want to delete the task and its schedules. Reply `yes` to delete both, or `no` to cancel the command.
Minimum role	manage
Syntax	`delete task` *`[prompt yes|no]`* *`task`*

Parameters	`prompt yes|no`
	Optional. For scripting, this specifies an automatic reply to confirmation prompts:
	• `yes`: Allow the command to proceed.
	• `no`: Cancel the command.
	If this parameter is omitted, you must manually reply to prompts.
	`task`
	The name of the task to delete.

Examples	Delete task `Task1`. `# delete task Task1`
See also	create task delete schedule show schedules show tasks

delete user

Description	Deletes a user account. You can delete any user, except for the user you are logged in as. However, the system requires at least one CLI user with the `manage` role to exist. When a user is deleted, any sessions associated with that user name are terminated. This command has a confirmation prompt in interactive console mode.
Minimum role	manage
Syntax	`delete user` *`[noprompt]`* *`name`*
Parameters	`noprompt` Optional. Suppresses confirmation prompts. Specifying this parameter enables the command to proceed without user interaction. *`name`* The user to delete. Names are case-sensitive.
Examples	Delete user `jsmith`. `# delete user jsmith`
See also	create user show users

delete vdisks

Description	Deletes specified linear disk groups. This command applies to linear storage only. This unmaps and deletes all volumes in the disk groups and makes all the disks available. **CAUTION: Deleting a linear disk group will delete all data it contains.** **NOTE:** If you delete a quarantined disk group and its missing disks are later found, the disk group will reappear as quarantined or offline and you must delete it again (to clear those disks).
Minimum role	manage

Syntax	`delete vdisks`
	`[prompt yes|no]`
	`vdisks`

Parameters	`prompt yes|no` Optional. For scripting, this specifies an automatic reply to confirmation prompts: • `yes`: Allow the command to proceed. • `no`: Cancel the command. *`vdisks`* If this parameter is omitted, you must manually reply to prompts. A comma-separated list of the names or serial numbers of the linear disk groups to delete. A name that includes a space must be enclosed in double quotes.
Examples	Delete linear disk groups `VD1` and `VD2`. `# delete vdisks VD1,VD2`

See also	create vdisk show vdisks

delete volume-groups

Description	Deletes specified volume groups and optionally all volumes in those groups. Before using the option to delete all the volumes in the groups, ensure that the volumes are unmapped. If any volume is mapped, the command will fail and no changes will be made. **NOTE:** For virtual storage, before you can delete a volume group that is in a replication set you must delete the replication set. This command has a confirmation prompt in interactive console mode
Minimum role	manage

Syntax	`delete volume-groups`
	`[delete-volumes]`
	`volume-groups|all`

Parameters	`delete-volumes` Optional. Specifies to delete all volumes in the groups. If this parameter is omitted, the volume groups will be deleted but their volumes will not be deleted. *`volume-groups`*`|all` Specifies either: • A comma-separated list of the names of volume groups to delete. A name that includes a space must be enclosed in double quotes. • `all`: Deletes all volume groups.

Examples	Delete volume groups `VGroup1` and `VGroup2` but not the volumes in those groups.
	`# delete volume-groups VGroup1,VGroup2`
	Delete all volume groups and the volumes in those groups.
	`# delete volume-groups delete-volumes all`

See also	show maps show volume-groups

delete volumes

Description	Deletes specified volumes. **CAUTION: Deleting a volume will delete all data it contains, and its schedules.** **NOTE:** For virtual storage, you cannot delete a volume that is in a replication set. This command has a confirmation prompt in interactive console mode.
Minimum role	manage
Syntax	`delete volumes` *`volumes`*
Parameters	*`volumes`* A comma-separated list of the names or serial numbers of the volumes to delete. A name that includes a space must be enclosed in double quotes

Examples	Delete volumes `vol1` and `vol2`. `# delete volumes vol1,vol2`
See also	create volume show volumes

dequarantine

Description	Removes a disk group from quarantine. **NOTE:** For virtual storage, this command should only be used by or with direction from technical support. Dequarantine is supported for a RAID-3, RAID-5, RAID-6, or RAID-50 disk group and operates as detailed below. Dequarantine is not supported for a RAID-1 or RAID-10 disk group. For these RAID levels, if the missing disks become available, the disk group will be dequarantined automatically. Otherwise, some data will have been lost because data in the remaining disks will be invalid ("stale"). **CAUTION: Carefully read this topic to determine whether to use the dequarantine command to manually remove a disk group from quarantine. The dequarantine command should only be used as part of the emergency procedure to attempt to recover data. If a disk group is manually dequarantined and does not have enough disks to continue operation, its status will change to OFFL and its data may or may not be recoverable. It is recommended that you contact technical support for assistance in determining if the recovery procedure that makes use of the dequarantine acommand applies to your situation and for assistance to perform it.** To continue operation and not go to quarantined status, a RAID-3 or RAID-5 disk group can have only one inaccessible disk, a RAID-6 disk group can have only one or two inaccessible disks, and a RAID-10 or RAID-50 disk group can have only one inaccessible disk per subgroup. For example, a 16-disk RAID-10 disk group can remain online (critical) with 8 inaccessible disks if one disk per mirror is inaccessible. The system will automatically quarantine a disk group having a fault-tolerant RAID level if one or more of its disks becomes inaccessible, or to prevent invalid data that may exist in the controller from being written to the disk group. Quarantine will not occur if a known-failed disk becomes inaccessible or if a disk becomes inaccessible after failover or recovery. The system will automatically quarantine an NRAID or RAID-0 disk group to prevent invalid data from being written to the disk group. If quarantine occurs because of an inaccessible disk, event 172 is logged. If quarantine occurs to prevent writing invalid data, event 485 is logged. Examples of when quarantine can occur are: • At system power-up, a disk group has fewer disks online than at the previous power-up. This may happen because a disk is slow to spin up or because an enclosure is not powered up. The disk group will be automatically dequarantined if the inaccessible disks come online and the disk group status becomes `FTOL` (fault tolerant and online), or if after 60 seconds the disk group status is `QTCR` or `QTDN`. • During system operation, a disk group loses redundancy plus one more disk. For example, three disks are inaccessible in a RAID-6 disk group or two disks are inaccessible for other fault-tolerant RAID levels. The disk group will be automatically dequarantined if after 60 seconds the disk group status is `FTOL`, `FTDN`, or `CRIT`. Quarantine isolates the disk group from host access and prevents the system from changing the disk group status to `OFFL` (offline). The number of inaccessible disks determines the quarantine status. From least to most severe: • `QTDN` (quarantined with a down disk): The RAID-6 disk group has one inaccessible disk. The disk group is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is `QTCR` or `QTDN`, the disk group is automatically dequarantined.

	• QTCR (quarantined critical): The disk group is critical with at least one inaccessible disk. For example, two disks are inaccessible in a RAID-6 disk group or one disk is inaccessible for other fault-tolerant RAID levels. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined. • QTOF (quarantined offline): The disk group is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 disk group. When a disk group is quarantined, its disks become write-locked, its volumes become inaccessible, and it is not available to hosts until it is dequarantined. If there are interdependencies between the quarantined disk group's volumes and volumes in other disk groups, quarantine may temporarily impact operation of those other volumes. Depending on the operation, the length of the outage, and the settings associated with the operation, the operation may automatically resume when the disk group is dequarantined or may require manual intervention. A disk group can remain quarantined indefinitely without risk of data loss. A disk group is dequarantined when it is brought back online, which can occur in three ways: • If the inaccessible disks come online, making the disk group FTOL, the disk group is automatically dequarantined. • If after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined. The inaccessible disks are marked as failed and the disk group status changes to CRIT (critical) or FTDN (fault tolerant with a down disk). If the inaccessible disks later come online, they are marked as LEFTOVR (leftover). • The dequarantine command is used to manually dequarantine the disk group. If the inaccessible disks later come online, they are marked as LEFTOVR (leftover). If event 172 was logged, do not use the dequarantine command. Instead follow the event's recommended-action text. If event 485 was logged, use the dequarantine command only as specified by the event's recommended-action text to avoid data corruption or loss. When a disk group is dequarantined, event 173 is logged. A quarantined disk group can be fully recovered if the inaccessible disks are restored. Make sure that all disks are properly seated, that no disks have been inadvertently removed, and that no cables have been unplugged. Sometimes not all disks in the disk group power up. Check that all enclosures have restarted after a power failure. If these problems are found and then fixed, the disk group recovers and no data is lost. If the inaccessible disks cannot be restored (for example, they failed), and the disk group's status is FTDN or CRIT, and compatible spares are available to replace the inaccessible disks, reconstruction will automatically begin. If a replacement disk (reconstruct target) is inaccessible at power up, the disk group becomes quarantined. When the disk is found, the disk group is dequarantined and reconstruction starts. If reconstruction was in process, it continues where it left off. **NOTE:** The only commands allowed for a quarantined disk group are dequarantine and delete vdisks and remove disk-groups. If you delete a quarantined disk group and its inaccessible disks later come online, the disk group will reappear as quarantined or offline and you must delete it again (to clear those disks). This command has a confirmation prompt in interactive console mode.
Minimum role	manage
Syntax	dequarantine disk-group *disk-group* vdisk *vdisk*
Parameters	disk-group *disk-group*The name or serial number of the disk group to remove from quarantine. A name that includes a space must be enclosed in double quotes.vdisk *vdisk* The name or serial number of the linear disk group to remove from quarantine. A name that includes a space must be enclosed in double quotes.
Examples	After determining that linear disk group VD1 is quarantined, remove it from quarantine and re-check its status.

	`# show vdisks`
	`Name ... Status ...`
	`------------------`
	`VD1 ... QTDN ... (RAID 6 quarantined with a down disk)`
	`------------------`
	`# dequarantine vdisk VD1`
	`Info: Disk group VD1 was dequarantined. (VD1)`
	`...`
	`# show vdisks`
	`Name ... Status ...`
	`------------------`
	`VD1 ... FTDN ... (RAID 6 fault tolerant with a down disk)`
	`------------------`
	Dequarantine disk group `dgB01`.
	`# dequarantine disk-group dgB01`

See also	show disk-groups show vdisks

exit

Description	Log off and exit the CLI session.
Minimum role	monitor
Syntax	`exit`

expand disk-group

Description	Adds disks to a disk group to expand its storage capacity. This command applies to linear disk groups using any RAID level except NRAID and RAID 1. This command applies to virtual disk groups using ADAPT. The new disks must be the same type as disks already in the disk group. The disks need not have consistent capacity; ADAPT will use whatever space is available. The new disks must also be in the same tier as the disk group. **NOTE:** If you upgraded from an earlier release that did not distinguish between enterprise and midline SAS disks, you might have disk groups that contain both types of disks. For those groups, you can designate either or both types of disks for expansion. If—through replacement of spares or failed disks—the disk group is changed to contain only one type of disk, you will only be able to add disks of that type to the disk group. **NOTE:** A disk group can contain a mix of 512-byte native sector size (512n) disks and 512-byte emulated sector size (512e) disks. For consistent and predictable performance, do not mix disks of different sector size types (512n, 512e). The expansion capability for each supported RAID level is:

RAID level	Expansion capability	Maximum disks
NRAID	Cannot expand.	1
0	Can add 1–4 disks at a time (linear storage).	16
0	Cannot expand (read cache, virtual storage).	2
0	Cannot expand (linear storage).	2
3	Can add 1–4 disks at a time (linear storage).	16
5	Can add 1–4 disks at a time.	16
6	Can add 1–4 disks at a time.	16
10	Can add 2 or 4 disks at a time (linear storage).	16
50	Can expand the disk group one RAID-5 subgroup at a time. The added RAID-5 subgroup must contain the same number of disks as each original subgroup	32
ADAPT	Can add up to 68 disks at a time	128

When disks are added to an ADAPT disk group, the system will first replenish any spare capacity needed to be fully fault-tolerant, then use the remainder or expansion of user data capacity.

- When set to the default spare capacity, the system will try to replenish spare capacity to be the sum of the two largest disks in the group.
- When default spare capacity has been overridden (via the set disk-group `adapt-target-spare-capacity` parameter), the system will try to replenish spare capacity to meet the configured target GiB.
- If the actual spare capacity meets the target spare capacity, the new disk capacity will be allocated to user data.

NOTE: Expansion of a non-ADAPT disk group can take hours or days to complete, depending on the disk group's RAID level and size, disk speed, utility priority, and other processes running on the storage system. You can stop expansion only by deleting the disk group. Expansion of an ADAPT disk group is very fast and extra capacity is immediately available when rebalancing is not needed. If rebalancing is needed, extra capacity may not be available until rebalancing is complete.

Before starting the expansion, ensure no other utilities are running on the disk group. If another operation is in progress, the expansion cannot start.

Minimum role

manage

Syntax

```
expand disk-group
disks disks
[prompt yes|no]
disk-group
```

Parameters

`disks` *disks*

The IDs of the disks to add. For disk syntax, see Command syntax.

`prompt yes|no`

Optional. For scripting, this specifies an automatic reply to confirmation prompts:

- `yes`: Allow the command to proceed.
- `no`: Cancel the command

If this parameter is omitted, you must manually reply to prompts.

`disk-group`

The name or serial number of the disk group to expand. A name that includes a space must be enclosed in double quotes.

Examples

Expand disk group `DG1` to include disk `1.11`.

	`# expand disk-group disks 1.11 DG1`
	Expand a RAID-10 disk group named `R10` to include an additional mirror pair.
	`# expand disk-group disks 2.9-10 R10`
	Expand a RAID-50 linear disk group named `R50`, which has four 3-disk subgroups, to include an additional subgroup.
	`# expand disk-group disks 2.1-2,2.5 R50`
	Add 10 disks to ADAPT disk group `Data3`.
	`# expand disk-group disks 1.1-10 Data3`

See also	show disk-groups show disks show vdisks

expand vdisk

Description

Adds disks to a linear disk group to expand its storage capacity.

The new disks must be the same type as disks already in the disk group. The disks need not have consistent capacity; ADAPT will use whatever space is available.

NOTE: If you upgraded from an earlier release that did not distinguish between enterprise and midline SAS disks, you might have disk groups that contain both types of disks. For those groups, you can designate either or both types of disks for expansion. If—through replacement of spares or failed disks—the disk group is changed to contain only one type of disk, you will only be able to add disks of that type to the disk group.

NOTE: A disk group can contain a mix of 512-byte native sector size (512n) disks and 512-byte emulated sector size (512e) disks. For consistent and predictable performance, do not mix disks of different sector size types (512n, 512e).

The expansion capability for each supported RAID level is:

RAID level	Expansion capability	Maximum disks
NRAID	Cannot expand.	1
0, 3, 5, 6	Can add 1–4 disks at a time.	16
1	Cannot expand.	2
10	Can add 2 or 4 disks at a time (linear storage).	16
50	Can expand the disk group one RAID-5 subgroup at a time. The added RAID-5 subgroup must contain the same number of disks as each original subgroup	32
ADAPT	Can add up to 68 disks at a time	128

When disks are added to an ADAPT disk group, the system will first replenish any spare capacity needed to be fully fault-tolerant, then use the remainder or expansion of user data capacity.

- When set to the default spare capacity, the system will try to replenish spare capacity to be the sum of the two largest disks in the group.
- When default spare capacity has been overridden (via the set vdisk `adapt-target-spare-capacity` parameter), the system will try to replenish spare capacity to meet the configured target GiB.
- If the actual spare capacity meets the target spare capacity, the new disk capacity will be allocated to user data.

	NOTE: Disk group expansion cannot be stopped and can take days to complete, depending on disk type, RAID level, and other factors. Before starting the expansion, ensure no other utilities are running on the disk group. If another operation is in progress, the expansion cannot start.
Minimum role	manage

Syntax	`expand vdisk`
	`disks` *disks*
	`[prompt yes|no]`
	vdisk

Parameters	disks *disks*
	The IDs of the disks to add. For disk syntax, see Command syntax.
	`prompt yes|no`
	Optional. For scripting, this specifies an automatic reply to confirmation prompts:
	• `yes`: Allow the command to proceed.
	• `no`: Cancel the command
	If this parameter is omitted, you must manually reply to prompts.
	`vdisk`
	The name or serial number of the linear disk group to expand. A name that includes a space must be enclosed in double quotes.

Examples	Expand linear disk group `VD1` to include disk `1.11`.
	`# expand vdisk disks 1.11 VD1`
	Expand a RAID-10 linear disk group named `R10` to include an additional mirror pair.
	`# expand vdisk disks 2.9-10 R10`
	Expand a RAID-50 linear disk group named `R50`, which has four 3-disk subgroups, to include an additional subgroup.
	`# expand vdisk disks 2.1-2,2.5 R50`
	Add 10 disks to ADAPT disk group `Data3`.
	`# expand disk-group disks 1.1-10 Data3`

See also	show disk-groups show disks show vdisks

expand volume

Description	Expands a standard or base volume. Volume sizes are aligned to 4.2 MB (4 MiB) boundaries. When a volume is created or expanded, if the resulting size would be less than 4.2 MB it will be increased to 4 MB; if the resulting size would be greater than 4.2 MB it will be decreased to the nearest 4.2 MB boundary. For virtual storage, if overcommit is disabled, expansion is restricted to the space available in the pool that contains the volume. If overcommit is enabled, the volume size can exceed the physical capacity of the pool. To see whether overcommit is enabled, use the show pools command. The maximum size of a virtual volume is 140 TB (128 TiB). • When the overcommit feature is disabled, the host does not lose read or write access to the pool volumes when the pool reaches or exceeds the high threshold value.

	• When the overcommit feature is enabled, the storage system sends the data protect sense key `Add, Sense: Space allocation failed write protect` to the host when the pool reaches or exceeds the high threshold value. If the host is rebooted after the pool reaches or exceeds the high threshold value, the host loses read and write access to the pool volumes. The only way to regain read and write access to the pool volumes is to add more storage to the pool. For linear storage, if insufficient space is available for expansion in the disk group, first expand the disk group by using expand vdisk. The maximum size of a linear volume is equal to the maximum size limit of the disk group. You cannot expand the secondary volume of a replication set. However, you can expand the primary volume of a replication set, which automatically expands its secondary volume—even if replication is in progress.
Minimum role	manage

Syntax	`expand volume`
	`size` *`size`*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB] | max`
	`volume`

Parameters	`size` *`size`*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB] | max` Specifies either: • The amount of space to add to the volume. The unit is optional (B represents bytes). If base 2 is in use, whether you specify a base-2 or base-10 unit, the resulting size will be in base 2. If no unit is specified, the default is 512-byte blocks. • `max`: For linear storage, expand the volume to fill the available space in the disk group. *`volume`* The name or serial number of the volume to expand. A name that includes a space must be enclosed in double quotes.
Examples	Expand volume `V1` by 100 GB. `# expand volume size 100GB V1`
See also	expand disk-group expand vdisk show volumes

help

Description	Shows brief help for all available commands or full help for a specific command. This help topic also provides tips for using command shortcuts.
Minimum role	monitor

Syntax	To view brief descriptions of all commands that are available to the user role you logged in as, enter:
	`help`
	To view help for a command name, enter:
	`help command-name`
	To view information about the syntax for specifying parameters, disks, and so forth, enter:
	`help syntax`
	To view the information shown in this topic and in Command completion, editing, and history, enter:
	`help help`

Examples	Show brief help for all available commands: `# help`

	Show full help for the show cli-parameters command: `# help show cli-parameters`

map volume

Description	Maps specified volumes using settings that override the volumes' default mapping. When a volume is created, if no mapping settings are specified the volume is not mapped. Otherwise, those settings become its default mapping, which specifies the controller host ports and access level that all connected initiators have to the volume, and the LUN presented to all initiators to identify the volume. The default mapping's LUN is known as the volume's *default LUN*. The map volume command creates mappings with different settings for different initiators. Optionally, you can specify the LUN, ports, and access level for a mapping. A mapping can make a volume accessible to initiators, or inaccessible to initiators (known as *masking*). For example, assume a volume's default mapping allows read-only access using LUN 5. You can give one initiator read-write access using LUN 6, and you can give a second initiator no access to the volume. **CAUTION: Using a default mapping for a volume will allow multiple hosts to access the volume. To avoid multiple hosts mounting the volume and causing corruption, the hosts must be cooperatively managed, such as by using cluster software.** **NOTE:** • You cannot map a replication set's secondary volume. Create a snapshot of the secondary volume or enable replication snapshot history and use the snapshot for mapping and accessing data. • When mapping a volume to an initiator using the Linux ext3 file system, specify read-write access. Otherwise, the file system will be unable to mount/present/map the volume and will report an error such as "unknown partition table."
Minimum role	manage

Syntax	`map volume`
	`volumes|volume-groups`
	`[access read-write|rw|read-only|ro|no-access]`
	`[host` *`hosts`*`]`
	`initiator` *`initiators|hosts|host-groups`*
	`[lun` *`LUN`*`]`
	`[ports` *`ports`*`]`

Parameters	*`volumes|volume-groups`* A comma-separated list of the names or serial numbers of the volumes or volume groups to map. For volume and volume-group syntax, see Command syntax `access read-write|rw|read-only|ro|no-access` Optional. The access permission to use for the mapping: read-write (`rw`), read-only (`ro`), or `no-access`. If the access parameter is specified as read-write or read-only, the `lun` parameter must be specified. For an explicit mapping, `no-access` causes the volume to be masked from specified initiators. If the `access` parameter is omitted, access is set to `read-write`. `host` *`hosts`* Deprecated—use the `initiator` parameter instead. `initiator` *`initiators|hosts|host-groups`* Optional. A comma-separated list of initiators, hosts, or host groups to which to map the volumes. For initiator, host, and host-group syntax, see Command syntax. If the `initiator` parameter is specified, the `lun` and `ports` parameters must be specified. If the initiator parameter is omitted, the mapping applies to all initiators that are not explicitly mapped.

	`lun` *LUN* Optional. The LUN to use for the mapping. If a single volume and multiple initiators are specified, the same LUN is used for each initiator. If multiple volumes and a single initiator are specified, the LUN will increment for the second and subsequent volumes. If multiple volumes and initiators are specified, each initiator will have the same LUN for the first volume, the next LUN for the second volume, and so on. The `lun` parameter is ignored if `access` is set to `no-access`. If the `lun` parameter is omitted, the default LUN is presented. `ports` *ports* Optional. The controller host ports to use for the mapping. Any unspecified ports become unmapped. All specified ports must be the same type (FC, for example). For port syntax, see Command syntax. If the `ports` parameter is specified, the `lun` parameter must also be specified. The `ports` parameter is ignored if `access` is set to `no-access`. If the `ports` parameter is omitted, all ports are mapped.

Examples	Map volume `vol2` with read-only access to initiator *Init1*, using port A1 and LUN 100.
	`# map volume vol2 access ro ports a1 lun 100 initiator Init1`
	Map volumes `vol2` and `vol3` with read-write access for `Init2`, using ports A1 and B1 and LUN 101.
	`# map volume vol2,vol3 access rw ports a1,b1 lun 101 initiator Init2`
	Mask volume `vol4` from `Init1` and `Init3`.
	`# map volume vol4 access no-access initiator Init1,Init3`
	Map volumes `vol1` and `vol2` to initiators `Init1` and `Init2`, using ports A1 and B1 starting with LUN 6, and view the results.
	`# map volume vol1,vol2 ports a1,b1 lun 6 initiator Init1,Init2`
	Map volume group `volGroupA` to host group `hostGroupA`, starting with LUN 1 on ports A0 and B0.
	`# map volume volGroupA.* initiator hostGroupA.*.* lun 1 port A0,B0`

See also	show host-groups show initiators show maps show ports show volume-groups show volumes unmap volume

meta

Description	In API format only, shows all property metadata for objects. This includes data not shown in `brief` mode.
Minimum role	monitor
Syntax	`meta` *basetypes*
Parameters	*basetypes* A basetype or a list of basetypes separated by commas (with no spaces) to specify the objects for which to show metadata. For names and descriptions of supported basetypes, see API basetype properties
Examples	Show all metadata for objects returned by the show disks command: `# meta drives`
See also	set cli-parameters

ping

Description	Tests communication with a remote host. The remote host is specified by IP address. Ping sends ICMP echo response packets and waits for replies.
Minimum role	monitor

Syntax	`ping`
	`host-address`
	`[count` *`count`*`]`

Parameters	*`host-address`* The network address of the remote host. The value can be an IPv4 address, IPv6 address, or FQDN. `count` *`count`* Optional. The number of packets to send. The default is 4 packets. Use a small count because the command cannot be interrupted. The default is 4 packets.
Examples	Send two packets to the remote computer at *10.134.50.6*. `# ping 10.134.50.6 count 2`

query peer-connection

Description	Queries a storage system to potentially use in a peer connection and shows information about the storage system via the in-band query. The system uses this information to determine how to set up the peer connection. You can use this command to view information about systems you might use in a peer connection before creating the peer connection, or to view information about systems currently in a peer connection before modifying the peer connection. For example, to create a peer connection you must specify a port address on the remote system. You can specify any port address that this command shows as having `Reachable Local Links` values.
Minimum role	monitor
Syntax	`query peer-connection` *`remote-port-address`*
Parameters	*`remote-port-address`*Specifies the FC WWN or iSCSI IP address of the system to query. IPv4 and IPv6 formats are supported.

Output	`Controller`
	• `A`: Controller A.
	• `B`: Controller B.
	`Storage Controller Code Version`
	Storage Controller firmware version and loader version.
	`Management Controller Code Version`
	Management Controller firmware version and loader version.
	`IPv4 Address`
	Controller network port IPv4 address.
	`Peer Host Name`
	Controller network port IP address in the peer system.
	`IPv6 Address 1-4`

	Up to four IPv6 addresses configured for use, or Not Configured.
	`Port`
	The port ID.
	`Type`
	• `FC`: FC port.
	• `iSCSI`: iSCSI port.
	• `Unknown`: Port type is unknown
	`Port Health`
	• `Up`
	• `Down`
	• `Degraded`
	• `SFP Issue`
	• `Unknown`
	`Port Address`
	The assigned port address.
	`Reachable Local Links`
	The IDs of ports in the local system linked to ports in the remote system.

Examples	Query the system with an IP address of 192.168.200.22. `# query peer-connection 192.168.200.22`
Basetypes	peer-connection-info status
See also	create peer-connection delete peer-connection set peer-connection show peer-connections

recover replication-set

Description	Provides options to recover a replication set after a disaster. All options work with either a single volume or a volume group. First you run the command to perform a failover operation. After this operation completes, you rerun the command to perform one of the following recovery operations: failback-no-restore, or reverse. **CAUTION: The reverse operation is designed to discard the latest updates to a primary volume. This is not a problem if the operation proceeds without error. However, if errors occur, you could lose data. To mitigate this potential problem, take a snapshot of the primary volume before performing this recovery operation.**
Minimum role	manage

Syntax	`recover replication-set`
	`operation failover|failback-no-restore|reverse`
	`replication-set-ID`

Parameters	`operation failover` Moves the replication set into the "failed over" state, which is required for performing a subsequent recovery operation. You must run this on the secondary system. To use this option: • The replication set can be in any state except "failed over." • Peer communication can be online or offline.

	`failback-no-restore`
	Restores the replication set to functioning as it did before the failover operation was performed, without using updates made to the secondary volume while the replication set was failed over to the secondary system. You must run this on the secondary system. To use this option:
	● The replication set must be in the "failed over" state.
	● Peers must be operational with both systems healthy and communicating.
	`reverse`
	Restores the replication set to normal operation but with the replication roles reversed. You must run this on the secondary system. To use this option:
	● The replication set must be in the "failed over" state.
	● Peers must be operational with both systems healthy and communicating.
	`replication-set-ID`
	The name or serial number of the replication set. A name that includes a space must be enclosed in double quotes.

Examples	Assume that a disaster took the primary system for replication set RS1 offline. To move RS1 into "failed over" state and make its secondary volume accessible, you ran the following command:
	`# recover replication-set operation failover RS1`
	You then mapped the secondary volume and updates to its data started. Now repairs have been made, the primary system is back online, and peer communication has been reestablished. You want to replace the old data on the primary system with the current data on the secondary system. Also, you want to preserve the data state of volumes on the primary systems to avoid risk of data loss. You would do the following:
	1. On the primary system, snap local replication set volumes.
	2. On the secondary system:
	a. Snap local replication set volumes.
	b. Run: `recover replication-set operation reverse RS1`
	c. Run: `replicate RS1`
	3. On the primary system:
	a. Confirm that the replication has completed by periodically running:
	`show replication-sets RS1`
	b. Run: `recover replication-set operation failover RS1`
	c. Run: `recover replication-set operation reverse RS1`
	d. Reestablish primary volume mappings.

See also	create snapshots map volume show replication-sets

release volume

Description	Clears initiator registrations and releases persistent reservations for all or specified volumes. Normally, reservations placed on volumes by initiators accessing those volumes can be released by host software. This command should be used only when the system is in an abnormal state, perhaps due to a configuration problem, and you need to remove all reservations for specified volumes and return them to a “clean” state. **CAUTION: Releasing reservations for volumes may allow unintended access to those volumes by other initiators, which may result in data corruption. Before issuing this command, quiesce all host initiators that have visibility to the volumes whose reservations will be released.**
Minimum role	manage
Syntax	`release volume`

	`all|volumes`
Parameters	`all|volumes`Specifies all volumes, or a comma-separated list of the names or serial numbers of specific volumes. A name that includes a space must be enclosed in double quotes.
Examples	Release reservations for a specific volume. `# release volume vd04_v0002`
See also	show volume-reservations show volumes

remove disk-groups

Description	Removes specified disk groups. **CAUTION:** • **If your system gets into a state where a virtual disk group is quarantined or offline or does not have a corresponding pool, contact technical support.** • **Deleting a linear disk group will delete all data it contains.** If a specified disk group has a job running, such as media scrub, the command will prompt for confirmation to stop the job. For a linear disk group, if the group contains volumes, the command will prompt for confirmation to delete the volumes. If the reply is yes, the command will unmap and delete all volumes in the group, delete the group and corresponding pool, and make all the disks available. If the reply is no, the command will be canceled. For a virtual disk group, if the group contains no volume data, the group will be removed. If the group contains volume data, the command will initiate removal and try to drain (move) all volume data to other groups in the same pool. While data is being drained, the group's status will be `VDRAIN`. If the pool does not have enough space to contain the volume data, the command will immediately fail with an error. If draining begins and is successful, an event will be logged and the group will be removed. If draining begins but hosts continue to write new data to the volumes and cause amout-of-space condition, the command will fail and an event will be logged. **NOTE:** Disk group removal (draining) can take a very long time depending on a number of factors in the system, including but not limited to: large pool configuration; the amount of I/O traffic to the system (e.g., active I/O pages to the draining disk group); the type of the disk group page migration (enterprise SAS, midline SAS, SSD); the size of the draining disk group(s) in the system; and the number of disk groups draining at the same time. If you remove the last disk group in a virtual pool, the command will prompt for confirmation to remove the pool, too. If the reply is yes, the pool will be removed. If the reply is no, the disk group and the pool will remain. In one command you can delete linear and virtual disk groups, and disk groups from more than one pool. **NOTE:** • You cannot remove the last disk group from the only pool in a system that is used in a peer connection, or a disk group that contains a volume that is used in a replication set. • If you delete a quarantined disk group and its missing disks are later found, the group will reappear as quarantined or offline and you must delete it again (to clear those disks).
Minimum role	manage

Syntax	`remove disk-groups`
	`[prompt yes|no]`
	`disk-groups`

Parameters	`prompt yes|no`

	Optional. For scripting, this specifies an automatic reply to confirmation prompts: • `yes`: Allow the command to proceed. • no: Cancel the command. If this parameter is omitted, you must manually reply to prompts. `disk-groups` A comma-separated list of the names or serial numbers of the disk groups to delete. A name that includes a space must be enclosed in double quotes.
Examples	Remove disk groups `dg1` and `dg2`. `# remove disk-groups dg1,dg2`
See also	delete pools delete vdisks show disk-groups show vdisks

remove host-group-members

Description	Removes specified hosts from a host group. You cannot remove all hosts from a group. At least one host must remain. The hosts are ungrouped but not deleted. This command has a confirmation prompt in interactive console mode.
Minimum role	manage
Syntax	`remove host-group-members` `hosts` *`hosts`* *`host-group`*
Parameters	`hosts` *`hosts`* A comma-separated list of the names of hosts to remove from the host group. A name that includes a space must be enclosed in double quotes. `host-group` The name of the host group. A name that includes a space must be enclosed in double quotes.
Examples	Remove two hosts from a group that contains three hosts. `# remove host-group-members hosts Host2,Host3 HostGroup1`
See also	delete host-groups show host-groups show initiators

remove host-members

Description	Removes specified initiators from a host. You cannot remove all initiators from a host. At least one initiator must remain. The initiators are ungrouped but not deleted.
Minimum role	manage
Syntax	`remove host-members` `initiators` *`initiators`*

	host-name
Parameters	`initiators` *initiators* A comma-separated list of the names of initiators to remove from the host. A name that includes a space must be enclosed in double quotes. *host-name* The name of the host. A name that includes a space must be enclosed in double quotes.
Examples	Remove two initiators from a group that contains three initiators. `# remove host-members initiators FC-init2,FC-init3 FC-host11`
See also	delete hosts show initiators

remove ipv6-address

Description	Removes a static IPv6 address from a controller network port. **NOTE:** When the set ipv6-network-parameters command's autoconfig parameter is disabled, you cannot remove the last IPv6 address.
Minimum role	manage

Syntax	`remove ipv6-address`
	`[address-label` *name*`]`
	`[controller a|b]`
	`[index` *index*`]`
	`[ip-address` *IP-address*`]`

Parameters	The parameters must be used in one of these ways:
	• `controller` & `index`
	• `controller` & `address-label`
	• IP address
	`address-label name`
	Optional. Specifies the name assigned to the address.
	`controller a|b`
	Optional. Specifies whether to change controller A or B, only. If this parameter is omitted, changes affect the controller being accessed.
	`index` *index*
	Optional. A value from 0 to 3 that specifies the controller's index value for the address.
	`ip-address` *IP-address*
	Optional. Specifies the address to remove.

Examples	Remove the IPv6 address named `vlan1` from controller A. `# remove ipv6-address controller a address-label vlan1`
See also	add ipv6-address set ipv6-network-parameters show ipv6-addresses show ipv6-network-parameters

remove spares

Description	Removes specified spares. You can remove global spares and dedicated spares (linear storage only) in the same command. This command cannot be used to remove dedicated spares associated with a quarantined linear disk group (QTUN) that remains after upgrading from a system that supported both virtual and linear storage. Either move the disks to a system that supports linear storage or use the remove disk-groups command to remove the quarantined disk group, which will make its dedicated spares available.
Minimum role	manage
Syntax	`remove spares` *`disks`*
Parameters	*`disks`*The IDs of the spares to remove. For disk syntax, see Command syntax.

Examples	Remove dedicated spare 1.21 and global spare 1.22.
	`# remove spares 1.21-22`
	Remove global spare 1.22.
	`# remove spares 1.22`

See also	addd spares show disks

remove volume-group-members

Description	Removes volumes from a volume group. You cannot remove all volumes from a group. At least one volume must remain. The volumes are ungrouped but not deleted. **NOTE:** This command has a confirmation prompt in interactive console mode. For virtual storage, you cannot add a volume to a volume group that is in a replication set.
Minimum role	manage
Syntax	remove volume-group-members `volumes` *`volume-IDs`* *`volume-group`*
Parameters	`volumes` *`volume-IDs`* A comma-separated list of the names or serial numbers of volumes to remove from the volume group. A name that includes a space must be enclosed in double quotes. *`volume-group`*The name of the volume group. A name that includes a space must be enclosed in double quotes.
Examples	Remove volumes *`Vol0002`* and *`Vol0003`* from volume group *`VolumeGroup1`*. `# remove volume-group-members volumes Vol0002,Vol0003 VolumeGroup1`
See also	delete replication-set delete volume-groups show volume-groups show volumes

replicate

Description	Initiates replication of volumes in a replication set. This command must be run on the replication set's primary system. The initial replication may take a long time because it copies the allocated pages of the primary volume to the secondary volume. Subsequent replications are generally faster because those replications only copy changes made since the last successful replication. If a replication fails, the system suspends the replication set. The replication operation will attempt to resume if it has been more than 10 minutes since the replication set was suspended. If the operation has not succeeded after six attempts using the 10-minute interval, it will switch to trying to resume if it has been over an hour since the last attempt and the peer connection is healthy.
Minimum role	manage

Syntax	`replicate`
	`[last-snapshot]`
	`[snapshot` *`snapshot-ID`*`]`
	`replication-set-ID`

Parameters	`last-snapshot`
	Optional. Specifies to replicate the most recent snapshot of the primary volume, instead of the base volume. You cannot specify both this parameter and the snapshot parameter.
	`snapshot snapshot-ID`
	Optional. This advanced option enables you to replicate a particular snapshot of the primary volume, instead of the base volume or its most recent snapshot. You can specify the name or serial number of the snapshot to replicate. You cannot specify both this parameter and the `last-snapshot` parameter.
	NOTE: This operation can affect the order of replication revisions, making the secondary retention set confusing to understand.
	`replication-set-ID`
	The name or serial number of the replication set to replicate.

Examples	Replicate the volumes in replication set `RS1`.
	`# replicate RS1`
	Replicate the most recent snapshot of volumes in replication set `RS1`.
	`# replicate last-snapshot RS1`
	Replicate snapshot `RS1V1Snap3` in replication set `RS1`.
	`# replicate snapshot RS1V1Snap3 RS1`

See also	abort replication

rescan

Description	This command forces rediscovery of disks and enclosures in the storage system. **CAUTION: Performing a rescan will temporarily pause all I/O processes.** If both Storage Controllers are online and able to communicate with both expansion modules in each connected enclosure, this command rebuilds the internal SAS layout information, reassigns enclosure IDs based on controller A's enclosure cabling order, and ensures that the enclosures are displayed in the proper order. A manual rescan temporarily pauses all I/O processes, then resumes normal operation. It can take up to two minutes for the enclosure IDs to be corrected.

	A manual rescan may be needed after system power-up to display enclosures in the proper order. Whenever you replace a drive chassis or controller chassis, perform a manual rescan to force fresh discovery of all drive enclosures connected to the controller enclosure. A manual rescan is not needed after inserting or removing non-FDE disks because the controllers automatically detect these changes. When disks are inserted they are detected after a short delay, which allows the disks to spin up
Minimum role	manage
Syntax	`rescan`
Examples	Scan for device changes and re-evaluate enclosure IDs. `# rescan`

reset all-statistics

Description	Resets performance statistics for both controllers. You can specify either to reset all live statistics to zero, or to reset (clear) all historical performance statistics for all disks. If you reset historical statistics, an event will be logged and new data samples will continue to be stored every fifteen minutes.
Minimum role	manage

Syntax	`reset all-statistics`
	`[historical]`
	`[prompt yes|no]`

Parameters	`historical`Optional. Specifies to reset historical statistics instead of live statistics. If this parameter is omitted, the command will reset live statistics instead of historical statistics. `prompt yes|no`Optional. For scripting, this specifies an automatic reply to the confirmation prompt that will appear if the historical parameter is specified: • `yes`: Allow the command to proceed • `no`: Cancel the command If the `historical` parameter is specified and the prompt parameter is omitted, you must manually reply to the prompt. If the `historical` parameter is omitted, the prompt parameter has no effect. There is no confirmation prompt for live statistics

Examples	Reset all live statistics for both controllers.
	`# reset all-statistics`
	Reset all historical disk-performance statistics for both controllers.
	`# reset all-statistics historical`

See also	reset controller-statistics reset disk-error-statistics reset controller-statistics reset disk-group-statistics reset disk-statistics reset host-port-statistics reset pool-statistics reset vdisks-statistics reset volume-statistics

	show controller-statistics

reset controller-statistics

Description	Resets performance statistics for controllers. This command resets all controller statistics except `Power On Time` and `Total Power On Hours`.
Minimum role	manage
Syntax	`reset controller-statistics` `[a|b|both]`
Parameters	`a|b|both` Optional. Specifies whether to reset statistics for controller A, B, or both. If this parameter is omitted, statistics are reset for both controllers.
Examples	Reset statistics for both controllers. `# reset controller-statistics`
See also	reset all-statistics reset disk-error-statistics reset controller-statistics reset disk-group-statistics reset disk-statistics reset host-port-statistics reset pool-statistics reset vdisks-statistics reset volume-statistics show controller-statistics

reset disk-error-statistics

Description	Resets error statistics for all or specified disks. Statistics that are reset include: • Number of SMART events recorded • Number of I/O timeouts accessing the disk • Number of times the disk did not respond • Number of attempts by the controllers to spin up the disk • Number of media errors (errors generated by the disk as specified by its manufacturer) • Number of non-media errors (errors generated by the controllers or by the disk and not categorized as media errors) • Number of block reassignments • Number of bad blocks found To reset other disk statistics, use the reset disk-statistics command.
Minimum role	manage
Syntax	`reset disk-error-statistics` `[`*`disks`*`]`
Parameters	`disks`

	Optional. The IDs of the disks for which to reset statistics. For disk syntax, see Command syntax. If this parameter is omitted, statistics are reset for all disks
Examples	Reset error statistics for disks 1.1 and 2.1. `# reset disk-error-statistics 1.1,2.1`
See also	reset all-statistics reset controller-statistics reset disk-group-statistics reset disk-statistics reset host-port-statistics reset pool-statistics reset vdisks-statistics reset volume-statistics show disk-statisticsshow disks

reset disk-group-statistics

Description	Clears resettable performance statistics for specified disk groups, and resets timestamps for those statistics. This command behaves the same as the reset vdisks-statistics command.
Minimum role	manage
Syntax	`reset disk-group-statistics` *`disk-groups`*
Parameters	*`disk-groups`* Optional. A comma-separated list of the names or serial numbers of the disk groups for which to reset statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics are reset for all disk groups.
Examples	Reset statistics for disk group `dg1`. `# reset disk-group-statistics dg1`
See also	reset all-statistics reset disk-error-statistics reset controller-statistics reset disk-statistics reset host-port-statistics reset pool-statistics reset vdisks-statistics reset volume-statistics show controller-statistics show disk-group-statisticsshow disk-groups

reset disk-statistics

Description	Resets performance statistics for disks.

	This command resets basic disk statistics but not disk error statistics. To reset these, use the reset disk-error-statistics command. Lifetime statistics are not resettable.
Minimum role	manage
Syntax	`reset disk-statistics`
Examples	Reset statistics for all disks. `# reset disk-statistics`
See also	reset all-statistics reset disk-error-statistics reset controller-statistics reset disk-group-statistics reset host-port-statistics reset pool-statistics reset vdisks-statistics reset volume-statistics show disk-statistics

reset dns-management-hostname

Description	Resets each controller module's management host name to the factory default. The factory default is: *<SCSI-vendor-ID><midplane-serial-number><controller-ID>*.
Minimum role	manage
Syntax	`reset dns-management-hostname` `[controller a|b|both]`
Parameters	`controller a|b|both` Optional. Specifies whether to change controller A, B, or both. If this parameter is omitted, changes affect the controller being accessed.
Examples	Reset the domain host name for controller A. `# reset dns-management-hostname controller a`
See also	clear dns-parameters set dns-managment-hostname set dns-parameters show dns-management-hostnames show dns-parameters

reset host-link

Description	Resets specified controller host ports (channels). **CAUTION: Resetting host links may cause lost connection to hosts.** For FC, you can reset a single port. For an FC host port configured to use FC-AL (loop) topology, a reset issues a loop initialization primitive (LIP).

	For iSCSI, you can reset a port pair (either the first and second ports or the third and fourth ports). For SAS, you can reset a port pair (either the first and second ports or the third and fourth ports). Resetting a host port issues a COMINIT/COMRESET sequence and might reset other ports. This command has a confirmation prompt in interactive console mode.
Minimum role	manage
Syntax	`reset host-link` `ports` *`ports`*
Parameters	`ports` *`ports`* A controller host port ID, a comma-separated list of IDs, a hyphenated range of IDs, or a combination of these. A port ID is a controller ID and port number, and is not case sensitive. Do not mix controller IDs in a range.
Examples	Reset the host link on port A1. `# reset host-link ports A1`
See also	show ports

reset host-port-statistics

Description	Resets performance statistics for controller host ports.
Minimum role	manage
Syntax	`reset host-port-statistics` `[ports` *`ports`*`]`
Parameters	`[ports` *`ports`*`]` Optional. The controller ID and port number of ports for which to reset statistics. For port syntax, see Command syntax. If this parameter is omitted, statistics are reset for all controller host ports.
Examples	Reset statistics for all controller host ports. `# reset host-port-statistics`
See also	reset all-statistics reset controller-statistics reset disk-error-statistics reset disk-group-statistics reset disk-statistics reset pool-statistics reset vdisks-statistics reset volume-statistics show disk-statistics show host-port-statistics show ports

reset pool-statistics

Description	Clears resettable performance statistics for virtual pools, and resets timestamps for those statistics.

Minimum role	manage
Syntax	`reset pool-statistics` *`[pool]`*
Parameters	`pool` Optional. The name or serial number of the virtual pool for which to reset statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics are reset for both pools A and B.
Examples	Reset statistics for pool A. `# reset pool-statistics A`
See also	reset all-statistics reset disk-error-statistics reset controller-statistics reset disk-group-statistics reset host-port-statistics reset pool-statistics reset vdisks-statistics reset volume-statistics reset disk-statistics show pool-statistics show pools

reset smis-configuration

Description	Resets the SMI-S configuration files. **NOTE:** This command is for use by or with direction from a service technician. This command will reset the configuration of the SMI-S service to default settings. After running this command, any hosts registered via SMI-S will need to be registered again. Messages are displayed when the SMI-S configuration is reset and SMI-S is restarted.
Minimum role	manage

Syntax	`reset smis-configuration`
	`[a|b|both]`
	`[prompt yes|no]`
	`[noprompt]`

Parameters	`[a|b|both]` Optional. The controller module containing the controller to restart. If this parameter is omitted, the command affects the controller being accessed. `[prompt yes|no]` Optional. For scripting, this specifies an automatic reply to confirmation prompts: • `yes`: Allow the command to proceed. • `no`: Cancel the command. If this parameter is omitted, you must reply to prompts.`noprompt` Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.
Output	Messages are displayed when the SMI-S configuration is reset and SMI-S is restarted.

Examples	Reset the SMI-S configuration on controller A, to which you are logged in.
	`# reset smis-configuration a`
	From controller A, reset the SMI-S configuration on controller B.
	`# reset smis-configuration b`
	Reset the SMI-S configuration on both Storage Controllers.
	`# reset smis-configuration both`

See also	restore defaults

reset snapshot

Description	Replaces the data in a standard snapshot with the current data from its parent volume. The snapshot's volume characteristics are not changed.
	Any snapshot in a snapshot tree can be reset, but the data source can only be the snapshot's immediate parent. For example, in the following snapshot tree:Vol1
	`|- Vol1Snap`
	`|- Vol1SnapSnap`
	you can reset `Vol1Snap` to `Vol1`, or reset `Vol1SnapSnap` to `Vol1Snap`.
	The command will prompt you to unmount the snapshot from all hosts before starting the reset operation to avoid data loss.
	CAUTION: All data represented by the snapshot as it exists prior to issuing this command will be lost.

Minimum role	manage

Syntax	`reset snapshot`
	`[prompt yes|no]`
	`snapshot`

Parameters	`[prompt yes|no]` Optional. For scripting, this specifies an automatic reply to confirmation prompts: • `yes`: Allow the command to proceed. • `no`: Cancel the command. If this parameter is omitted, you must manually reply to prompts. *`snapshot`* The name or serial number of the snapshot to reset. A name that includes a space must be enclosed in double quotes.
Examples	Reset snapshot `Vol1Snap`. `# reset snapshot Vol1Snap`
See also	show snapshots

reset vdisk-statistics

Description	Resets performance statistics for all or specified linear disk groups. This command applies to linear storage only.
Minimum role	manage
Syntax	`reset vdisk-statistics` `[`*`vdisks`*`]`

Parameters	[*vdisks*] Optional. A comma-separated list of the names or serial numbers of the linear disk groups for which to reset statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics are reset for all linear disk groups.
Examples	Reset statistics for linear disk groups `VD1` and `MyVdisk`. `# reset vdisk-statistics VD1,MyVdisk`
See also	reset all-statistics reset disk-error-statistics reset controller-statistics reset disk-group-statistics reset host-port-statistics reset pool-statistics reset vdisks-statistics reset volume-statistics reset disk-statistics show vdisk-statistics show vdisks

reset volume-statistics

Description	Resets performance statistics for all or specified volumes.
Minimum role	manage
Syntax	reset volume-statistics [*volumes*]
Parameters	*volumes* Optional. A comma-separated list of the names or serial numbers of the volumes for which to reset statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics are reset for all volumes.
Examples	Reset statistics for volume *vd1_v0001*. `# reset volume-statistics vd1_v0001`
See also	reset all-statistics reset disk-error-statistics reset controller-statistics reset disk-group-statistics reset host-port-statistics reset pool-statistics reset vdisks-statistics reset volume-statistics reset disk-statistics show volumes

restart mc

Description	Restarts the Management Controller in a controller module. When you restart a Management Controller, communication with it is lost until it successfully restarts. If the restart fails, the partner Management Controller remains active with full ownership of operations and configuration information.
Minimum role	manage

Syntax	`restart mc`
	`[a|b|both]`
	`[noprompt]`

Parameters	`[a|b|both]`
	Optional. The controller module containing the controller to restart. If this parameter is omitted, the command affects the controller being accessed.
	`[noprompt]`
	Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

Output	Messages are displayed when the controller shut down, when failover is initiated, and when the controller has restarted.
Examples	Restart the Management Controller in controller A, to which you are logged in. `# restart mc a`
See also	restart sc shutdown

restart sc

Description	Restarts the Storage Controller in a controller module. When you restart a Storage Controller, it attempts to shut down with a proper failover sequence, which includes stopping all I/O operations and flushing the write cache to disk, and then the Storage Controller restarts. Restarting a Storage Controller restarts the corresponding Management Controller. **CAUTION:** • **Depending on the mapping configuration, restarting one Storage Controller may cause loss of access to data.** • **If you restart both Storage Controllers, all hosts will lose access to the system and its data until the restart is complete. Additionally, both Management Controllers will be restarted and all users' sessions will need to be restarted.** **NOTE:** When a Storage Controller is restarted, live performance statistics that it recorded will be reset. Historical performance statistics are not affected. In a dual-controller system, disk statistics may be reduced but will not be reset to zero, because disk statistics are summed between the two controllers. For more information, see help for commands that show statistics.
Minimum role	manage

Syntax	`restart sc`
	`[a|b|both]`
	`[noprompt]`

Parameters	`[a|b|both]`
	Optional. The controller module containing the controller to restart. If this parameter is omitted, the command affects the controller being accessed.
	`[noprompt]`
	Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction
	.

Output	Messages are displayed when the controller shut down, when failover is initiated, and when the controller has restarted.

Examples	From controller A, restart the Storage Controller in controller B.
	`# restart sc b`
	Restart both Storage Controllers.
	`# restart sc both`

See also	restart mc shutdown

restore defaults

Description	Restores the default configuration on the controllers. **CAUTION: This command is for use only with the direction from a service technician.** For details about which settings are restored, see Settings changed by restore defaults. **NOTE:** This command restores the default settings to the controllers and restarts each controller module. Changes to host interface settings may cause loss of data availability and require some reconfiguration to restore host access to volumes. Changes to network-port IP addresses may cause loss of access to management interfaces.
Minimum role	manage

Syntax	`restore defaults`
	`[noprompt]`
	`[prompt yes|no]`

Parameters	`[noprompt]`
	Optional. Suppresses confirmation prompts. Specifying this parameter enables the command to proceed without user interaction.
	`[prompt yes|no]`
	• `yes`: Allow the command to proceed.
	• `no`: Cancel the command.
	If this parameter is omitted, you must manually reply to prompts.

Examples	Restore the default configuration on the controllers. `# restore defaults`
See also	reset smis-configuration restart mc restart sc

resume replication-set

Description	Resumes the replication operations for the specified replication set. This command applies to virtual storage only. You can run this command on the primary system. When a replication set is suspended, all replications in progress are paused and no new replications are allowed to start. When you run this command to resume replications, all paused replications are resumed and new replications are allowed to occur. If you aborted a replication while the replication set was suspended, the aborted replication does not resume.
Minimum role	manage
Syntax	`resume replication-set` *`replication-set-ID`*
Parameters	*`replication-set-ID`* The name or serial number of the replication set for which to resume the replication.
Examples	Resume replications in replication set `RS1`. `# resume replication-set RS1`
See also	create replication-set delete replication-set set replication-set show replication-sets suspend replication-set

rollback volume

Description	Replaces the data in a parent volume with the data from one of its snapshots. This reverts the volume data to its state at an earlier point in time. The volume's characteristics are not changed.
	Any parent volume in a snapshot tree can be rolled back, but the data source must be a direct child snapshot. For example, in the following snapshot tree:
	`Vol1`
	`|- Vol1Snap`
	`|- Vol1SnapSnap`
	you can roll back `Vol1` from `Vol1Snap`, or roll back `Vol1Snap` from `Vol1SnapSnap`.
	The command will prompt you to unmount the volume and the snapshot from all initiators before starting the rollback operation to avoid data loss.
	CAUTION: All data that differs between the parent volume and the snapshot will be lost. Create a snapshot of the parent volume as it currently exists before performing a rollback.
	NOTE: For virtual storage, you cannot exclude modified write data in a snapshot from being used in a rollback. If you will want to do that, plan ahead and take a snapshot of the original snapshot before writing to it. Make the child snapshot read-only and use it for the rollback.

Minimum role	manage

Syntax	`rollback volume`
	`[prompt yes|no]`
	`snapshot` *`snapshot`*

	volume
Parameters	`[prompt yes|no]` Optional. For scripting, this specifies an automatic reply to confirmation prompts: • `yes`: Allow the command to proceed. • `no`: Cancel the command. If this parameter is omitted, you must manually reply to prompts. `snapshot` *snapshot* The name or serial number of the snapshot containing the data to roll back to. A name that includes a space must be enclosed in double quotes. *volume*The name or serial number of the volume to roll back. A name that includes a space must be enclosed in double quotes.
Examples	Roll back volume *Vol1* from snapshot *Vol1Snap*. `# rollback volume snapshot Vol1Snap Vol1`
See also	show snapshots show volumes

scrub disk-groups

Description	Analyzes specified disk groups to find and fix errors. This command acts on disks in a disk group but not dedicated spares or leftover disks. The command will fix parity mismatches for ADAPT and for RAID 5 and RAID 6, as well as for linear disk groups utilizing RAID 3 and RAID 50; find but not fix mirror mismatches for RAID 1 and 10; and fix media errors for all RAID levels. Disk-group scrub can last over an hour, depending on disk-group size, utility priority, and amount of I/O activity. However, a manual scrub performed with this command is typically faster than a background scrub enabled with the set advanced-settings command. You can use a disk group while it is being scrubbed. To check the progress of a disk-group scrub (VRSC) job, use the `show disk-groups` command. When a disk-group scrub job starts, event 206 is logged. When a scrub job ends, event 207 is logged and specifies whether errors were found and whether user action is required.
Minimum role	manage
Syntax	`scrub disk-groups` *disk-groups*
Parameters	*disk-groups*A comma-separated list of the names or serial numbers of the disk groups to scrub. A name that includes a space must be enclosed in double quotes.
Examples	Start scrubbing disk group `dg1`. `# scrub disk-groups dg1`
See also	abort scrub set advanced-settings show disk-groups

scrub vdisk

Description	Analyzes specified linear disk groups to find and fix disk errors. This command applies to linear storage only. This command acts on disks in a linear disk group but not dedicated spares or leftover disks. This command will fix parity mismatches for RAID 3, 5, 6, and 50; find mirror mismatches for RAID 1 and 10; and fix media errors for all RAID levels. Linear disk-group scrub can last over an hour, depending on disk-group size, utility priority, and amount of I/O activity. However, a "foreground" scrub performed with this command is typically faster than a background scrub enabled with the set advanced-settings command. You can use a disk group while it is being scrubbed. To check the progress of a linear disk-group scrub (VRSC) job, use the show vdisks command. When a disk-group scrub job starts, event 206 is logged. When the scrub job ends, event 207 is logged and specifies whether errors were found and whether user action is required.
Minimum role	manage
Syntax	`scrub vdisk` *`vdisks`*
Parameters	*`vdisks`*A comma-separated list of the names or serial numbers of the linear disk groups to scrub. A name that includes a space must be enclosed in double quotes
Examples	`Start scrubbing linear disk group vd1.` `# scrub vdisk vd1`
See also	set advanced-settings show vdisks abort scrub (with the `vdisk` parameter)

scrub volume

Description	Analyzes specified volumes to find and fix disk errors. This command applies to linear storage only. This command acts on the disk portions spanned by each volume, but it does not act on dedicated spares or leftover disks. This command will fix parity mismatches for RAID 3, 5, 6, and 50; find mirror mismatches for RAID 1 and 10; and fix media errors for all RAID levels. Volume scrub can last over an hour, depending on volume size, utility priority, and amount of I/O activity. You can use a volume while it is being scrubbed. To check the progress of a volume scrub job, use the show volumes command. **NOTE:** Only one scrub operation can be running on a linear disk group at a time. If a manual scrub is started while a background scrub is in progress, the background scrub will terminate and will start over 24 hours after the manual scrub completes. When a scrub is complete, event 207 is logged and specifies whether errors were found and whether user action is required.
Minimum role	manage
Syntax	`scrub volume` *`volumes`*
Parameters	*`volumes`* The names or serial numbers of the volumes to scrub. A name that includes a space must be enclosed in double quotes.

Examples	Start scrubbing volume `vol1`. `# scrub volume vol1`
See also	set advanced-settings abort scrub (with the `volume` parameter) show volumes

send support-assist-logs

Description	Sends storage-system log files to the SupportAssist server. Use this command to force collection and transmittal of log data to the server, instead of waiting for the SupportAssist feature to do so automatically. Data collected and sent includes: • Current configuration state of the storage system • XML API dump of the system • Event log • Full debug log Data for both controllers is sent in a single zip file.
Minimum role	monitor
Syntax	`send support-assist-logs`
Examples	Send storage-system log files to the SupportAssist server. `# send support-assist-logs`
See also	check support-assist set support-assist set support-assist-info show support-assist

set advanced-settings

Description	Sets advanced system configuration parameters.
Minimum role	manage

Syntax	`set advanced-settings`
	`[auto-stall-recovery enabled|disabled|on|off]`
	`[auto-write-back enabled|disabled|on|off]`
	`[background-disk-scrub enabled|disabled|on|off]`
	`[background-scrub enabled|disabled|on|off]`
	`[background-scrub-interval` *`interval`*`]`
	`[compact-flash-failure enabled|disabled|on|off]`
	`[controller-failure enabled|disabled|on|off]`
	`[dynamic-spares enabled|disabled|on|off]`
	`[emp-poll-rate` *`rate`*`]`
	`[fan-failure enabled|disabled|on|off]`
	`[host-cache-control enabled|disabled|on|off]`

	`[large-pools enabled|disabled|on|off]`
	`[managed-logs enabled|disabled|on|off]`
	`[missing-lun-response notready|illegal]`
	`[partner-firmware-upgrade enabled|disabled|on|off]`
	`[partner-notify enabled|disabled|on|off]`
	`[power-supply-failure enabled|disabled|on|off]`
	`[restart-on-capi-fail enabled|disabled|on|off]`
	`[single-controller]`
	`[smart enabled|disabled|on|off|detect-only]`
	`[spin-down enabled|disabled|on|off]`
	`[spin-down-delay delay]`
	`[super-cap-failure enabled|disabled|on|off]`
	`[sync-cache-mode immediate|flush]`
	`[temperature-exceeded enabled|disabled|on|off]`
	`[utility-priority low|medium|high]`

Parameters	`auto-stall-recovery enabled|disabled|on|off`
	Optional. Detects situations where a controller stall is preventing I/O operations from completing, and recovers the system so that at least one controller is operational, thus avoiding data-unavailability situations. This feature focuses on failover/recovery stalls. When a stall is detected, event 531 is logged.
	● `disabled` or `off`: Auto stall recovery is disabled. The system will constantly perform auto stall detection in the background but will not automatically perform recovery actions.
	● `enabled` or `on`: Auto stall recovery is enabled. The system will constantly perform auto stall detection in the background and automatically perform recovery actions. This is the default.
	`auto-write-back enabled|disabled|on|off`
	Optional. Sets whether the cache mode will change from write-through to write-back when the trigger condition is cleared.
	`disabled` or `off`: Auto-write-back is disabled.
	`enabled` or `on`: Auto-write-back is enabled. This is the default.
	`background-disk-scrub enabled|disabled|on|off`
	Optional. Sets whether disks that are not in disk groups are automatically checked for disk defects to ensure system health. The interval between background disk scrub finishing and starting again is 72 hours. The first time you enable this parameter, background disk scrub will start with minimal delay. If you disable and then re-enable this parameter, background disk scrub will start 72 hours after the last background disk scrub completed.
	● `disabled` or `off`:Background disk scrub is disabled. This is the default.
	● `enabled` or `on`: Background disk scrub is enabled.
	`background-scrub enabled|disabled|on|off`
	Optional. Sets whether disks in disk groups are automatically checked for disk defects to ensure system health. The interval between background disk-group scrub finishing and starting again is specified by the `background-scrub-interval` parameter.
	● `disabled` or `off`:Background disk-group scrub is disabled. This is the default.
	● `enabled` or `on`: Background disk-groupscrub is enabled.
	`background-scrub-interval` *`interval`*
	Optional. Sets the interval in hours between background disk-group scrub finishing and starting again, from 0 to 360 hours. The default is 24 hours.
	`compact-flash-failure enabled|disabled|on|off`

Optional. Sets whether the cache policy will change from write-back to write-through when CompactFlash memory is not detected during POST (Power-On Self-Test), fails during POST, or fails during controller operation.

- `disabled` or `off`:The CompactFlash failure trigger is disabled.
- `enabled` or `on`: The CompactFlash failure trigger is enabled. This is the default.

`controller-failure enabled|disabled|on|off`

Optional. Sets whether the cache policy will change from write-back to write-through when a controller fails.

- `disabled` or `off`: The controller failure trigger is disabled. This is the default.
- `enabled` or `on`: The controller failure trigger is enabled.

`dynamic-spares enabled|disabled|on|off`

Optional. Enables or disables the dynamic spares feature. This feature lets you use all of your disks in fault-tolerant disk groups without designating a disk as a spare. With dynamic spares enabled, if a disk fails and you replace it with a compatible disk, the storage system rescans the bus, finds the new disk, automatically designates it a spare, and starts reconstructing the disk group. A compatible disk has enough capacity to replace the failed disk and is the same type. If a spare or available compatible disk is already present, the dynamic spares feature uses that disk to start the reconstruction and the replacement disk can be used for another purpose.

- `disabled` or `off`: The dynamic spares feature is disabled. This is the default.
- `enabled` or `on`: The dynamic spares feature is enabled.

`emp-poll-rate rate`

Optional. Sets the interval at which the storage system will poll each enclosure's Enclosure Management Processor (EMP) for status changes, from 5 to 3600 seconds. Typically you can use the default, 5 seconds.

- Increasing the interval might slightly improve processing efficiency, but changes in device status are communicated less frequently. For example, this increases the amount of time before LEDs are updated to reflect status changes.
- Decreasing the interval slightly decreases processing efficiency, but changes in device status are communicated more frequently. For example, this decreases the amount of time before LEDs are updated to reflect status changes.

`fan-failure enabled|disabled|on|off`

Optional. Sets whether the cache policy will change from write-back to write-through when a fan fails.

- `disabled` or `off`: The fan failure trigger is disabled. This is the default.
- `enabled` or `on`: The fan failure trigger is enabled.

`host-cache-control enabled|disabled|on|off`

Optional. Sets whether hosts are allowed to use the SCSI MODE SELECT command to change the storage system's write-back cache setting.

- `disabled` or `off`: Host control of caching is disabled. This is the default.
- `enabled` or `on`: Host control of caching is enabled.

`large-pools enabled|disabled|on|off`

Optional. Enables or disables the capability to create a virtual pool larger than 512 TiB on each controller by limiting the number of user-defined snapshots that can be created in snapshot trees.

- `disabled` or `off`: The maximum size for a virtual pool will be 512 TiB. The maximum number of volumes per snapshot tree will be 255 (base volume plus 254 snapshots). This is the default. You can disable this setting only if each pool is less than 512 TiB.
- `enabled` or `on`: The maximum size for a virtual pool will be 1024 TiB (1 PiB). The maximum number of volumes per snapshot tree will be 9 (base volume plus 8 snapshots). You can enable this setting only if no snapshot tree has more than 15 volumes.

Changing the `large-pools` setting will automatically restart both controllers, during which time data will be unavailable.

`managed-logs enabled|disabled|on|off`

Optional. Enables or disables the managed logs feature, which allows log files to be transferred from the storage system to a log collection system to avoid losing diagnostic data.

- `disabled` or `off`: The managed logs feature is disabled. This is the default.
- `enabled` or `on`:The managed logs feature is enabled.

`missing-lun-response notready|illegal`

Optional. Some operating systems do not look beyond LUN 0 if they do not find a LUN 0 or cannot handle noncontiguous LUNs. This parameter handles these situations by enabling the host drivers to continue probing for LUNs until they reach the LUN to which they have access. This parameter controls the SCSI sense data returned for volumes that are not accessible because they don't exist or have been hidden through volume mapping (this does not apply to volumes of offline disk groups). Use the default option, notready, unless the system is used in a VMware environment or a service technician asks you to change it to work around a problem.

- `not ready`: Sends a reply that there is a LUN where a gap has been created but that it's "not ready." Sense data returned is sensekey = 2, code = 4, qualifier = 3. This option is the default.
- `illegal`: Sends a reply that there is a LUN but that the request is "illegal." Sense data returned is sensekey = 5, code = 25h, qualifier = 0. If the system is used in a VMware environment, use this option.

`partner-firmware-upgrade enabled|disabled|on|off`

Optional. Sets whether component firmware versions are monitored and will be automatically updated on the partner controller.

- `disabled` or `off`: Partner firmware upgrade is disabled.
- `enabled` or `on`: Partner firmware upgrade is enabled. This is the default.

`partner-notify enabled|disabled|on|off`

Optional. Sets whether to notify the partner controller that a trigger condition occurred. Enable this option to have the partner also change to write-through mode for better data protection. Disable this option to allow the partner to continue using its current caching mode for better performance.

Optional. Sets whether to notify the partner controller that a trigger condition occurred. Enable this option to have the partner also change to write-through mode for better data protection. Disable this option to allow the partner continue using its current caching mode for better performance.

- `disabled` or `off`:Notification is disabled. This is the default
- `enabled` or `on`:Notification is enabled.

`power-supply-failure enabled|disabled|on|off`

Optional. Sets whether the cache policy automatically changes to write-through when a power supply fails.

- `disabled` or `off`:The power-supply failure trigger is disabled. This is the default.
- `enabled` or `on`:The power-supply failure trigger is enabled.

`restart-on-capi-fail enabled|disabled|on|off`

Optional. Sets whether a Storage Controller that experiences a CAPI hang will be forced to restart. This is disabled by default. A CAPI hang is perceived as a management-interface hang. As part of the restart process, a dump file is created and event 107 is logged. To provide the dump file to technical support for debugging, use the Save Logs action in the PowerVault Manager.

`single-controller`

For use by a service technician only.

Optional. For a system that lacks a second controller module for redundancy and is intended to be used as a single-controller system, this parameter changes the operating/redundancy mode to Single Controller. This prevents the system from reporting the absent partner controller as an error condition. This parameter does not affect any other system settings. Installing a second, functional controller module will change the mode to Active-Active ULP.

`smart enabled|disabled|on|off|detect-only`

Optional. Enables or disables SMART (Self-Monitoring Analysis and Reporting Technology) monitoring for all disks in the storage system. When SMART is enabled, the system checks for SMART events one minute after a restart and every five minutes thereafter. SMART events are recorded in the event log.

	• `disabled` or `off`:Disables SMART for all disks in the system and for all disks added to the system.
	• `enabled` or `on`:Enables SMART for all disks in the system and for all disks added to the system. This is the default.
	• `detect-only`: Detects but does not change the SMART setting of each disk in the system, and for each new disk added to the system.
	`spin-down enabled|disabled|on|off`
	Optional. Sets whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the `spin-down-delay` parameter.
	• `disabled` or `off`:Drive spin down for available disks and global spares is disabled. This is the default. Disabling spin down will set the spin-down delay to 0.
	• `enabled` or `on`:Drive spin down for available disks and global spares is enabled. If the spin-down-delay parameter is not specified, the delay will be set to 60 minutes.
	NOTE: Drive spin down is not applicable to ADAPT disk groups or virtual pools.
	`spin-down-delay` *`delay`*
	Optional. Sets the period of inactivity after which spinning disks that are available or are global spares will spin down. Setting the delay to 1–360 minutes will enable spin down. Setting the delay to 0 will disable spin down. The default is 15 minutes.
	NOTE: Drive spin down is not applicable to ADAPT disk groups or virtual pools.
	`super-cap-failure enabled|disabled|on|off`
	Optional. Sets whether the cache policy will change from write-back to write-through when the supercapacitor that provides backup power for cache is not fully charged or fails.
	• `disabled` or `off`:The supercapacitor failure trigger is disabled.
	• `enabled` or `on`:The supercapacitor failure trigger is enabled. This is the default.
	`sync-cache-mode immediate|flush`
	Optional. Sets how the SCSI `SYNCHRONIZE CACHE` command is handled.
	• `immediate`: Good status is returned immediately and cache content is unchanged. This option is the default.
	• `flush`: Good status is returned only after all write-back data for the specified volume is flushed to disk.
	`temperature-exceeded enabled|disabled|on|off`
	Optional. Sets whether the system will shut down a controller when its temperature exceeds the critical operating range.
	• `disabled` or `off`:The over-temperature trigger is disabled. This is the default.
	• `enabled` or `on`:The over-temperature trigger is enabled.
	`utility-priority low|medium|high`
	Optional. Sets the priority at which data-redundancy utilities, such as disk-group verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect disk-group background scrub, which always runs at “background” priority.)
	• `high`: Utilities have higher priority than host I/O. Use when your highest priority is to return the system to a fully fault-tolerant state. This can cause heavy I/O to be slower than normal. This is the default.
	• `medium`: Utility performance is balanced with host I/O performance.
	• `low`: Utilities run at a slower rate with minimal effect on host I/O. Use when streaming data without interruption, such as for a web server, is more important than data redundancy.

Examples	Enable partner firmware upgrade.
	`# set advanced-settings partner-firmware-upgrade enabled`
	Enable managed logs.
	`# set advanced-settings managed-logs enabled`
	Disable auto stall recovery.

	`# set advanced-settings auto-stall-recovery disabled`
See also	add spares remove spares scrub disk-groups scrub vdisk show advanced-settings

set chap-record

Description	Changes an iSCSI originator's CHAP record. You can change the record's secret, mutual name, and mutual secret values. This command is permitted whether or not CHAP is enabled. For a login request from an initiator to a storage system, the initiator is the originator and the storage system is the recipient. Because CHAP works during login, to make CHAP changes take effect you must reset any active iSCSI host links. **NOTE:** For information about setting up CHAP for use in a peer connection, see the topic about creating a peer connection in the *Dell EMC PowerVault ME4 Series Storage System Administrator's Guide*.
Minimum role	manage

Syntax	`set chap-record`
	`name` *`originator-name`*
	`[secret` *`originator-secret`*`]`
	`[mutual-name` *`recipient-name`* `mutual-secret` *`recipient-secret`*`]`

Parameters	`name` *`originator-name`* The originator name, typically in IQN format. `secret` *`originator-secret`* The secret that the recipient uses to authenticate the originator. The secret is case sensitive and can include 12–16 bytes. The value can include spaces and printable UTF-8 characters except: " < `mutual-name` *`recipient-name`* Optional; for mutual CHAP only. The recipient name, typically in IQN format. The name is case sensitive and can have a maximum of 223 bytes, including 0–9, lowercase a–z, hyphen, colon, and period. To determine a storage system's IQN, use the show ports command to view the Target ID value for an iSCSI port. This parameter and mutual-secret must be set together. `mutual-secret` *`recipient-secret`* Optional; for mutual CHAP only. The secret that the originator uses to authenticate the recipient. The secret is case sensitive, can include 12–16 bytes, and must differ from the originator secret. The value can include spaces and printable UTF-8 characters except: " < A storage system's secret is shared by both controllers. This parameter and mutual-name must be set together
Examples	For mutual CHAP, add a recipient name and secret to a CHAP record. `# set chap-record name iqn.1991-05.com.microsoft:myhost.domain secret 123456abcDEF mutual-name iqn.1995-03.com.acme:01.storage.00c0ffd6000a mutual-secret ABCdef123456(2012-01-21 11:54:33)`
See also	create chap-record delete chap-records

	show chap-records show iscsi-parameters show ports

set cli-parameters

Description	Sets options that control CLI behavior. If you are accessing the CLI through the network port, settings apply to the current CLI session only. If you are accessing the CLI through the enclosure's CLI port, settings persist across sessions. The base, locale, precision, temperature scale, timeout, and units settings are read from the user's account, and can be overridden by using this command.
Minimum role	monitor

Syntax	`set cli-parameters [base 2|10]`
	`[console|api|api-embed|ipa|json|wbi]`
	`[brief enabled|disabled|on|off]`
	`[locale English|en|Spanish|es|French|fr|German|de|Japanese|ja|Korean|ko|Chinese-simplified| zh-s]`
	`[pager enabled|disabled|on|off]`
	`[precision #]`
	`[storage-size-base 2|10]`
	`[storage-size-precision #]`
	`[storage-size-units auto|MB|GB|TB]`
	`[temperature-scale celsius|c|fahrenheit|f]`
	`[timeout #]`
	`[units auto|MB|GB|TB]`

Parameters	`base 2|10`
	Optional. Sets the base for entry and display of storage-space sizes:
	• `2`: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude. In base 2 when you set a size, whether you specify a base-2 or base-10 size unit, the resulting size will be in base 2.
	• `10`: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. This is the default. In base 10 when you set a size, the resulting size will be in the specified size unit. This option is the default.
	Operating systems usually show volume size in base 2. Disk drives usually show size in base 10. Memory (RAM and ROM) size is always shown in base 2.
	`console|api|api-embed|ipa|json|wbi`
	Optional. Sets the output format:
	• `console`: Supports interactive use of the CLI by displaying command output in easily readable format. This format automatically sizes fields according to content and adjusts content to window resizes. This is the default.
	• `api`: Supports scripting by displaying command output in XML. All objects are displayed at the same level, related by COMP elements.
	• `api-embed`: Alternate form of XML output which displays "child" objects embedded (indented) under "parent" objects. Enabling this option enables the brief parameter.
	• `ipa`: Alternate form of XML output which displays as api-embed format with brief mode enabled.
	• `json`: Standard JavaScript Object Notation (JSON) output.
	• `wbi`: A JSON-like format used internally by the PowerVault Manager.
	`brief enabled|disabled|on|off`

	Optional.
	● `enabled` or `on`: In XML output, this setting shows a subset of attributes of object properties. The name and type attributes are always shown.
	● `disabled` or `off`: In XML output, this setting shows all attributes of object properties. This is the default.
	`locale English|en|Spanish|es|French|fr|German|de|Japanese|ja|Korean|ko|Chinese-simplified|zh-s`
	Optional. The display language. The default is English.
	`pager enabled|on|disabled|off`
	Optional.
	● `enabled` or `on`: Halts output after each full screen to wait for keyboard input. This is the default.
	● `disabled` or `off`: Output is not halted. When displaying output in API format, which is intended for scripting, disable paging.
	`precision #`
	Optional. Sets the number of decimal places (1–10) for display of storage-space sizes. The default is1.
	`storage-size-base 2|10`
	Optional. Alias for `base`.
	`storage-size-precision #`
	Optional. Alias for `precision`.
	`storage-size-units auto|MB|GB|TB`
	Optional. Alias for `units`.
	`temperature-scale celsius|c|fahrenheit|f`
	Optional. Sets the scale for display of temperature values:
	● `fahrenheit` or `f`: Temperatures are shown in degrees Fahrenheit.
	● `celsius` or `c`: Temperatures are shown in degrees Celsius. This is the default.
	`timeout #`
	Optional. Sets the timeout value in seconds for the login session. Valid values are 120–43200 seconds (2–720 minutes). The default is 1800 seconds (30 minutes).
	`units auto|MB|GB|TB`
	Optional. Sets the unit for display of storage-space sizes:
	● `auto`: Sizes are shown in units determined by the system. This is the default.
	● `MB`: Sizes are shown in megabytes.
	● `GB`: Sizes are shown in gigabytes.
	● `TB`: Sizes are shown in terabytes.
	Based on the precision setting, if a size is too small to meaningfully display in the selected unit, the system uses a smaller unit for that size. For example, if units is set to TB, precision is set to 1, and base is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.

Examples	Set CLI parameters.
	`# set cli-parameters timeout 600 console pager off precision 2 units GB temperature-scale f`
	For scripting, display XML output in `api-embed` format and disable paging.
	`# set cli-parameters api-embed pager off`
	For scripting, display brief XML output in `api-embed` format and disable paging.
	`# set cli-parameters api-embed pager off brief on`
	Set the CLI to show output in console format.
	`# set cli-parameters console`
	Set the CLI to show output in JSON format.

	# set cli-parameters json Set the CLI to use virtual management mode. `# set cli-parameters management-mode virtual`
See also	show cli-parameters

set cloud-iq

Description	Enables or disables the ability to use the Dell EMC CloudIQ application on a remote device to monitor, analyze, and troubleshoot the storage environment. Storage-system configuration data is sent hourly and performance data is sent every 15 minutes. CloudIQ cannot be used until the SupportAssist agreement is accepted and SupportAssist is enabled. When the agreement is accepted and SupportAssist is first enabled, CloudIQ is automatically enabled. Thereafter, SupportAssist and CloudIQ can be disabled or enabled independently.
Minimum role	standard
Syntax	`set cloud-iq` `[enabled|disabled|on|off]`
Parameters	`enabled|disabled|on|off` At least one parameter must be specified. • `enabled` or `on`: Enables use of the CloudIQ application. • `disabled` or `off`: Disables use of the CloudIQ application. This is the default.
Examples	Disable use of CloudIQ. `# set cloud-iq disabled`
See also	show cloud-iq set support-assist

set controller-date

Description	Sets the date and time parameters for the system. You can set the date and time manually or configure the system to communicate with a Network Time Protocol (NTP) server. Alternatively, you can configure NTP by using the set ntp-parameters command. **NOTE:** • If you specify valid NTP parameters and manual date/time parameters in the same command, the NTP parameters will take precedence. If the NTP server cannot be contacted, the date and time will not be changed and no error message will be displayed. If you specify the `timestamp` parameter and other manual date/time parameters in the same command, the `timestamp` parameter will take precedence. • If you change the time zone of the secondary system in a replication set whose primary and secondary systems are in different time zones, you must restart the system to enable management interfaces to show proper time values for replication operations.
Minimum role	manage

Syntax	To set the date and time manually:
	`set controller-date`
	`jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec`

	day hh:mm:ss year To set the date and time manually by specifying a timestamp: set controller-dat timestamp *timestamp* timezone +|-*hh*[:*mm*] To configure use of NTP: set controller-date ntp enabled|disabled|on|off ntpaddress *address* timezone +|-*hh*[:*mm*]
Parameters	jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec The month. day The day number (1–31). hh:mm:ss The hour (0–23), the minutes (0–59), and the seconds (0–59). year The year as a four-digit number. ntp enabled|disabled|on|off Enables or disables use of NTP. When NTP is enabled and the specified NTP server is available, each controller's time is synchronized with the server. This is disabled by default. ntpaddress *address* The network address of an available NTP server. The value can be an IPv4 address, IPv6 address, or FQDN. timezone +|-hh[:mm] The system's time zone as an offset in hours (-12 through +14) and optionally minutes (00–59) from Coordinated Universal Time (UTC). To specify a positive offset, the '+' is optional. To specify a negative offset, the '-' is required. The hour value can have one or two digits and can omit a leading zero. If the minutes value is specified it must have two digits. If it is omitted, the minutes value is set to 00. timestamp *timestamp* The date and time represented as the number of seconds (not counting leap seconds) that have elapsed since 1970-01-01 00:00:00 UTC. The resulting time will be in UTC, unless you also specify the timezone parameter.
Examples	Manually set the system time and date to 1:45 PM on September 22, 2011. # set controller-date sep 22 13:45:0 2011 Manually set the system date and time to 4:30:50 PM on November 2, 2011 by specifying a timestamp and an offset for the Central Time zone. # set controller-date timestamp 1320273050 timezone -6 Set the system to use NTP with an offset for the Mountain Time zone. # set controller-date ntp enabled ntpaddress 69.10.36.3 timezone -7 Set the system to use NTP with an offset for the Bangalore, India, time zone. # set controller-date ntp enabled ntpaddress 69.10.36.3 timezone +5:30

See also	set ntp-parameters show controller-date show ntp-status

set disk

Description	Performs a secure erase on a specified disk. This is called repurposing the disk, and only applies to an FDE-capable disk. This command can only be run on disks whose status is AVAIL, or UNUSABLE due to having a foreign lock key. AVAIL disks have had all disk group information removed from them. Secure erasing such disks is an extra step to make all data on the disk irretrievable. Disks that are UNUSABLE due to having a foreign lock key can be imported by using the set fde-import-key command. **NOTE:** If you want to repurpose more than one disk and the drive spin down (DSD) feature is enabled, disable DSD before repurposing the disks. You can re-enable it after the disks are repurposed. For information about disabling and enabling DSD for spinning disks that are available or are global spares, see information about the set advanced-settings command's spin-down parameter.
Minimum role	manage

Syntax	`set disk`
	`[noprompt]`
	`repurpose`
	`disk`

Parameters	`noprompt`
	Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.
	`repurpose`
	Specifies to secure erase the specified disk.
	`disk`
	The ID of the disk to be repurposed. Only one disk may be repurposed at a time. For disk syntax, see Command syntax.

Examples	In a system whose FDE security status is `Secured`, `Unlocked`, perform a secure erase of all data on disk 1.2, whose status is `AVAIL`.
	`# set disk 1.2 repurpose`
	In a system whose FDE security status is `Secured`, `Locked`, perform a secure erase of all data on disk 1.2, whose status is `UNUSABLE`.
	`# set disk 1.2 repurpose`
	`Disk 1.2 was used on another system, and its contents are unknown. The contents will be erased. Do you want to continue? (y/n)`

See also	set fde-lock-key set fde-state show disks (with the fde parameter) show fde-state

set disk-group

Description	Changes parameters for a specified disk group.
Minimum role	manage

Syntax	`set disk-group`
	`[adapt-spare-capacity` *`size`* `[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default]`
	`[name` *`new-name`*`]`
	`[owner a|b]`
	`[spin-down-delay delay]`
	`disk-group`

Parameters	`[adapt-spare-capacity` *`size`* `[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default]`
	Optional. For an ADAPT disk group, this specifies the target spare capacity.
	• *`size`* [B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]: Sets the target spare capacity to a specific size. The unit is optional (B represents bytes). If no unit is specified, GiB will be used, regardless of the current base. Whichever unit is set, internally the value will be rounded down to the nearest GiB. If the value is set to 0, the absolute minimum spare space will be used. If this parameter is omitted, the default setting will be used.
	• `default`: Sets the target spare capacity to the sum of the two largest disks in the disk group, which is sufficient to fully recover fault tolerance after loss of any two disks in the group.
	`name` *`new-name`*
	Optional. A new name for the disk group. A name that includes a space must be enclosed in double quotes.
	`owner a|b`
	Optional for a linear disk group. Prohibited for a virtual disk group. Sets the new owner: controller A or B.
	CAUTION: Before changing the owning controller for a linear disk group, you must stop host I/O to its volumes. Volume mappings are not affected.
	NOTE: Changing ownership of a disk group while any volumes in the disk group are mapped to live hosts is not supported and may cause data loss or unavailability. All volumes in the disk group must be unmapped or attached hosts must be shut down before the ownership of a disk group is changed.
	`spin-down-delay delay`
	Optional for a linear disk group. Prohibited for a virtual disk group. Not applicable for ADAPT. For spinning disks in a linear disk group, this sets the period of inactivity after which the disks and dedicated spares will automatically spin down. Setting the delay to 1–360 minutes will enable spin down; setting the delay to 0 will disable spin down.
	NOTE: Drive spin down affects disk operations as follows:
	• Spun-down disks are not polled for SMART events.
	• Operations requiring access to disks may be delayed while the disks are spinning back up.
	`disk-group`
	Name or serial number of the disk group to change. A name that includes a space must be enclosed in double quotes.

Examples	Rename virtual disk group `dgA01` to `vdg`.
	`# set disk-group name vdg dgA01`
	Rename linear disk group `dg1` to `dg2` and set its spin-down delay to 10 minutes.
	`# set disk-group name dg2 spin-down-delay 10 dg1`

See also	show disk-groups

set disk-parameters

Description	Sets parameters that affect disk operation. Two features controlled by these parameters are disk Self-Monitoring Analysis and Reporting Technology (SMART) and drive spin down. • Disks equipped with SMART technology can alert the controller of impending disk failure. When SMART is enabled, the system checks for SMART events one minute after a restart and every five minutes thereafter. SMART events are recorded in the event log. Changes to the SMART setting take effect after a rescan or a controller restart. • For spinning disks, the drive spin down feature monitors disk activity within system enclosures and spins down inactive disks, based on user-specified settings. This command sets spin-down parameters for available disks and global spares. Spin-down settings do not affect leftover disks. To set spin-down parameters for a linear disk group, use the set vdisk command.
Minimum role	manage

Syntax	`set disk-parameters`
	`[smart enabled|disabled|on|off|detect-only]`
	`[spin-down enabled|disabled|on|off]`
	`[spin-down-delay delay]`

Parameters	`smart enabled|disabled|on|off|detect-only`
	Optional. Sets whether SMART is enabled or disabled for disks:
	• `disabled` or `off`: Disables SMART for all disks in the system and for all disks added to the system.
	• `enabled` or `on`: Enables SMART for all disks in the system and for all disks added to the system. This is the default.
	• `detect-only`: Detects but does not change the SMART setting of each disk in the system, and for each new disk added to the system.
	`spin-down enabled|disabled|on|off`
	Optional. Sets whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the spin-down-delay parameter.
	• `disabled` or `off`: Drive spin down for available disks and global spares is disabled. This is the default. Disabling spin down will set the spin-down delay to 0.
	• `enabled` or `on`: Drive spin down for available disks and global spares is enabled. If the spin-down-delay parameter is not specified, the delay will be set to 60 minutes
	NOTE: Drive spin down is not applicable to ADAPT disk groups or virtual pools.
	`spin-down-delay delay`
	Optional. Sets the period of inactivity after which spinning disks that are available or are global spares will spin down. Setting the delay to 1–360 minutes will enable spin down. Setting the delay to 0 will disable spin down. The default is 15 minutes.

Examples	Enable SMART and drive spin down, and set the spin-down delay to 10 minutes. `# set disk-parameters smart on spin-down on spin-down-delay 10`
See also	show disk-parameters

set dns-management-hostname

Description	Sets a domain host name for each controller module to identify it for management purposes. The controller will advertise the management host name to DNS servers. The DNS servers will in turn create and advertise a fully qualified domain name (FQDN) for the controller by appending the management host name to the DNS domain string that identifies the controller.
Minimum role	manage

Syntax	`set dns-management-hostname`
	`[controller a|b]`
	`[name hostname]`

Parameters	`controller a|b`
	Optional. Specifies whether to change controller A or B, only. If this parameter is omitted, changes affect the controller being accessed.
	`name hostname`
	A host name to use for a controller.
	● The name must differ for each controller.
	● A name can have from 1 to 63 bytes.
	● The value is case sensitive.
	● A name must start with a letter and end with a letter or number.
	● A name can include letters, numbers, or hyphens; no periods.

Examples	Set the domain host name for controller A. `# set dns-management-hostname controller a name vlan3-ctlra`
See also	clear dns-parameters reset dns-management-hostname set dns-parameters show dns-management-hostname show dns-parameters

set dns-parameters

Description	Configures settings to resolve domain names using the Domain Name Service (DNS). Configuring the storage system to communicate with a DNS server within your network will allow network changes, such as frequent IP address changes in a DHCP environment, to occur without interrupting notifications sent by the system to users. After a reachable DNS server is configured on the system, or if DHCP is enabled and a DHCP server is reachable, a DNS server may be automatically acquired. Otherwise, you can configure an SMTP server using a name such as mysmtpserver.example.com. Further, you could configure search domain example.com and SMTP server mysmtpserver and reach the same destination. You must use this command to configure DNS parameters before you configure email parameters in any environments where DNS will be required to resolve server names. The priority of DNS servers and search domains is: ● User-supplied, using this command ● DHCPv6 ● DHCPv4
Minimum role	manage

Syntax	`set dns-parameters`
	`[controller a|b|both]`
	`nameservers nameserver-IP-list`
	`[search-domains domain-name-list]`

Parameters	`controller a|b|both]` Optional. Specifies whether to change controller A, B, or both. If this parameter is omitted, changes affect the controller being accessed.

	`nameservers nameserver-IP-list`
	An ordered list of name server addresses that are recognized within your network to be queried by the DNS resolver. You can specify a comma-separated list containing from one to three IPv4 or IPv6 addresses. The resolver will query the network in the order prescribed by the list until reaching a valid destination address. Any valid setting is treated as enabling DNS resolution for the system.
	`search-domains domain-name-list`
	Optional. An ordered list of domain names to search when resolving host names that are configured in the storage system. You can specify a comma-separated list containing from one to three domain names, with a maximum of 255 characters per domain name. The resolver will query the network in the order prescribed by the list until finding a match.

Examples	Configure the system to query the name server at IP address `8.8.8.8`, or at `8.8.6.6` if `8.8.8.8` is unsuccessful or unreachable, to resolve any SMTP server name with a domain of gmail.com, followed by *`google.com`*, and finally by *`yahoo.com`*. `# set dns-parameters nameservers 8.8.8.8,8.8.6.6 search-domains gmail.com,google.com,yahoo.com`
Basetypes	controller-dns-parameters status
See also	clear dns-parameters set dns-managment-hostname reset dns-management-hostname show dns-management-hostname show dns-parameters

set email-parameters

Description	Sets SMTP notification parameters for events and managed logs.
Minimum role	manage

Syntax	`set email-parameters`
	`domain domain`
	`email-list email-addresses`
	`[include-logs enabled|disabled|on|off]`
	`notification-level crit|error|warn|resolved|info|none`
	`[port port-number]`
	`security-protocol tls|ssl|none`
	`[sender sender]`
	`[sender-password password]`
	`server address`

Parameters	`domain domain`
	The domain name that is joined with an @ symbol to the sender name to form the “from” address for remote notification. The domain name can have a maximum of 255 bytes. The value cannot include a space or \ " , : ; < > ( ) For example:
	`MyDomain.com`
	If the domain name is not valid, some email servers will not process the mail.
	`email-list email-addresses`

	Enter from one to four comma-separated email addresses for recipients of event notifications. Each email address must use the format *user-name@domain-name* and can have a maximum of 320 bytes. The first three email addresses are used as destinations for events.
	
	If the managed logs feature is enabled, you can set the fourth email-address to the address of the log collection system. For example: `IT-team@MyDomain.com,,,LogCollector@MyDomain.com`
	
	`[include-logs disabled|on|off]`
	
	Optional. When the managed logs feature is enabled, this option activates the "push" mode, automatically attaching system log files to managed-logs email notifications that are sent to the log collection system. This option is disabled by default.
	
	`notification-level crit|error|warn|resolved|info|none`
	
	The minimum severity for which the system should send notifications:
	● `crit`: Sends notifications for Critical events only.
	● `error`: Sends notifications for Error and Critical events.
	● `warn`: Sends notifications for Warning, Error, and Critical events.
	● `resolved`: Sends notifications for Resolved, Warning, Error, and Critical events.
	● `info`: Sends notifications for all events.
	● `none`: Disables email notification. This is the default. If this option is specified, no other parameters are required and their current values are not changed.
	
	`[port` *`port-number`*`]`
	
	Optional. The port number to use for communication with the SMTP server. Configure this parameter only if you want to override use of standard SMTP network port 25.
	
	`security-protocol tls|ssl|none`
	
	Specifies whether to use a security protocol when communicating with the SMTP server.
	● `tls`: Enables Transport Layer Security (TLS) authentication. The standard ports for TLS are 25 or 587.
	● `ssl`: Enables Secure Sockets Layer (SSL) authentication. The standard port for SSL is 465.
	● `none`: Do not use a security protocol. The standard port is 25. This setting is the system default.
	
	`[sender` *`sender`*`]`
	
	Optional, unless `security-protocol` is set to `tls` or `ssl`.
	
	The sender name that is joined with an @ symbol to the domain name to form the "from" address for remote notification. This name provides a way to identify the system that is sending the notification. The sender name can have a maximum of 64 bytes. The value cannot include a space or: \ " , : ; < > ( ) [ ] @. For example: `Storage-1`.
	
	When a secure protocol is used, this sender name must correspond to the password specified by the `sender-password` parameter, and be a valid user on the configured SMTP server.
	
	If this parameter is omitted, the system name is used as the sender name.
	
	`[sender-password` *`password`*`]`
	
	Optional. This parameter is required for a secure SMTP server (using TLS or SSL) and must correspond to the user name specified by the `sender` parameter. The sender password can have a maximum of 32 bytes. The value can only include alphanumeric characters and these symbols: ^ _ + : , . @
	
	This parameter is not applicable if the `security-protocol` parameter is set to `none`. If the `security-protocol` parameter is set to `tls` or `ssl` and this parameter is omitted, the command prompts you to enter and re-enter a value, which is displayed obscured for security reasons.
	
	The network address of the SMTP mail server to use for the email messages. The value can be an IPv4 address, IPv6 address, or FQDN. If DNS is configured, this parameter may specify a server name. The value can have a maximum of 255 bytes.

Examples	For a server that requires TLS authentication through standard port 587 for SMTP notifications, set the system to do the following: ● Send an email from *RAIDsystem@mydomain.com* to both *sysadmin@mydomain.com* and *JSmith@domain2.com* when a non-Informational event occurs.

	• Send an email with attached logs to *logcollector@mydomain.com* when logs need to be transferred. `# set email-parameters server 10.1.9.10 sender RAIDsystem security-protocol tls port 587 sender-password Abcd%1234 domain mydomain.com notification-level warn include-logs enabled email-list sysadmin@mydomain.com,JSmith@domain2.com,,logcollector@mydomain.com`
See also	set dns-parameters show dns-parameters show email-parameters test (with the email parameter)

set enclosure

Description	Sets an enclosure's name, location, rack number, and rack position. Set these parameters to values that help you identify and locate the enclosure. These values are used when user interfaces show enclosure-related data, such as in output of the show enclosures command and in event-log entries related to enclosures
Minimum role	manage

Syntax	`set enclosure`
	`[name new-name]`
	`[location location]`
	`[rack-number rack-number]`
	`[rack-position rack-position]`
	`enclosure-number`

Parameters	`[name new-name]`
	Optional. A new name for the enclosure. Input rules:
	• The value is case sensitive.
	• The value can have a maximum of 20 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , . < \
	• A value that includes a space must be enclosed in double quotes.
	`[location location]`
	The location of the enclosure. Input rules:
	• The value is case sensitive.
	• The value can have a maximum of 20 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , . < \
	• A value that includes a space must be enclosed in double quotes.
	`[rack-number rack-number]`
	The number of the rack containing the enclosure, from 0 to 255.
	`[rack-position rack-position]`
	The enclosure's position in the rack, from 0 to 255.
	`enclosure-number`
	The enclosure ID.

Examples	Set parameters for enclosure 1. `# set enclosure 1 name Storage-5 location Lab rack-number 9 rack-position 3`
See also	show enclosures

set expander-fault-isolation

Description	Temporarily disables PHY fault isolation for a specific Expander Controller. **NOTE:** This command is for use by or with direction from technical support By default, the Expander Controller in each I/O module performs fault-isolation analysis of SAS expander PHY statistics. When one or more error counters for a specific PHY exceed the built-in thresholds, the PHY is disabled to maintain storage system operation. While troubleshooting a storage system problem, a service technician can use this command to temporarily disable fault isolation for a specific Expander Controller in a specific enclosure. **NOTE:** If fault isolation is disabled, be sure to re-enable it before placing the system back into service. Serious problems can result if fault isolation is disabled and a PHY failure occurs.
Minimum role	manage

Syntax	`set expander-fault-isolation`
	`[controller a|b|both]`
	`enabled|disabled|on|off`
	`[encl enclosure-ID]`
	`[wwn enclosure-wwn]`

Parameters	`[controller a|b|both]`
	Optional. The I/O module containing the Expander Controller whose setting you want to change: A, B, or both. If this parameter is omitted, the setting is changed in both I/O modules.
	`enabled|disabled|on|off`
	Specifies whether to enable or disable PHY fault isolation.
	`[encl enclosure-ID]`
	Optional. The enclosure ID of the enclosure containing the PHY. Specify either this parameter or the wwn parameter.
	`[wwn enclosure-wwn]`
	Optional. The WWN of the enclosure containing the PHY. Specify either this parameter or the encl parameter.

Examples	Disable PHY fault isolation for Expander Controller A in enclosure 1.
	`# set expander-fault-isolation encl 1 controller a disabled`
	Re-enable PHY fault isolation for Expander Controller A in enclosure 1.
	`# set expander-fault-isolation encl 1 controller a enabled`

See also	show enclosures show expander-status

set fde-import-key

Description	Sets or changes the import lock key for the use of Full Disk Encryption. The import lock key is derived from the passphrase and is used to unlock secured disks that are inserted into the system from a different secure system.
Minimum role	manage
Syntax	`set fde-import-key` `[noprompt]`

	`passphrase value`

Parameters	`[noprompt]`
	Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.
	`passphrase value`
	A customer-supplied password associated with securing the system. Input rules:
	• The value is case sensitive.
	• The value can have 8–32 characters.
	• The value can include printable UTF-8 characters except: , < > \
	(Any double-quote characters in the passphrase are automatically removed.)

Examples	Set an import lock key in order to import locked disks from another secure system:
	`# set fde-import-key passphrase "Customer lock--01/10/2014"`
	`Please re-enter the import passphrase to confirm: "Customer lock--01/10/2014"`

See also	clear fde-keys set fde-lock-key set fde-state show fde-state

set fde-lock-key

Description	Sets or changes the lock key for the use of Full Disk Encryption. The lock key is derived from the passphrase and stored within the system. You must retain the value of the passphrase and the lock key ID that the command returns. If you lose the passphrase, you could be locked out of your data. When a system and its disks are in the Secured, Locked state, you must enter the passphrase for the system's lock key ID to restore access to data. Disk groups will be dequarantined, pool health will be restored, and volumes will become accessible. You cannot set the lock key if any disks are failed, leftover, or unusable. Use the `show pools` command to check whether any disks have Usage value FAILED, LEFTOVR, or UNUSABLE. If any such disks are present, resolve the disk issues.
Minimum role	manage

Syntax	`set fde-lock-key`
	`[current-passphrase value]`
	`[noprompt]`
	`passphrase value`

Parameters	`[current-passphrase value]`
	Optional. If the system is secured, the current passphrase can be provided when using the noprompt option. The command will prompt for this current passphrase if it is not supplied.
	`[noprompt]`
	Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.
	`passphrase value`
	A customer-supplied password associated with securing the system. Input rules:

	• The value is case sensitive. • The value can have 8–32 characters. • The value can include printable UTF-8 characters except: , < > \ (Any double-quote characters in the passphrase are automatically removed.)
Examples	Set a lock key in preparation for securing the system using FDE. `# set fde-lock-key passphrase "Customer lock--01/10/2014"`
See also	clear fde-keys set fde-lock-key set fde-state show fde-state

set fde-state

Description	Changes the overall state of the system for the use of Full Disk Encryption. The system can be secured, where each disk becomes secured and not accessible outside the system. Alternatively, the system can be repurposed, where each disk is secure erased.
Minimum role	manage

Syntax	`set fde-state`
	`[noprompt]`
	`[repurpose]`
	`[secure passphrase value]`
	Either the `repurpose` parameter or the `secure` parameter must be specified.

Parameters	`[noprompt]`
	Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.
	`[repurpose]`
	Optional. The system will be repurposed, which secure erases all disks. Before issuing the command, all data (such as volumes and disk groups) must be deleted from the disks
	`[secure passphrase value]`
	Optional. The system and all its disks will become secured, using the specified FDE system passphrase, which must have been previously configured. A value that includes a space must be enclosed in double quotes. If the disks are not all FDE-capable the command will fail, and no changes will be made.

Examples	Secure the system using Full Disk Encryption.
	`# set fde-state secure passphrase "Customer lock--01/10/2014"`
	`A lost passphrase will result in unrecoverable data loss. Please re-enter the passphrase to confirm: "Customer lock--01/10/2014"`

See also	clear fde-keys set fde-lock-key set fde-state show fde-state

set host

Description	Sets the name of a host and optionally the profile of the host and the initiators it contains.
Minimum role	manage

Syntax	`set host`
	`[name new-name]`
	`[profile standard]`
	`host-name`

Parameters	`[name new-name]`
	Optional. Changes the host's nickname to the specified name. Input rules:
	● The value is case sensitive.
	● The value can have a maximum of 32 bytes.
	● The value can include spaces and printable UTF-8 characters except: " , . < \
	● A value that includes a space must be enclosed in double quotes.
	`[profile standard]`
	Optional. Default profile.
	CAUTION: Changing this parameter can disrupt access from connected hosts.
	`host-name`
	The current name of the host. A value that includes a space must be enclosed in double quotes.

Examples	Change the name of `Host1` to `MyHost` and the profile to standard. `# set host name MyHost profile standard Host1`
See also	show initiators

set host-group

Description	Sets the name of a host group.
Minimum role	manage
Syntax	set host-group name *new-name* *host-group*
Parameters	name *new-name* A new name for the host group. Input rules: ● The value is case sensitive. ● The value can have a maximum of 26 bytes. ● The value can include spaces and printable UTF-8 characters except: " , . < \ ● A value that includes a space must be enclosed in double quotes. *host-group* The current name of the host group. A value that includes a space must be enclosed in double quotes.
Examples	Change the name of `HostGroup1` to `MyHostGroup`. `# set host-group name MyHostGroup HostGroup1`
See also	show host-groups

set host-parameters

Description	Sets controller host-port parameters for communication with attached hosts. Host ports can be configured as FC or iSCSI ports. FC ports support use of qualified 16-Gbit/s SFPs. You can set FC ports to auto-negotiate the link speed or to use a specific link speed. iSCSI ports support use of qualified 10-Gbit/s SFPs. iSCSI port speeds are auto-negotiated. 10GbE iSCSI host ports support use of qualified Direct Attach Copper (DAC) cables. iSCSI port speeds are auto-negotiated. **CAUTION: Parameter changes will immediately take effect and may affect access to data. The exception is that attempting to change FC loop IDs requires restarting the controllers.**
Minimum role	manage

Syntax	To set FC port parameters:
	`set host-parameters`
	`[controller a|b|both]`
	`[fibre-connection-mode loop|point-to-point|auto]`
	`[fibre-loop-id` *`values`*`]`
	`[noprompt]`
	`[ports` *`ports`*`|all]`
	`[prompt yes|no|expert]`
	[speed 4g|8g|16g|auto]
	To set iSCSI port parameters:
	`set host-parameters`
	`[controller a|b|both]`
	`[default-router` *`address`*`]`
	`[gateway` *`address`*`]`
	`[ip` *`address`*`]`
	`[iscsi-ip-version ipv4|ipv6]`
	`[netmask` *`address`*`]`
	`[noprompt]`
	`[ports` *`ports`*`|all]`
	`[prompt yes|no|expert]`

Parameters	`[controller a|b|both]`
	Deprecated—use the ports parameter instead
	`[fibre-connection-mode loop|point-to-point|auto]`
	Optional. For FC, sets the topology for the specified ports to:
	● `loop`: Fibre Channel-Arbitrated Loop (public or private). Loop mode cannot be used with 16-Gbit/s link speed.
	● `point-to-point`: Fibre Channel point-to-point. This is the default.
	● `auto`: Automatically sets the mode based on the detected connection type
	You must also specify the `ports` parameter.
	`[fibre-loop-id` *`values`*`]`
	Optional. For FC, specifies comma-separated loop ID values to request for host ports when controllers arbitrate during a LIP. Use this option if you want ports to have specific addresses, if your system checks addresses in reverse order (lowest address first), or if an application requires

	that specific IDs be assigned to recognize the controller. If the loop ID is changed for one port, the same ID is used for other ports in the same controller. If the ports parameter is specified, loop IDs are set based on the controllers that the ports are in. You cannot specify the same value for ports on different controllers.
	• `soft` or `255`: Soft target addressing enables the LIP to determine the loop ID. Use this setting if the loop ID is permitted to change after a LIP or power cycle.
	• `0–125`: Specify a hard target address if you do not want the loop ID to change after a LIP or power cycle. If the port cannot acquire the specified ID, it is assigned a soft target address
	You must restart affected controllers to make loop ID changes take effect.
	`[default-router address]`
	Optional. For iSCSI IPv6 only, the default router for the port IP address. This parameter requires the `ports` parameter.
	`[gateway address]`
	Optional. For iSCSI, the port gateway address. This parameter requires the `ports` parameter.
	`[ip address]`
	Optional. For iSCSI, the port IP address. Ensure that each iSCSI host port in the storage system is assigned a different IP address. This parameter requires the `ports` parameter.
	`[iscsi-ip-version ipv4|ipv6]`
	Optional. Specifies whether to use IP version 4 (IPv4) or 6 (IPv6) for addressing controller iSCSI ports. When you change this setting, iSCSI-port address values are converted to the new format:
	• `ipv4`: Lets you specify addresses in dot-decimal format, where the four octets of the address use decimal values without leading zeroes and the octets are separated by a period. For example, 10.132.2.205. The first octet may not be zero, with the exception that 0.0.0.0 can be used to disable the interface (stop I/O). This option is the default.
	• `ipv6`: Lets you specify addresses using eight groups of four hexadecimal digits, where the groups are separated by a colon. All groups must be specified. For example, 0000:0000:0000:0000:0000:0000:0A90:3442
	`[netmask address]`
	Optional. For iSCSI IPv4 only, the subnet mask for the port IP address. This parameter requires the `ports` parameter.
	`[noprompt]`
	Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.
	`[ports ports|all]`
	Optional. Specific host port numbers or all ports. For port syntax, see Command syntax
	`[prompt yes|no|expert]`
	Optional. For scripting, this specifies an automatic reply to confirmation prompts:
	• `yes`: Allow the command to proceed.
	• `no`: Cancel the command.
	• `expert`: Allow the command to proceed
	If this parameter is omitted, you must manually reply to prompts
	`speed 4g|8g|16g|auto`
	Optional. For FC, sets a forced link speed in Gbit/s or lets the speed be auto-negotiated (auto). Because a speed mismatch prevents communication between the port and host, set a speed only if you need to force the port to use a known speed for testing, or you need to specify a mutually supported speed for more than two FC devices connected in an arbitrated loop. Loop mode cannot be used with 16-Gbit/s link speed. This parameter requires the ports parameter.

Examples	On a system with FC ports, set the link speed to 8 Gbit/s for ports A1 and B1. `# set host-parameters speed 8g ports a1,b1` On a system with FC ports, set the link speed to auto for ports A1 and B1 and suppress the confirmation prompt.

	`# set host-parameters speed auto ports a1,b1 noprompt`
	On a system with iSCSI ports using IPv4 addressing, change the IP address of port A3.
	`# set host-parameters ip 10.134.50.6 ports a3`
	On a system with iSCSI ports, specify to use IPv6 addressing and change the IP address and default router for port A1.
	`# set host-parameters ports A1 iscsi-ip-version ipv6 ip ::8576:246a default-router ::0a0a:`

See also	restart mc restart sc set host-port-mode set iscsi-parameters show ports

set host-port-mode

Description	Changes host-interface characteristics for host ports in a CNC controller module. For both controller modules, all ports can be set to FC, all ports can be set to iSCSI, or the first two ports in each controller module can be set to FC and the second two ports can be set to iSCSI. This command will immediately change the host port configuration, stop I/O, restart both controllers, and log event 236. After the controllers have restarted, you can use the set host-parameters command to configure the individual ports. **NOTE:** If you change the configuration of host ports used for replication peer connections, you will have to reconfigure the peer connections.
Minimum role	manage

Syntax	`set host-port-mode`
	`[FC|iSCSI|FC-and-iSCSI]`
	`[noprompt]`

Parameters	`[FC|iSCSI|FC-and-iSCSI]`
	Sets the port mode for each controller.
	• `FC`: Sets all ports to FC.
	• `iSCSI`: Sets all ports to iSCSI.
	• `FC-and-iSCSI`: Sets the first two ports to FC and the second two ports to iSCSI.
	`[noprompt]`
	Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

Examples	For both controllers, set all ports to use iSCSI protocol.
	`# set host-port-mode iSCSI`
	For both controllers, set the first two ports to use FC protocol and the second two ports to use iSCSI protocol.
	`# set host-port-mode FC-and-iSCSI`

See also	set host-parameters show ports

set initiator

Description	Sets the name of an initiator and optionally its profile.
Minimum role	manage

Syntax	`set initiator`
	`id initiator`
	`[nickname` *`name`*`]`
	`[profile standard]`

Parameters	*`id initiator`*
	The ID of the initiator.For FC, the ID is a WWPN.
	For SAS, the ID is a WWPN. For iSCSI, the ID is an IQN. A WWPN can include a colon between each byte but the colons will be discarded.
	`[nickname` *`name`*`]`
	Optional. Sets the name of the initiator to the specified name. Input rules:
	• The value is case sensitive.
	• The value can have a maximum of 32 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , . < \
	• A value that includes a space must be enclosed in double quotes.
	`[profile standard]`
	Optional. Default profile
	CAUTION: Changing this parameter can disrupt access from connected initiators.

Examples	For FC initiator 21000024ff3dfed1, set its name to `FC-port1` and profile to standard.
	`# set initiator id 21000024ff3dfed1 nickname FC-port1 profile standard`
	For SAS initiator 21000024ff3dfed1, set its name to `SAS-port1` and profile to standard.
	`# set initiator id 21000024ff3dfed1 nickname SAS-port1 profile standard`
	For iSCSI initiator iqn.1991-05.com.microsoft:myhost.domain, set its name to `iSCSI-port1` and profile to standard.
	`# set initiator id iqn.1991-05.com.microsoft:myhost.domain nickname iSCSI-port1 profile standard`

See also	show initiators

set ipv6-network-parameters

Description	Sets IPv6 parameters for the network port in each controller module.
Minimum role	manage

Syntax	`set ipv6-network-parameters`
	`[autoconfig enabled|disabled|on|off]`
	`[controller a|b|both]`
	`[gateway` *`gateway`*

Parameters	**NOTE:** At minimum, `autoconfig` or `gateway` must be specified. `[autoconfig enabled|disabled|on|off]`

	Optional. • `enabled` or `on`: Specifies whether to use an automated method (either DHCPv6 or SLAAC, as defined by the network configuration) to automatically configure the address. This provides a single IPv6 address. If a DHCPv6 address is available, DHCPv6 will provide the interface address. If DHCPv6 cannot provide an address, the SLAAC address will be the single interface address. This is the default. • `disabled` or `off`: Specifies whether to use manual mode. This mode uses static IPv6 addresses set with the add ipv6-address command. To use manual mode, at least one and up to four IPv6 addresses must already be set. **NOTE:** Enabling `autoconfig` will deactivate any static IPv6 addresses, which will no longer be reachable. The static IPv6 addresses will otherwise remain in the configuration, but will not be bound to any interface unless `autoconfig` is subsequently disabled. `[controller a|b|both]` Optional. Specifies whether to change controller A, B, or both. If this parameter is omitted, changes affect both controllers. `[gateway` *`gateway`* Optional. Specifies a gateway IP address for the port. The value must be a valid IPv6 address. The value cannot include a `prefix` or `/prefixLength` notation. The address cannot be used elsewhere in the network port configuration. All addresses share a single gateway.
Examples	For controller A, enable autoconfig and set the gateway address. # set ipv6-network-parameters autoconfig enabled controller a gateway 001:0db8:85a3:0000:0000:8a2e:0370:1111
See also	add ipv6-address remove ipv6-address show ipv6-addresses show ipv6-network-parameters

set iscsi-parameters

Description	Changes system-wide parameters for iSCSI host ports in each controller module. **CAUTION: Applying new parameters to the ports or modifying unused ports may cause hosts to lose access to the storage system.**
Minimum role	manage

Syntax	`set iscsi-parameters`
	`[chap enabled|disabled|on|off]`
	`[iscsi-ip-version ipv4|ipv6]`
	`[isns enabled|disabled|on|off]`
	`[isns-alt-ip` *`iSNS-IP`*`]`
	`[isns-ip` *`iSNS-IP`*`]`
	`[jumbo-frame enabled|disabled|on|off]`
	`[speed auto|1gbps]`

Parameters	`[chap enabled|disabled|on|off]` Optional. Enables or disables use of Challenge Handshake Authentication Protocol. Disabled by default.

	When CHAP is enabled and the storage system is the recipient of a login request from a known originator (initiator), the system will request a known secret. If the originator supplies the secret, the connection will be allowed
	`[iscsi-ip-version ipv4|ipv6]`
	Optional. Specifies whether to use IP version 4 (IPv4) or 6 (IPv6) for addressing controller iSCSI ports.
	• `ipv4`: Lets you specify addresses in dot-decimal format, where the four octets of the address use decimal values without leading zeroes and the octets are separated by a period. For example, 10.132.2.205. This option is the default.
	• `ipv6`: Lets you specify addresses using eight groups of four hexadecimal digits, where the groups are separated by a colon. All groups must be specified. For example, 0000:0000:0000:0000:0000:0000:0A90:3442.
	`[isns enabled|disabled|on|off]`
	Optional. Enables or disables registration with a specified Internet Storage Name Service server, which provides name-to-IP-address mapping. Disabled by default.
	`[isns-alt-ip iSNS-IP]`
	Optional. Specifies the IP address of an alternate iSNS server, which can be on a different subnet. The default address is all zeroes.
	`[isns-ip iSNS-IP]`
	Optional. Specifies the IP address of an iSNS server. The default address is all zeroes.
	`[jumbo-frame enabled|disabled|on|off]`
	Optional. Enables or disables support for jumbo frames. Allowing for 100 bytes of overhead, a normal frame can contain a 1400-byte payload whereas a jumbo frame can contain a maximum 8900-byte payload for larger data transfers. Use of jumbo frames can succeed only if jumbo-frame support is enabled on all network components in the data path.
	Disabled by default
	`[speed auto|1gbps]`
	Sets the host port link speed.
	• `auto`: Auto-negotiates the proper speed. This is the default.
	• `1gbs`: Forces the speed to 1 Gbit/s, overriding a downshift that can occur during auto-negotiation with 1-Gbit/s HBAs. This setting does not apply to 10-Gbit/s HBAs.

Examples	For a storage system using IPv4 addressing whose host ports are connected to different subnets, enable CHAP, specify the IP address of the iSNS server on each subnet, and enable registration with either server.
	`# set iscsi-parameters chap enabled isns enabled isns-ip 10.10.10.93 isns-alt-ip 10.11.10.90`
	Specify that iSCSI ports will use IPv6 addressing.
	`# set iscsi-parameters iscsi-ip-version ipv6`

See also	set host-parameters show iscsi-parameters

set led

Description	Turns a specified device's identification LED on or off to help you locate the device. For LED descriptions, see your product's installation or FRU documentation.
Minimum role	manage
Syntax	To set a disk LED: `set led`

	`disk ID`
	`enable|disable|on|off`
	To set the LEDs for an enclosure and its I/O modules:
	`set led`
	`[controller a|b]`
	`enable|disable|on|off`
	`enclosure ID`

Parameters	`[controller a|b]`
	Optional; for use with the enclosure parameter. Specifies the I/O module to locate. This affects the identification LED on the I/O module and on the enclosure.
	`disk ID`
	Specifies the disk to locate. For disk syntax, see Command syntax. This overrides the fault LED on the disk.
	`enable|disable|on|off`
	Specifies to turn the LED on or off.
	`enclosure ID`
	Specifies the enclosure to locate. This affects the identification LED on the enclosure and on each I/O module.

Examples	Identify disk 5 in enclosure 1.
	`# set led disk 1.5 on`
	Stop identifying enclosure 1.
	`# set led enclosure 1 off`
	Identify controller B in enclosure 1.
	`# set led enclosure 1 controller b on`

set network-parameters

Description	Sets parameters for the network port in each controller module. You can manually set static IPv4 or IPv6 values for a network port, or you can specify that IP values should be set automatically for a network port through communication with a Dynamic Host Configuration Protocol (DHCP) server. The addressing mode can be set differently on each controller. IPv4 and IPv6 can be used concurrently. This command can be used to configure use of IPv4. To configure use of IPv6, use the set ipv6-network-parameters command. Each controller has the following factory-default IP settings: ● DHCP: disabled ● Controller A IP address: 10.0.0.2 ● Controller B IP address: 10.0.0.3 ● IP subnet mask: 255.255.255.0 ● Gateway IP address: 10.0.0.1 When DHCP is enabled, the following initial values are set and remain set until the system is able to contact a DHCP server for new addresses. ● Controller IP addresses: 169.254.x.x (where the value of *x.x* is the lowest 16 bits of the controller serial number) ● IP subnet mask: 255.255.0.0 ● Gateway IP address: 0.0.0.0

	169.254.x.x addresses (including gateway 169.254.0.1) are on a private subnet that is reserved for unconfigured systems and the addresses are not routable. This prevents the DHCP server from reassigning the addresses and possibly causing a conflict where two controllers have the same IP address. As soon as possible, change these IP values to proper values for your network To switch a controller from DHCP addressing to static addressing, you must set the IP address, netmask, and gateway values. **NOTE:** The following IP addresses are reserved for internal use by the storage system: 169.254.255.1, 169.254.255.2, 169.254.255.3, 169.254.255.4, and 127.0.0.1. Because these addresses are routable, do not use them anywhere in your network.
Minimum role	manage

Syntax	`set network-parameters`
	`[controller a|b|both]`
	`[dhcp]`
	`[gateway gateway]`
	`[ip address]`
	`[netmask netmask]`
	`[ping-broadcast enabled|disabled|on|off]`

Parameters	`[controller a|b|both]`
	Optional. For IP-related parameters, this specifies whether to change controller A, B, or both. If this parameter is omitted and both controllers are set to use DHCP or are set to use ping-broadcast, changes affect both controllers. Otherwise, if this parameter is omitted and the ip parameter, netmask parameter, or gateway parameter is set, changes affect the controller being accessed.
	`[dhcp]`
	Optional. Specifies to use DHCP to set network-port IP values for both controllers, unless one controller is specified by using the controller parameter.
	`[gateway gateway]`
	Optional. A gateway IP address for the port.
	`[ip address]`
	Optional. An IP address for the port. Specify the address in dot-decimal format, where the four octets of the address use decimal values and the octets are separated by a period; for example, 10.132.2.205. The first octet may not be zero, with the exception that 0.0.0.0 can be used to disable the interface (stop I/O). This is the default.
	`[netmask netmask]`
	Optional. An IP subnet mask for the port.
	`[ping-broadcast enabled|disabled|on|off]`
	Optional. Enables the storage system to respond when a ping to a broadcast address is issued on the system subnet. This is disabled by default.

Examples	Manually set network-port IP values for each controller (disabling DHCP for both controllers, if it was enabled) using IPv4 addressing. Then enable DHCP for controller A without affecting controller B.
	`# set network-parameters ip 192.168.0.10 netmask 255.255.255.0 gateway 192.168.0.1 controller a`
	`# set network-parameters ip 192.168.0.11 netmask 255.255.255.0 gateway 192.168.0.1 controller b`
	`# set network-parameters dhcp controller a`

See also	show network-parameters

set ntp-parameters

Description	Sets Network Time Protocol (NTP) parameters for the system. You can manually set system date and time parameters by using the set controller-date command. You must specify at least one of the optional parameters for the command to succeed. **NOTE:** If you change the time zone of the secondary system in a replication set whose primary and secondary systems are in different time zones, you must restart the system to enable management interfaces to show proper time values for replication operations.
Minimum role	manage

Syntax	`set ntp-parameters`
	`[ntp enabled|disabled|on|off]`
	`[ntpaddress address]`
	`[timezone +|-hh[:mm]]`

Parameters	`[ntp enabled|disabled|on|off]`
	Optional. Enables or disables use of NTP. When NTP is enabled and the specified NTP server is available, each controller's time is synchronized with the server. This is disabled by default.
	`[ntpaddress address]`
	Optional. The network address of an available NTP server. The value can be an IPv4 address, IPv6 address, or FQDN.
	`[timezone +|-hh[:mm]]`
	Optional. The system's time zone as an offset in hours (-12 through +14) and optionally minutes (00–59) from Coordinated Universal Time (UTC). To specify a positive offset, the '+' is optional. To specify a negative offset, the '-' is required. The hour value can have one or two digits and can omit a leading zero. If the minutes value is specified it must have two digits. If it is omitted, the minutes value is set to 00.

Examples	Set the system to use NTP with an offset for the Mountain Time zone.
	`# set ntp-parameters ntp enabled ntpaddress 69.10.36.3 timezone -7`
	Set the system to use NTP with an offset for the Bangalore, India, time zone.
	`# set ntp-parameters ntp enabled ntpaddress 69.10.36.3 timezone +5:30`

See also	set controller-date show controller-date show ntp-status

set password

Description	Sets a user password for system interfaces, such as the CLI. A password can be entered as part of the command, or the command prompts you to enter and re-enter the new password.
Minimum role	manage

Syntax	`set password`
	`[password password]`
	`[user]`

Parameters	`[password password]` Optional. Sets a new password for the user. Input rules: • The value is case sensitive.

	• The value can have 8-32 characters. • The value can include spaces and printable UTF-8 characters except: " , . < \ • A value that includes only printable ASCII characters must include at least one uppercase character, one lowercase character, one numeric character, and one non-alphanumeric character. If this parameter is omitted, the command prompts you to enter and re-enter a value, which is displayed obscured for security reasons. For an SNMPv3 user whose authentication-type parameter is set to use authentication, this specifies the authentication password. The password can have a maximum of 32 bytes and contain only alphanumeric characters and ^ _ + : , . @. `[user]` Optional. The user name for which to set the password. If this parameter is omitted, this command affects the logged-in user's password.

Examples	Change the password for a user named LabAdmin.
	`# set password LabAdmin`
	`Enter new password: ********`
	`Re-enter new password: ********`
	Change the password for a user named JDoe.
	`# set password JDoe password Abcd%1234`

See also	show users

set peer-connection

Description	Modifies a peer connection between two systems. You can use this command to change the name of a current peer connection or to change the port address of the remote system without changing the peer connection configurations. For example, you could configure a peer connection and then move one of the peers to a different network. You can run this command on either the local system or the remote system. You must specify the username and password of a user with the manage role on the remote system. Changing the peer connection name will not affect the network connection so any running replications will not be interrupted. Changing the remote port address will modify the network connection, which is permitted only if there are no active replications using the connection. Abort all replications before modifying the peer connection. Additionally, either suspend the replication set to prevent any scheduled replications from running during the operation, or make sure the network connection is offline. After you have modified the peer connection, you can resume the replication set.
Minimum role	manage

Syntax	`set peer-connection`
	`[name new-name]`
	`[remote-password password]`
	`[remote-port-address remote-port-address]`
	`remote-username username`
	`peer-connection-ID`

Parameters	`[name new-name]` Optional. A new name for the peer connection. If you specify this parameter you may not specify the remote-port-address parameter. Input rules: • The value is case sensitive.

	• The value can have a maximum of 32 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , . < \
	• A value that includes a space must be enclosed in double quotes.
	`[remote-password password]`
	Optional in console format; required for API format. The password of the user specified by the remote-username parameter. If this parameter is omitted, the command prompts you to enter and re-enter a value, which is displayed obscured for security reasons.
	`[remote-port-address remote-port-address]`
	Optional. Specifies a new FC WWN or iSCSI IP address for the remote system. IPv4 and IPv6 formats are supported. If you specify this parameter you may not specify the name parameter.
	`remote-username username`
	The name of a user in the remote system. This must be a user with the manage role to remotely configure or provision that system.
	peer-connection-ID
	Specifies the name or serial number of the peer connection to modify.

Examples	Connect the current peer connection `Peer1` to the remote system's new IP address, `192.168.202.22`, using the credentials of remote user `John`.
	`# set peer-connection remote-port-address 192.168.202.22 remote-username John remote-password John1234 Peer1`
	Rename `Peer1` to `PeerCon1`.
	`# set peer-connection name PeerCon1 remote-username John remote-password John1234 Peer1`

See also	create peer-connection delete peer-connection query peer-connection show peer-connection

set pool

Description	Sets parameters for a virtual pool. Each virtual pool has three thresholds for page allocation as a percentage of pool capacity. You can set the low and middle thresholds. The high threshold is automatically calculated based on the available capacity of the pool minus 200 GB of reserved space. When the low or middle threshold is exceeded, event 462 is logged with Informational severity. If the high threshold is exceeded and the pool is not overcommitted, event 462 is logged with Informational severity. If the high threshold is exceeded and the pool is overcommitted, event 462 is logged with Warning severity. If the pool capacity threshold is reached, event 462 is logged with Error severity. When pool usage falls back below any threshold, event 463 is logged with Informational severity. **NOTE:** If the pool size is small (approximately 500 GB) and/or the middle threshold is relatively high, the high threshold may not guarantee 200 GB of reserved space in the pool. The controller will not automatically adjust the low and middle thresholds in such cases. You can also enable the overcommit feature, which controls whether storage-pool capacity may exceed the physical capacity of disks in the system. If you try to disable overcommit and the total space allocated to thin-provisioned volumes exceeds the physical capacity of their pool, an error will state that there is insufficient free disk space to complete the operation and overcommit will remain enabled. • When the overcommit feature is disabled, the host does not lose read or write access to the pool volumes when the pool reaches or exceeds the high threshold value.

	• When the overcommit feature is enabled, the storage system sends the data protect sense key `Add, Sense: Space allocation failed write protect` to the host when the pool reaches or exceeds the high threshold value. If the host is rebooted after the pool reaches or exceeds the high threshold value, the host loses read and write access to the pool volumes. The only way to regain read and write access to the pool volumes is to add more storage to the pool. If your system has a replication set, the pool might be unexpectedly overcommitted because of the size of the internal snapshots of the replication set. To check if the pool is overcommitted, view the over-committed and over-committed-numeric properties shown by the `show pools` command in API mode. You can also view the Pool Overcommitted value in the PowerVault Manager, as described in help for the Pools topic.
Minimum role	manage

Syntax	`set pool`
	`[low-threshold #%]`
	`[middle-threshold #%]`
	`[overcommit enabled|disabled|on|off]`
	`pool`

Parameters	`[low-threshold #%]`
	Optional. Sets the low threshold for page allocation as a percentage of pool capacity. This value must be less than the middle-threshold value. The default low-threshold value is 50%.
	`[middle-threshold #%]`
	Optional. Sets the middle threshold for page allocation as a percentage of pool capacity. This value must be between the low-threshold value and the high-threshold value. The default middle-threshold value is 75%.
	`[overcommit enabled|disabled|on|off]` Optional.
	• `enabled` or `on`: The allocated size of the volumes can exceed the physical capacity of the pool. When stored data approaches the limit of physical capacity, the administrator can add more enclosures to the system. This is the default.
	• `disabled` or `off`: The allocated size of the volumes cannot exceed the physical capacity of the pool.
	NOTE: If you try to disable overcommit and the total space allocated to thin-provisioned volumes exceeds the physical capacity of their pool, an error will say that there is insufficient free disk space to complete the operation and overcommit will remain enabled.
	`pool`
	The name of the storage pool for which to change settings.

Examples	For pool A, set the low threshold to 30%.
	`# set pool low-threshold 30% A`
	For pool B, disable overcommit.
	`# set pool overcommit off B`

See also	delete pools show pools

set prompt

Description	Sets the prompt for the current CLI session. This setting does not persist beyond the current session.
Minimum role	manage
Syntax	`set prompt`

	prompt
Parameters	*prompt* The new prompt. Input rules: ● The value is case sensitive. ● The value can have a maximum of 16 characters. ● The value can include spaces and printable UTF-8 characters except: " , . < \ ● A value that includes a space must be enclosed in double quotes.

Examples	Change the prompt from "# " to "CLI$ " and start entering a show command.
	`# set prompt "CLI$ "`
	`Success: Command completed successfully. (2014-07-17 16:44:25)`
	`CLI$ show ...`

set protocols

Description	Enables or disables management services and protocols. In console format, if you enable an unsecured protocol the command will prompt for confirmation.
Minimum role	manage
Syntax	set protocols [activity enabled|disabled|on|off] [debug enabled|disabled|on|off] [ftp enabled|disabled|on|off] [http enabled|disabled|on|off] [https enabled|disabled|on|off] [management-mode v2|v3|linear|virtual] [ses enabled|disabled|on|off] [sftp enabled|disabled|on|off] [sftp-port *port*] [slp enabled|disabled|on|off] [smis enabled|disabled|on|off] [snmp enabled|disabled|on|off] [ssh enabled|disabled|on|off] [ssh-port *port*] [telnet enabled|disabled|on|off] [usmis enabled|disabled|on|off]

Parameters	`[activity enabled|disabled|on|off]`
	Optional. Enables or disables access to the activity progress interface via HTTP port 8081. This mechanism reports whether a firmware update or partner firmware update operation is active and shows the progress through each step of the operation. In addition, when the update operation completes, status is presented indicating either the successful completion, or an error indication if the operation failed. This is disabled by default.
	`[debug enabled|disabled|on|off]`
	Optional. Enables or disables debug capabilities, including Telnet debug ports and privileged diagnostic user IDs. This is disabled by default.

NOTE: Properly shut down the debug console by using the set protocols debug disable command. Do not just close the console directly or by using the exit command.

`[ftp enabled|disabled|on|off]`

Optional. Enables or disables File Transfer Protocol (FTP), a secondary interface for installing firmware updates, installing security certificates and keys and downloading logs. This is disabled by default.

`[http enabled|disabled|on|off]`

Optional. Enables or disables the standard PowerVault Manager web server. This is disabled by default.

`[https enabled|disabled|on|off]`

Optional. Enables or disables the secure PowerVault Manager web server. This is enabled by default.

`[management-mode v2|v3|linear|virtual]`

Optional. Sets the default management mode for the system.

- `v2` or `linear`: Uses linear-storage terminology in command output and system messages. For example, vdisk for disk groups and pools.
- `v3` or `virtual`: Uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, disk group for disk groups and pool for pools. This is the default.

To change the management mode for the current CLI session only, use the `set cli-parameters` command.

`[ses enabled|disabled|on|off]`

Optional. Enables or disables the in-band SCSI Enclosure Services (SES) management interface. This is disabled by default.

`[sftp enabled|disabled|on|off]`

Optional. Enables or disables SSH File Transfer Protocol (SFTP), a secure secondary interface for installing firmware updates, installing security certificates and keys and downloading logs. All data sent between the client and server will be encrypted. This is enabled by default.

To set the port numbers to use for `SFTP` and `SSH`, set the sftp-port and ssh-port parameters, respectively. The port numbers must differ

`[sftp-port port]`

Optional. Specifies the port number to use for SFTP. The default is 1022.

`[slp enabled|disabled|on|off]`

Optional. Enables or disables the Service Location Protocol (SLP) interface. SLP is a discovery protocol that enables computers and other devices to find services in a LAN without prior configuration. This system uses SLP v2. This is enabled by default.

SMI-S uses SLP to advertise WBEM interfaces. If SMI-S is enabled, disabling SLP will prevent WBEM interfaces from being advertised.

`[smis enabled|disabled|on|off]`

Optional. Enables or disables the secure Storage Management Initiative Specification interface (SMI-S) interface. This option allows SMI-S clients to communicate with each embedded SMI-S provider of the controller via HTTPS port 5989. HTTPS port 5989 and HTTP port 5988 cannot be enabled at the same time, so enabling this option will disable port 5988. This is disabled by default.

SMI-S uses SLP to advertise WBEM interfaces. To use SMI-S and advertise WBEM interfaces you must enable the `smis` parameter and the `slp` parameter.

`[snmp enabled|disabled|on|off]`

Optional. Enables or disables the Simple Network Management Protocol interface. Disabling this option disables all SNMP requests to the MIB and disables SNMP traps. To configure SNMP traps use the `set snmp-parameters` command. This is disabled by default.

`[ssh enabled|disabled|on|off]`

Optional. Enables or disables the secure shell CLI. This is enabled by default.

	`[ssh-port port]`
	Optional. Specifies the port number to use for SSH. The default is 22.
	`[telnet enabled|disabled|on|off]`
	Optional. Enables or disables the standard CLI. This is disabled by default.
	`[usmis enabled|disabled|on|off]`
	Optional. Enables or disables the unsecure Storage Management Initiative Specification (SMI-S) interface. This option allows SMI-S clients to communicate with each controller's embedded SMI-S provider via HTTP port 5988. HTTP port 5988 and HTTPS port 5989 cannot be enabled at the same time, so enabling this option will disable port 5989. This is disabled by default.
	SMI-S uses SLP to advertise WBEM interfaces. To use SMI-S and advertise WBEM interfaces you must enable the `smis` parameter and the `slp` parameter.

Examples	Disable unsecure HTTP connections and enable FTP.
	`# set protocols http disabled ftp enabled`
	Enable Telnet, which is an unsecured protocol.
	`# set protocols telnet enabled`
	Set the default management mode to virtual.
	`# set protocols management-mode virtual`
	Enable SFTP and set it to use port 2020.
	`# set protocols sftp enabled sftp-port 2020`

See also	set cli-parameters show protocols

set replication-set

Description	Changes parameters for a replication set. This command applies to virtual storage only. For a replication set with a single primary volume, you can change the name, queue policy, snapshot history, and snapshot-retention policy settings. For a replication set with a primary volume group, you can change the name and queue policy only. Volume membership cannot change for the life of the replication set. You can run this command on either the primary or secondary system.
Minimum role	manage

Syntax	`set replication-set`
	`[name new-name]`
	`[queue-policy discard|queue-latest]`
	`[snapshot-basename basename]`
	`[snapshot-count #]`
	`[snapshot-history disabled|off|secondary|both]`
	`[snapshot-retention-priority never-delete|high|medium|low]`
	`current-replication-set-ID`

Parameters	`[name new-name]` Optional. Specifies a new name for the replication set. Input rules: • The value is case sensitive. • The value can have a maximum of 32 bytes.

- The value can include spaces and printable UTF-8 characters except: " , . < \
- A value that includes a space must be enclosed in double quotes. If you change this parameter while a replication is running, the replication set will be immediately renamed but the current replication will not be affected.

`[queue-policy discard|queue-latest]`

Optional. Specifies the action to take when a replication is running and a new replication is requested.

- `discard`: Discard the new replication request.
- `queue-latest`: Take a snapshot of the primary volume and queue the new replication request. If the queue contained an older replication request, discard that older request. A maximum of one replication can be queued. This is the default.

If you change this parameter while a replication is running, the change will affect subsequent replications but not the current replication.

NOTE: If the queue policy is queue-latest and a replication is running and another is queued, you cannot change the queue policy to discard. You must manually remove the queued replication before you can change the policy.

`[snapshot-basename basename]`

Optional if `snapshot-history` is set to `disabled` or `off`. Required if `snapshot-history` is set to `secondary` or `both`. Specifies a prefix to help you identify replication snapshots. Input rules:

- The value is case sensitive.
- The value can have 1-26 bytes.
- The value can include spaces and printable UTF-8 characters except: " , . < \
- A value that includes a space must be enclosed in double quotes.

If you change this parameter while a replication is running, for the current replication it will affect the name of the snapshot on the secondary system. For that replication only, the names of the snapshots on the primary and secondary systems will differ.

`[snapshot-count #]`

Optional if `snapshot-history` is set to `disabled` or `off`. Required if `snapshot-history` is set to `secondary` or `both`.

Specifies the number of snapshots taken of the replication volume to retain, from 1 to 16. When a new snapshot exceeds this limit, the oldest snapshot in the snapshot history is deleted.

The `snapshot-count` setting can be changed at any time. Its value must be greater than the number of existing snapshots in the replication set, regardless of whether `snapshot-history` is enabled.

If you change this parameter while a replication is running, for the current replication it will affect only the secondary system. In this case the value can only be increased, so you might have one less expected snapshot on the primary system than on the secondary system.

`[snapshot-history disabled|off|secondary|both]`

Optional. Specifies whether to maintain a replication snapshot history for the replication set, as described above.

- `disabled` or `off`: A snapshot history will not be kept. If this parameter is disabled after a replication set has been established, any existing snapshots will be kept, but not updated. This option is the default
- `secondary`: A snapshot history set will be kept on the secondary system for the secondary volume, using `snapshot-count` and `snapshot-basename` settings.
- `both`: A snapshot history will be kept for the primary volume on the primary system and for the secondary volume on the secondary system. Both snapshot histories will use the same `snapshot-count` and `snapshot-basename` settings.

If you change this parameter while a replication is running, for the current replication it will affect only the snapping of the secondary volume.

`[snapshot-retention-priority never-delete|high|medium|low]`

Optional. For virtual storage, this specifies the retention priority for history snapshots, which is used when automatic deletion of snapshots is enabled by using the set snapshot-space command. In a

	snapshot tree, only leaf snapshots can be deleted automatically. Deletion based on retention priority is unrelated to deleting the oldest snapshots to maintain a snapshot count. • `never-delete`: Snapshots will never be deleted automatically to make space. The oldest snapshot in the snapshot history will be deleted once the `snapshot-count` value has been exceeded. This is the default • `high`: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted. • `medium`: Snapshots can be deleted after all eligible low-priority snapshots have been deleted. • `low`: Snapshots can be deleted. If you change this parameter while a replication is running, for the current replication it will affect just the secondary snapshot. An optional primary snapshot will already be created before the change takes affect. `current-replication-set-ID` Specifies the current name or serial number of the replication set for which to change the name.

Examples	Rename the replication set `Rep1` to `RepSet1`.
	`# set replication-set name RepSet1 Rep1`
	Change replication set `RepSet1`'s queue policy to discard a new replication request when a replication is running.
	`# set replication-set queue-policy discard RepSet1`
	For replication set `RepSet1` with primary volume Data, enable snapshot history for the secondary volume only, allowing up to 10 replication snapshots with the basename `repsnapData` to be retained for that volume.
	`# set replication-set snapshot-history secondary snapshot-basename repsnapData snapshot-count 10 RepSet1`

See also	create replication-set delete replication-set resume replication-set show replication-sets suspend replication-set

set schedule

Description	Changes parameters for a specified schedule. If you want to change the schedule name, create a new schedule to replace the existing one. You must specify at least one of the optional parameters for the command to succeed. You can schedule a replication task on the primary system only. Virtual replication tasks are not queued: if a replication task is running and the time comes for that replication task to start again, that task will be skipped, though it will be counted against the schedule's count constraint (if set).
Minimum role	manage

Syntax	`set schedule`
	`[schedule-specification "specification"]`
	`[task-name task-name]`
	`schedule-name`

Parameters	`[schedule-specification "specification"]`

	Optional. Defines when the task will first run, and optionally when it will recur and expire. You can use a comma to separate optional conditions. Dates cannot be in the past. For times, if neither AM nor PM is specified, a 24-hour clock is used.
	• `start yyyy-mm-dd hh:mm [AM|PM]`
	Specifies a date and a time in the future to be the first instance when the scheduled task will run, and to be the starting point for any specified recurrence.
	• `[every # minutes|hours|days|weeks|months|years]`
	Specifies the interval at which the task will run.
	For better performance when scheduling a TakeSnapshot task that will run under heavy I/O conditions or on more than three volumes, the retention count and the schedule interval should be set to similar values. For example if the retention count is 10, then the interval should be set to 10 minutes.
	For a Replicate task, the minimum interval is 30 minutes.
	• `[between hh:mm [AM|PM] and hh:mm [AM|PM]]`
	Constrains the time range during which the task is permitted to run. Ensure that the start time is within the specified time range.
	• `[only any|first|second|third|fourth|fifth|last|#st|#nd|#rd|#th day| weekday|weekendday| Sunday|Monday|Tuesday|Wednesday|Thursday|Friday| Saturday of year|month|January|February| March|April|May|June|July| August|September|October|November|December]`
	Constrains the days or months when the task is permitted to run. Ensure that this constraint includes the start date
	• `[count #]`
	Constrains the number of times the task is permitted to run
	• `[expires yyyy-mm-dd hh:mm [AM|PM]]`
	Specifies when the schedule expires, after which the task will no longer run
	`[task-name task-name]`
	Optional. The name of an existing task to run. A name that includes a space must be enclosed in double quotes.
	`schedule-name`
	The name of the schedule to change. A name that includes a space must be enclosed in double quotes.

Examples	Change parameters, including the associated task, for schedule `Sched1`. `# set schedule schedule-specification "start 2015-01-01 00:01 every 1 days expires 2015-12-31 00:01" task-name Task1 Sched1`
See also	show schedules show tasks

set snapshot-space

Description	Sets the snapshot space usage as a percentage of the pool and thresholds for notification. You can set the percent of the pool that can be used for snapshots (the snapshot space). **NOTE:** If the percentage of the pool used by snapshots is higher than the percentage specified in this command, the command will fail. You can specify a limit policy to enact when the snapshot space reaches the percentage. You can set the policy to either notify you via the event log that the percentage has been reached (in which case

	the system continues to take snapshots, using the general pool space), or to notify you and trigger automatic deletion of snapshots. If automatic deletion is triggered, snapshots are deleted according to their configured retention priority. Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion. The system generates events when the percentage of snapshot space used crosses low, middle, or high thresholds. The event is generated when the percentage exceeds or drops below the threshold. You can set the percentages for the thresholds.
Minimum role	manage

Syntax	`set snapshot-space`
	`[high-threshold` *`percent-of-snap-space`*`%]`
	`[limit` *`percent-of-pool`*`%]`
	`[limit-policy notify-only|delete]`
	`[low-threshold` *`percent-of-snap-space`*`%]`
	`[middle-threshold` *`percent-of-snap-space`*`%]`
	`pool A|B`

Parameters	`[high-threshold` *`percent-of-snap-space`*`%]`
	Optional. Specifies a percentage of the snapshot space for the high threshold. Enter a value from 1% to 100%. It must be greater than or equal to the middle threshold. The default is 99%. When this threshold is exceeded, event 571 is logged with Warning severity.
	`[limit` *`percent-of-pool`*`%]`
	Optional. Specifies the snapshot space. Enter a value from 1% to 100%. The default is 10%.
	`[limit-policy notify-only|delete]`
	Optional. Specifies the limit policy for when the percentage of the pool designated for snapshots is reached.
	• `notify-only`: When the snapshot space is reached an event is generated and logged. This is the default.
	• `delete`: When the snapshot space is reached an event is generated and logged and automatic deletion of snapshots occurs.
	`[low-threshold` *`percent-of-snap-space`*`%]`
	Optional. Specifies a percentage of the snapshot space for the low threshold. Enter a value from 1% to 100%. The default is 75%. When this threshold is exceeded, event 571 is logged with Informational severity.
	`[middle-threshold` *`percent-of-snap-space`*`%]`
	Optional. Specifies a percentage of the snapshot space for the middle threshold. Enter a value from 1% to 100%. It must be greater than or equal to the low threshold. The default is 90%. When this threshold is exceeded, event 571 is logged with Informational severity
	`. pool A|B`
	The pool for which to create the snapshot space usage.

Examples	For pool A, limit the maximum amount of pool space that can be occupied by snapshot data to 15%, set the middle-threshold warning event to be logged when 85% of that space has filled, and set a policy to automatically delete snapshots (per deletion rules) when the 15% limit is reached. `# set snapshot-space pool A limit 15% middle-threshold 85% limit-policy delete`
See also	show snapshot-space show pools

set snmp-parameters

Description	Sets SNMP parameters for event notification. To enable or disable SNMP requests to the MIB use the `set protocols` command.
Minimum role	manage

Syntax	`set snmp-parameters`
	`[add-trap-host address]`
	`[del-trap-host address]`
	`[enable crit|error|warn|resolved|info|none]`
	`[read-community string]`
	`[trap-host-list addresses]`
	`[write-community string]`

Parameters	`[add-trap-host address]`
	Optional. Specifies the network address of a destination host that will receive traps. The value can be an IPv4 address, IPv6 address, or FQDN. Three trap hosts can be set.
	`[del-trap-host address]`
	Optional. Specifies the network address of a destination host to delete. The value can be an IPv4 address, IPv6 address, or FQDN.
	`[enable crit|error|warn|resolved|info|none]`
	Optional. Sets the level of trap notification:
	• `crit`: Sends notifications for Critical events only.
	• `error`: Sends notifications for Error and Critical events.
	• `warn`: Sends notifications for Warning, Error, and Critical events.
	• `resolved`: Sends notifications for Resolved, Warning, Error, and Critical events.
	• `info`: Sends notifications for all events.
	• `none`: All events are excluded from trap notification and traps are disabled. This is the default. However, Critical events and managed-logs events 400–402 are sent regardless of the notification setting.
	`[read-community string]`
	Optional. Specifies the SNMP read password for your network. This string is included in traps that are sent. This string must differ from the write-community string. Input rules:
	• The value is case sensitive.
	• The value can have a maximum of 31 bytes.
	• The value can include any character except: " <>
	• A value that includes a space must be enclosed in double quotes.
	The default is `public`.
	`[trap-host-list addresses]`
	Optional. Specifies the network addresses of hosts that are configured to receive SNMP traps. Each value can be an IPv4 address, IPv6 address, or FQDN. Three trap hosts can be set. The value can have a maximum of 79 bytes.
	`[write-community string]`
	Optional. Sets a community string for write access. This string must differ from the read-community string. Input rules:
	• The value is case sensitive.
	• The value can have a maximum of 31 bytes.
	• The value can include any characters characters except: " <>
	• A value that includes a space must be enclosed in double quotes.
	The default is private.

Examples	Enable Critical events only, specify a trap host, and set the community string for read-only access. `# set snmp-parameters enable crit add-trap-host 172.22.4.171 read-community public`
See also	set protocols show snmp-parameters test (with the `snmp` parameter)

set support-assist

Description	Sets parameters for the SupportAssist feature. When you specify to enable this feature, the CLI will present an agreement with a confirmation prompt. The agreement allows remote monitoring of the storage system, collection of diagnostic information, and transmission of that data to a remote support server. Reply yes to enable the support service or no to leave it disabled. After enabling the service, you can use the `set support-assist-info` command to enter customer information, and then use the `check support-assist` command to check connectivity to the SupportAssist server
Minimum role	standard

Syntax	`set support-assist`
	`[maintenance-mode enabled|disabled|on|off]`
	`[state pause|resume]`
	`[enabled|disabled|on|off]`

Parameters	At least one parameter must be specified.
	`maintenance-mode [enabled|disabled|on|off]`
	Optional. Puts the system into maintenance mode to notify SupportAssist not to create support tickets during planned system downtime.
	• `enabled` or `on` – Enables maintenance mode.
	• `disabled` or `off` – Disables maintenance mode. This is the default.
	NOTE: If you specify the `maintenance-mode` parameter, do not specify other parameters.
	`[state pause|resume]`
	Optional. Allows you temporarily suspend the service without disabling the feature.
	• `pause` – Suspends transmitting data to the support server.
	• `resume` – Resumes transmitting data to the support server from the moment the service is resumed.
	`[enabled|disabled|on|off]`
	Optional.
	• `enabled` or `on` – Enables the SupportAssist feature.
	• `disabled` or `off` – Disables the SupportAssist feature
	NOTE: If you specify this parameter, do not specify the `maintenance-mode` parameter.

Examples	Enable the SupportAssist feature.
	`# set support-assist enable`
	Temporarily suspend the SupportAssist service.
	`# set support-assist state pause`
	Put the system into maintenance mode.

	`# set support-assist maintenance-mode on`
See also	check support-assist send support-assist-logs set support-assist-info show support-assist

set support-assist-info

Description	Sets customer information for the SupportAssist feature.
Minimum role	manage
Syntax	`set support-assist-info` `[address-city-town value]` `[address-country-territory AFG|ALA|ALB|DZA|ASM|AND|AGO|AIA|ATA|ATG|ARG|ARM|ABW|AUS|AUT|AZE|BHS|BGD|BRB|BLR|BEL|BLZ|BEN|BMU|BHR|VEN|BES|BIH|BWA|BVT|BRA|IOT|BRN|BTN|BGR|BFA|BDI|CPV|KHM|CMR|CAN|CYM|CAF|TCD|CHL|CHN|CXR|CCK|COL|COM|COG|COK|CRI|CIV|HRV|CUB|CUW|CYP|CZE|PRK|DNK|DJI|DMA|DOM|ECU|EGY|SLV|GNQ|ERI|EST|ETH|FLK|FRO|FSM|FJI|FIN|FRA|GUF|PYF|ATF|GAB|GMB|GEO|DEU|GHA|GIB|GRC|GRL|GRD|GLP|GUM|GTM|GGY|GIN|GNB|GUY|HTI|HMD|HND|HKG|HUN|ISL|IND|IDN|IRQ|IRL|IRN|IMN|ISR|ITA|JAM|JPN|JEY|JOR|KAZ|KEN|KIR|KWT|KGZ|LAO|LVA|LBN|LSO|LBR|LBY|LIE|LTU|LUX|MAC|MDG|MWI|MYS|MDV|MLI|MLT|MHL|MTQ|MRT|MUS|MYT|MEX|MCO|MNG|MNE|MSR|MAR|MOZ|MMR|NAM|NRU|NPL|NLD|ANT|NCL|NZL|NIC|NER|NGA|NIU|NFK|MNP|NOR|OMN|PAK|PLW|PAN|PNG|PRY|PER|PHL|PCN|BOL|POL|PRT|PRI|QAT|KOR|MDA|REU|ROU|RUS|RWA|BLM|SHN|KNA|LCA|MAF|SPM|VCT|WSM|SMR|STP|SAU|SEN|SRB|SCG|SYC|SLE|SGP|SXM|SVK|SVN|SLB|SOM|ZAF|SGS|SSD|ESP|LKA|PSE|SDN|SUR|SJM|SWZ|SWE|CHE|SYR|TWN|TJK|THA|COD|MKD|TLS|TGO|TKL|TON|TTO|TUN|TUR|TKM|TCA|TUV|UGA|UKR|ARE|GBR|TZA|USA|UMI|URY|UZB|VUT|VAT|VNM|VGB|VIR|WLF|ESH|YEM|ZMB|ZWE]` `[address-line1 value]` `[address-line2 value]` `[address-line3 value]` `[address-state-province-region value]` `[address-zip-postal-code value]` `[alternate-email-address value]` `[alternate-phone-number value]` `[company-country-territory AFG|ALA|ALB|DZA|ASM|AND|AGO|AIA|ATA|ATG|ARG|ARM|ABW|AUS|AUT|AZE|BHS|BGD|BRB|BLR|BEL|BLZ|BEN|BMU|BHR|VEN|BES|BIH|BWA|BVT|BRA|IOT|BRN|BTN|BGR|BFA|BDI|CPV|KHM|CMR|CAN|CYM|CAF|TCD|CHL|CHN|CXR|CCK|COL|COM|COG|COK|CRI|CIV|HRV|CUB|CUW|CYP|CZE|PRK|DNK|DJI|DMA|DOM|ECU|EGY|SLV|GNQ|ERI|EST|ETH|FLK|FRO|FSM|FJI|FIN|FRA|GUF|PYF|ATF|GAB|GMB|GEO|DEU|GHA|GIB|GRC|GRL|GRD|GLP|GUM|GTM|GGY|GIN|GNB|GUY|HTI|HMD|HND|HKG|HUN|ISL|IND|IDN|IRQ|IRL|IRN|IMN|ISR|ITA|JAM|JPN|JEY|JOR|KAZ|KEN|KIR|KWT|KGZ|LAO|LVA|LBN|LSO|LBR|LBY|LIE|LTU|LUX|MAC|MDG|MWI|MYS|MDV|MLI|MLT|MHL|MTQ|MRT|MUS|MYT|MEX|MCO|MNG|MNE|MSR|MAR|MOZ|MMR|NAM|NRU|NPL|NLD|ANT|NCL|NZL|NIC|NER|NGA|NIU|NFK|MNP|NOR|OMN|PAK|PLW|PAN|PNG|PRY|PER|PHL|PCN|BOL|POL|PRT|PRI|QAT|KOR|MDA|REU|ROU|RUS|RWA|BLM|SHN|KNA|LCA|MAF|SPM|VCT|WSM|SMR|STP|SAU|SEN|SRB|SCG|SYC|SLE|SGP|SXM|SVK|SVN|SLB|SOM|ZAF|SGS|SSD|ESP|LKA|PSE|SDN|SUR|SJM|SWZ|SWE|CHE|SYR|TWN|TJK|THA|COD|MKD|TLS|`

	TGO|TKL|TON|TTO|TUN|TUR|TKM|TCA|TUV|UGA|UKR|ARE|GBR|TZA|USA|UMI|URY| UZB|VUT|VAT|VNM|VGB|VIR| WLF|ESH|YEM|ZMB|ZWE] [company-name *value*] [email-address *value*] [email-notifications enabled|disabled|on|off] [first-name *value*] [last-name *value*] [phone-number *value*] [preferred-contact-hours-end-time *value*] [preferred-contact-hours-start-time *value*] [preferred-contact-method Email|Phone] [preferred-email-language cs|da|de|el|en|es|es-LA|fi|fr|fr-CA|he|it| ja|ko|nl|no|pl|pt|pt-BR| ru|sk|sv|th|tr|zh-CN|zh-TW] [time-zone -12:00|-11:00|-10:00|-09:30|-09:00|-08:00|-07:00|-06:00|-05:00|-04:00| -03:30| -03:00|-02:00|-01:00|-00:00|+01:00|+02:00|+03:00|+03:30|+04:00|+04:30| +05:00|+05:30|+05:45| +06:00|+06:30|+07:00|+08:00|+08:30|+08:45|+09:00|+09:30]
Parameters	At least one parameter must be specified. Most parameters are self-evident and their values are case sensitive. However: • The `address-country-territory`, `company-country-territory`, `email-notifications`, `preferred-contact-method`, `preferred-email-language`, and `time-zone` values are not case sensitive. • The `phone-number` value can contain spaces and punctuation characters such as plus sign, parentheses, periods, and hyphens. • The `preferred-contact-hours` parameters require time values in the format `hh:mm`, using a 24-hour clock. For example, `18:55`.
Examples	Set contact information for the SupportAssist feature. `# set support-assist-info email-address jsmith@mycompany.com preferred-email-language en email-notifications enabled`
See also	check support-assist send support-assist-logs set support-assist show support-assist

set support-assist-proxy

Description	Sets parameters for the SupportAssist Proxy feature. You can enable or disable the feature and configure a proxy host and port to use for HTTP communication.
Minimum role	manage
Syntax	`set support-assist-proxy` [`host` *IP-or-name*] [`password` *proxy-password*] [`port` *port*] {`protocol HTTP`] [`user` *proxy-user*] [`enabled|disabled|on|off`]

Parameters	At minimum the host and port parameters must be specified when you enable this feature the first time.
	[`host` *IP-or-name*]
	Optional. Specifies the IPv4 address or name of a proxy host.
	[`port` *port*]
	Optional. Specifies the port number to use on the proxy host.
	`protocol HTTP`
	Optional. Specifies the communication protocol. Only HTTP is supported.
	[`user` *proxy-user*]
	Optional. Specifies the proxy user name to use to access the proxy server.
	[`password` *proxy-password*]
	Optional. Specifies the proxy password to use to access the proxy host.
	`enabled|disabled|on|off`
	• `enabled` or `on` – Enables the feature.
	• `disabled` or `off` – Disables the feature.

Examples	Enable the SupportAssist Proxy feature. `# set support-assist-proxy enable host 10.2.2.2 port 1234`
See also	check support-assist clear support-assist-proxy send support-assist-logs set support-assist set support-assist-info show support-assist

set syslog-parameters

Description	Sets remote syslog notification parameters for events and managed logs. This allows events to be logged by the syslog of a specified host computer. Syslog is a protocol for sending event messages across an IP network to a logging server. This feature supports User Datagram Protocol (UDP) but not Transmission Control Protocol (TCP).
Minimum role	manage

Syntax	`set syslog-parameters`
	`[host address]`
	`[host-ip address]`
	`[host-port port-number]`
	`notification-level crit|error|warn|resolved|info|none`

Parameters	`[host address]`
	Optional. The network address for the host. The value can be an IPv4 address, IPv6 address, or FQDN. If `notification-level` is other than none, the host parameter must be specified.
	`[host-ip address]`
	Deprecated—use the host parameter instead.
	`[host-port port-number]`
	Optional. A specific port number on the host.

	`notification-level crit|error|warn|resolved|info|none` The minimum severity for which the system should send notifications: • `crit`: Sends notifications for Critical events only. • `error`: Sends notifications for Error and Critical events. • `warn`: Sends notifications for Warning, Error, and Critical events. • `resolved`: Sends notifications for Resolved, Warning, Error, and Critical events. • `info`: Sends notifications for all events. • `none`: Disables syslog notification. If notification-level is other than none, the host parameter must be specified.
Examples	Set the system to send an entry to the remote server at *10.1.1.10* on port *514* when a critical event occurs. `# set syslog-parameters notification-level crit host 10.1.1.10 host-port`
See also	show syslog-parameters test

set system

Description	Sets the system name, contact person, location, and description. The name, location, and contact are included in event messages. All four values are included in system debug logs for reference by service personnel. When using the PowerVault Manager, the system name appears in the browser title bar or tab. Input rules for each value: • The value is case sensitive. • The value can have a maximum of 79 bytes. • The value can include spaces and printable UTF-8 characters except: " <> \ • A value that includes a space must be enclosed in double quotes.
Minimum role	manage

Syntax	`set system`
	`[contact value]`
	`[info value]`
	`[location value]`
	`[name value]`

Parameters	`[contact value]`
	Optional. The name of the person who administers the system. The default is `Uninitialized Contact`.
	`[info value]`
	Optional. A brief description of what the system is used for or how it is configured. The default is `Uninitialized Info`.
	`[location value]`
	Optional. The location of the system. The default is `Uninitialized Location`.
	`[name value]`
	Optional. A name to identify the system. The default is `Uninitialized Name`.

Examples	Set the system name to `Test` and the contact to `J. Doe`. `# set system name Test contact "J. Doe"`

See also	show system

set task

Description	Changes parameters for a TakeSnapshot or VolumeCopy task. For these types of tasks, you can change parameters other than name, type, or associated volumes. If you change the parameters for a running task, the changes will take effect the next time the task runs. If you want to change parameters for a ResetSnapshot task or the name, type, or associated volumes for another type of task, create a new task to replace the existing one.
Minimum role	manage

Syntax	`set task`
	`[last-snapshot]`
	`[replication-set]`
	`[retention-count #]`
	`[snapshot-prefix prefix]`
	name

Parameters	`[last-snapshot]`
	Optional. For a Replicate task this specifies to replicate the most recent snapshot of the primary volume. This snapshot may have been created either manually or by the snapshot history feature.
	`[replication-set]`
	Optional. For a Replicate task this specifies the ID of the replication set to replicate.
	`[retention-count #]`
	Optional. For a `TakeSnapshot` task this specifies the number of snapshots created by this task to retain, from 1 to 8 if the large-pools feature is enabled, or from 1 to 16 if the large-pools feature is disabled. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted. If you reduce the retention count for a task, excess snapshots will be removed the next time the task runs.
	`[snapshot-prefix prefix]`
	Optional. For a `TakeSnapshot` task this specifies a label to identify snapshots created by this task. Input rules:
	• The value is case sensitive.
	• The value can have a maximum of 32 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , < \
	• A value that includes a space must be enclosed in double quotes.
	name
	The name of the task to change. Input rules:
	• The value is case sensitive.
	• The value can have a maximum of 32 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , < \
	• A value that includes a space must be enclosed in double quotes.

Examples	Change parameters for a `TakeSnapshot-type` task named Snap. `# set task snapshot-prefix VD1v1 retention-count 2 Snap`
See also	create task delete task set schedule

	show schedules show tasks

set user

Description	Changes user preferences for the session or permanently. The system requires at least one CLI user with the manage role to exist. A user with the manage role can change any parameter except name. A user with the monitor role can change any parameter for that user except name, roles, and interfaces. **NOTE:** User changes take effect the next time that the user logs in.
Minimum role	monitor

Syntax	`set user`
	`[authentication-type MD5|SHA|none]`
	`[base 2|10]`
	`[interfaces` *`interfaces`*`]`
	`[locale English|en|Spanish|es|French|fr|German|de|Japanese|ja|Korean|ko|nl| Chinese-simplified|zh-s|zh-t]`
	`[password` *`password`*`]`
	`[precision #]`
	`[privacy-password` *`encryption-password`*`]`
	`[privacy-type DES|AES|none]`
	`[roles` *`roles`*`]`
	`[session-preferences]`
	`[storage-size-base 2|10]`
	`[storage-size-precision #]`
	`[storage-size-units auto|MB|GB|TB]`
	`[temperature-scale celsius|c|fahrenheit|f]`
	`[timeout #]`
	`[trap-host` *`address`*`]`
	`[type novice|standard|advanced|diagnostic]`
	`[units auto|MB|GB|TB]`
	`name`

Parameters	`[authentication-type MD5|SHA|none]`
	Optional. For an SNMPv3 user, this specifies whether to use a security authentication protocol. This parameter requires the `password` parameter and, for the `snmptarget` interface, the `trap-host` parameter.
	• `MD5`: MD5 authentication. This is the default.
	• `SHA`: SHA-1 authentication.
	• `none`: No authentication.
	`[base 2|10]`
	Optional. Sets the base for entry and display of storage-space sizes:
	• `2`: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude. In base 2 when you set a size, whether you specify a base-2 or base-10 size unit, the resulting size will be in base 2.

- `10`: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. This is the default. In base 10 when you set a size, the resulting size will be in the specified unit. This option is the default.

Operating systems usually show volume size in base 2. Disk drives usually show size in base 10. Memory (RAM and ROM) size is always shown in base 2.

`[interfaces` *`interfaces`*`]`

Optional. Specifies the interfaces that the user can access. Multiple values must be separated by commas and no spaces

- `cli`: Command-line interface. This is enabled by default.
- `wbi`: PowerVault Manager web-browser interface. This is enabled by default.
- `ftp`: FTP or SFTP interface.
- `smis`: Storage Management Initiative Specification (SMI-S) interface.
- `snmpuser`: Allows an SNMPv3 user to view the SNMP MIB.
- `snmptarget`: Allows an SNMPv3 user to receive SNMP trap notifications. This option requires the trap-host parameter.
- `none`: No interfaces.

The smis option is not supported for a user with the monitor or diagnostic role. A command that specifies snmpuser or snmptarget cannot also specify a non-SNMP interface. To enable or disable protocols that can be used to access interfaces, use the `set protocols` command.

`[locale English|en|Spanish|es|French|fr|German|de|Japanese|ja|Korean|ko|nl|Chinese-simplified|zh-s|zh-t]`

Optional. The display language. The default is English.

`[password` *`password`*`]`

Optional in console format; required for API format. Input rules:

- The value is case sensitive.
- The value can have 8–32 characters.
- The value can include spaces and printable UTF-8 characters except: " , < >\
- A value that includes only printable ASCII characters must include at least one uppercase character, one lowercase character, one numeric character, and one non-alphanumeric character.
- For an SNMPv3 user whose authentication-type parameter is set to use authentication, this specifies the authentication password.

`[precision #]`

Optional. Sets the number of decimal places (1–10) for display of storage-space sizes. The default is 1.

`[privacy-password` *`encryption-password`*`]`

Optional. For an SNMPv3 user whose privacy-type parameter is set to use encryption, this specifies the encryption password.

- The value is case sensitive and must contain 8–32 characters.
- A password can contain these symbols: ^ _ + : , . @
- If the password contains only printable ASCII characters then it must contain at least one uppercase character, one lowercase character, one numeric character, and one non-alphanumeric character.

`[privacy-type DES|AES|none]`

Optional. For an SNMPv3 user, this specifies whether to use a security encryption protocol. This parameter requires the `privacy-password` parameter and the `authentication-type` parameter.

- `DES`: Data Encryption Standard.
- `AES`: Advanced Encryption Standard.
- `none`: No encryption. This is the default.

`[roles` *`roles`*`]`

Optional. Specifies the user's roles as one or more of the following values:

	• `monitor`: User can view but not change system settings. This is the default.
	• `manage`: User can view and change system settings.
	• `diagnostic`: User can view and change system settings.
	Multiple values must be separated with a comma (with no spaces). If multiple values are specified, the user's access to commands will be determined by the highest role specified.
	`[session-preferences]`
	Optional. Specifies that the current CLI settings will become permanent settings for the user. This parameter cannot be combined with any other parameter.
	`[storage-size-base 2|10]`
	Optional. Alias for `base`.
	`[storage-size-precision #]`
	Optional. Alias for `precision`.
	`[storage-size-units auto|MB|GB|TB]`
	Optional. Alias for `units`.
	`[temperature-scale celsius|c|fahrenheit|f]`
	Optional. Sets the scale for display of temperature values:
	• `fahrenheit` or `f`: Temperatures are shown in degrees Fahrenheit.
	• `celsius` or `c`: Temperatures are shown in degrees Celsius. This is the defaul.t
	`[timeout #]`
	Optional. Sets the timeout value in seconds for the login session. Valid values are 120–43200 seconds (2–720 minutes). The default is 1800 seconds (30 minutes).
	`[trap-host` *`address`*`]`
	Optional. For an SNMPv3 user whose interface parameter is set to `snmptarget`, this specifies the network address of the host that will receive SNMP traps. The value can be an IPv4 address, IPv6 address, or FQDN.
	`[type novice|standard|advanced|diagnostic]`
	Optional. Identifies the user's experience level. This parameter is informational only and does not affect access to commands. The default is standard.
	`[units auto|MB|GB|TB]`
	Optional. Sets the unit for display of storage-space sizes:
	• `auto`: Sizes are shown in units determined by the system. This is the default.
	• `MB`: Sizes are shown in megabytes.
	• `GB`: Sizes are shown in gigabytes.
	• `TB`: Sizes are shown in terabytes.
	Based on the `precision` setting, if a size is too small to meaningfully display in the selected unit, the system uses a smaller unit for that size. For example, if units is set to TB, precision is set to 1, and base is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.
	`name`
	Specifies the user account to change. A name that includes a space must be enclosed in double quotes.
	`name`
	Specifies the user account to change.

Examples	Change the temperature scale and accessible interfaces for user `jsmith`.
	`# set user jsmith temperature-scale f interfaces wbi,cli`
	Change the password for user `JDoe`.
	`# set user JDoe password Abcd%1234`
	Change the authentication type for SNMPv3 user `Traps`.

	`# set user Traps authentication-type SHA password Snmp3%Trap`
See also	set password show users

set vdisk

Description	Changes parameters for a specified linear disk group. This command applies to linear storage only.
Minimum role	manage

Syntax	`set vdisk`
	`[adapt-spare-capacity` *size*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default]`
	`[name` *new-name*`]`
	`[owner a|b]`
	`[spin-down-delay delay]`
	vdisk

Parameters	`[adapt-spare-capacity` *size*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default]`
	Optional. For an ADAPT disk group, this specifies the target spare capacity.
	• *size* `[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`: Sets the target spare capacity to a specific size. The unit is optional (B represents bytes). If no unit is specified, GiB will be used, regardless of the current base. Whichever unit is set, internally the value will be rounded down to the nearest GiB. If the value is set to 0, the absolute minimum spare space will be used. If this parameter is omitted, the default setting will be used.
	• `default`: Sets the target spare capacity to the sum of the two largest disks in the disk group, which is sufficient to fully recover fault tolerance after loss of any two disks in the group.
	`[name` *new-name*`]`
	Optional. A new name for the disk group. A name that includes a space must be enclosed in double quotes.
	`[owner a|b]`
	Optional. The new owner: controller A or B.
	CAUTION: Before changing the owning controller for a disk group, you must stop host I/O to the disk group's volumes. Volume mappings are not affected.
	NOTE: Changing ownership of a disk group while any volumes in the disk group are mapped to live hosts is not supported and may cause data loss or unavailability. All volumes in the disk group must be unmapped or attached hosts must be shut down before the ownership of a disk group is changed.
	`[spin-down-delay delay]`
	Optional. For spinning disks in non-ADAPT disk groups, this sets the period of inactivity after which the disk group's disks and dedicated spares will automatically spin down. Setting the delay to 1–360 minutes will enable spin down. Setting the delay to 0 will disable spin down
	• Spun-down disks are not polled for SMART events.
	• Operations requiring access to disks may be delayed while the disks are spinning back up.
	vdisk
	The name or serial number of the linear disk group to change. Input rules:
	• The value is case sensitive.
	• The value can have a maximum of 32 bytes.
	• The value can include spaces and printable UTF-8 characters except: " , < \
	• A value that includes a space must be enclosed in double quotes.

Examples	Rename linear disk group `VD1` to `VD2` and set its spin-down delay to 10 minutes. `# set vdisk name VD2 spin-down-delay 10 VD1`
See also	show vdisks

set volume

Description	Changes parameters for a volume. **CAUTION: Applying new parameters may disrupt access from connected hosts.** For virtual storage, you can set the retention priority for snapshots of the volume. If automatic deletion of snapshots is enabled, snapshots will be considered for automatic deletion first by priority and then by date, so the oldest low-priority snapshot will be deleted first. A snapshot is eligible for deletion if all the following are true: ● The snapshot has a retention priority other than `never-delete`. ● The snapshot has no child snapshots. ● The snapshot is not mapped to a host. **NOTE:** For virtual storage, changing the retention priority for a volume does not change the retention priority for existing child snapshots.
Minimum role	manage

Syntax	`set volume`
	`[identifying-information` *`description`*`]`
	`[large-virtual-extents enabled|disabled|on|off]`
	`[name` *`new-name`*`]`
	`[snapshot-retention-priority never-delete|high|medium|low]`
	`[tier-affinity no-affinity|archive|performance]`
	`volume`

Parameters	`[identifying-information` *`description`*`]`
	Optional. A description of the volume to help a host-side user identify it. Input rules:
	● The value is case sensitive.
	● The value can have a maximum of 127 bytes.
	● The value can include spaces and printable UTF-8 characters except: < \
	● A value that includes a space must be enclosed in double quotes.
	`[large-virtual-extents enabled|disabled|on|off]`
	Optional. For a virtual volume, this sets whether the system will try to allocate pages in a sequentially optimized way to reduce I/O latency and improve performance.
	● `disabled` or `off`: Optimized page allocation is disabled. This is the default.
	● `enabled` or `on`: Optimized page allocation is enabled
	`[name` *`new-name`*`]`
	Optional. A new name for the volume. Input rules:
	● The value is case sensitive.
	● The value can have a maximum of 32 bytes.
	● The value can include spaces and printable UTF-8 characters except: " , < \
	● A value that includes a space must be enclosed in double quotes.
	`[snapshot-retention-priority never-delete|high|medium|low]`
	Optional. For virtual storage, this specifies the retention priority for snapshots of the volume.
	● `never-delete`: Snapshots will never be deleted.
	● `high`: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted.

	• `medium`: Snapshots may be deleted after all eligible low-priority snapshots have been deleted. This is the default. • `low`: Snapshots may be deleted. `[tier-affinity no-affinity|archive|performance]` Optional. For virtual storage, this specifies how to tune the tier-migration algorithm for the volume. The `tier-affinity` setting affects all members of a snapshot tree. • `no-affinity`: This setting uses the highest available performing tiers first and only uses the Archive tier when space is exhausted in the other tiers. Volume data will swap into higher performing tiers based on frequency of access and tier space availability. This is the default. • `archive`: This setting prioritizes the volume data to the least performing tier available. Volume data can move to higher performing tiers based on frequency of access and available space in the tiers. • `performance`: This setting prioritizes volume data to the higher performing tiers. If no space is available, lower performing tier space is used. Performance affinity volume data will swap into higher tiers based upon frequency of access or when space is made available. *`volume`* The name or serial number of the volume to change. A name that includes a space must be enclosed in double quotes.

Examples	Rename volume `Vol1` to `Vol2`.
	`# set volume name Vol2 Vol1`
	Set identifying information for `Vol3`.
	`# set volume identifying-information "Project X data" Vol3`
	Set volume `OldFiles` to have affinity for the Archive tier.
	`# set volume tier-affinity archive OldFiles`
	Change the snapshot retention priority for `Vol1` to low.
	`# set volume snapshot-retention-priority low Vol1`

See also	show maps show volumes

set volume-cache-parameters

Description	Sets cache options for a specified volume or specified volumes. **NOTE:** Only change the read-ahead cache settings if you fully understand how the host operating system, application, and adapter move data so that you can adjust the settings accordingly. Be prepared to monitor system performance and adjust read-ahead size until you find the optimal size for your application. **CAUTION: Changing the cache optimization setting while I/O is active can cause data corruption or loss. Before changing this setting, quiesce I/O from all initiators.**
Minimum role	manage

Syntax	`set volume-cache-parameters`
	`[optimization standard|no-mirror]`
	`[read-ahead-size disabled|adaptive|stripe|512KB|1MB|2MB|4MB|8MB|16MB|32MB]`
	`[write-policy write-back|write-through|wb|wt]`
	`volume` `|all`

Parameters	`[optimization standard|no-mirror]`

	Optional. Sets the cache optimization mode:
	• `standard`: This controller cache mode of operation is optimized for sequential and random I/O and is the optimization of choice for most workloads. In this mode, the cache is kept coherent with the partner controller. This mode gives you high performance and high redundancy. This is the default.
	• `no-mirror`: In this mode of operation, the controller cache performs the same as the standard mode with the exception that the cache metadata is not mirrored to the partner. While this improves the response time of write I/O, it comes at the cost of redundancy. If this option is used, the user can expect higher write performance but is exposed to data loss if a controller fails.
	`[read-ahead-size disabled|adaptive|stripe|512KB|1MB|2MB|4MB|8MB|16MB|32MB]`
	Optional. Controls the use and size of read-ahead cache. You can optimize a volume for sequential reads or streaming data by changing the amount of data read in advance. Read ahead is triggered by sequential accesses to consecutive logical block address (LBA) ranges. Read ahead can be forward (increasing LBAs) or reverse (decreasing LBAs).
	Increasing the read-ahead size can greatly improve performance for multiple sequential read streams. However, increasing read-ahead size will likely decrease random read performance.
	• `disabled`: Disables read ahead.
	• `adaptive`: Enables adaptive read-ahead, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload. This is the default.
	• `stripe`: Sets the read-ahead size to one stripe. The controllers treat NRAID and RAID-1 disk groups internally as if they have a stripe size of 512 KB, even though they are not striped.
	• 512KB, 1MB, 2MB, 4MB, 8MB, 16MB, or 32MB: Sets a specific read-ahead size.
	`[write-policy write-back|write-through|wb|wt]`
	Optional. Sets the cache write policy, which determines when cached data is written to the disks. The ability to hold data in cache while it is being written to disk can increase storage device speed during sequential reads.
	• `write-back` or `wb`: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput. This is the default
	• `write-through` or `wt`: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance
	You can configure the write policy to automatically change from write-back to write-through when certain environmental events occur, such as a fan failure. For details, see help for the set advanced-settings command.
	`volume`
	The name or serial number of the volume to change. A name that includes a space must be enclosed in double quotes.
	`volume` `|all`
	Specifies either:
	• The name or serial number of the volume to change. A name that includes a space must be enclosed in double quotes.
	• `all`: Apply the changes to all volumes.

Examples	Set the cache policy, optimization mode, and read-ahead size for volume `V1`. `# set volume-cache-parameters write-policy wb optimization standard read-ahead-size stripe V1`
See also	show cache-parameters show volumes

set volume-group

Description	Sets the name of a volume group. **NOTE:** You cannot rename a volume group that is in a replication set.
Minimum role	manage
Syntax	`set volume-group` `name` *`new-name`* *`volume-group`*
Parameters	`name` *`new-name`* A new name for the volume group. Input rules: • The value is case sensitive. • The value can have a maximum of 32 bytes. • The value can include spaces and printable UTF-8 characters except: " , .< \ • A value that includes a space must be enclosed in double quotes. *`volume-group`* The current name of the volume group. A value that includes a space must be enclosed in double quotes.
Examples	Change the name of `VGroup1` to `MyVGroup`. `# set volume-group name MyVGroup VGroup1`
See also	show volume-groups

show advanced-settings

Description	Shows the settings for advanced system-configuration parameters.
Minimum role	monitor
Syntax	show advanced-settings

Output	`Disk Group Background Scrub (v3)`
	Shows whether disks in disk groups are automatically checked for disk defects to ensure system health. The interval between a scrub finishing and starting again is specified by the Disk Group `Background Scrub Interval` field.
	• `Disabled`: Background disk scrub is disabled.
	• `Enabled`: Background disk scrub is enabled.
	`Vdisk Background Scrub (v2)`
	Shows whether disks in disk groups are automatically checked for disk defects to ensure system health. The interval between a scrub finishing and starting again is specified by the Vdisk `Background Scrub Interval` field.
	• `Disabled`: Background disk scrub is disabled.
	• `Enabled`: Background disk scrub is enabled.
	`Disk Group Background Scrub Interval (v3)`
	Shows the interval between background disk-group scrub finishing and starting again, from 0 to 360 hours.
	`Vdisk Background Scrub Interval (v2)`
	Shows the interval between background disk-group scrub finishing and starting again, from 0 to 360 hours.
	`Partner Firmware Upgrade`

Shows whether component firmware versions are monitored and will be automatically updated on the partner controller.

- `Disabled`: Partner firmware upgrade is disabled.
- `Enabled`: Partner firmware upgrade is enabled. This is the default.

`Utility Priority`

Priority at which data-redundancy utilities, such as disk-group verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect disk-group background scrub, which always runs at “background” priority.)

- `High`: Utilities have higher priority than host I/O. Use when your highest priority is to return the system to a fully fault-tolerant state. This can cause heavy I/O to be slower than normal.
- `Medium`: Utility performance is balanced with host I/O performance.
- `Low`: Utilities run at a slower rate with minimal effect on host I/O.

`SMART`

Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks.

- `Detect-only`: Each disk in the system retains its individual SMART setting, as will new disks added to the system.
- `Enabled`: SMART is enabled for all disks in the system and will be enabled for new disks added to the system.
- `Disabled`: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.

`Dynamic Spare Configuration`

Shows whether the storage system will automatically use a compatible disk as a spare to replace a failed disk in a disk group if no compatible spare is available.

- `Disabled`: The dynamic spares feature is disabled.
- `Enabled`: The dynamic spares feature is enabled.

`Enclosure Polling Rate`

Shows the interval in seconds at which the storage system will poll each enclosure's Enclosure Management Processor (EMP) for status changes, from 5 to 3600 seconds.

`host cache control`

Shows whether hosts are allowed to use the SCSI MODE SELECT command to change the storage system's write-back cache setting.

- `Disabled`: Host control of caching is disabled.
- `Enabled`: Host control of caching is enabled.

`Sync Cache Mode`

Shows how the SCSI `SYNCHRONIZE CACHE` command is handled.

- `Immediate`: Good status is returned immediately and cache content is unchanged. This option is the default.
- `Flush to disk`: Good status is returned only after all write-back data for the specified volume is flushed to disk.

`Independent Cache Performance Mode`

Shows the cache redundancy mode for a dual-controller storage system.

- `Disabled`: Controller failover is enabled and data in a controller’s write-back cache is mirrored to the partner controller.
- `Enabled`: The controllers use Independent Cache Performance Mode, in which controller failover is disabled and data in a controller’s write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.

`Missing LUN Response`

Shows whether host drivers may probe for LUNs until the host drivers reach the LUN to which they have access.

- `Not ready`: Sends a reply that there is a LUN where a gap has been created but that it's "not ready." Sense data returned is sensekey = 2, code = 4, qualifier = 3.
- `Illegal`: Sends a reply that there is a LUN but that the request is "illegal." Sense data returned is sensekey = 5, code = 25h, qualifier = 0.

`CompactFlash FailureController Failure`

Shows whether the cache policy will change from write-back to write-through when a controller fails.

- `Disabled`: The controller failure trigger is disabled.
- `Enabled`: The controller failure trigger is enabled.

`Supercap Failure`

Shows whether the cache policy will change from write-back to write-through when the supercapacitor that provides backup power for cache is not fully charged or fails.

- `Disabled`: The supercapacitor failure trigger is disabled.
- `Enabled`: The supercapacitor failure trigger is enabled.

Shows whether the cache policy will change from write-back to write-through when CompactFlash memory is not detected during POST (Power-On Self-Test), fails during POST, or fails during controller operation.

- `Disabled`: The CompactFlash failure trigger is disabled.
- `Enabled`: The CompactFlash failure trigger is enabled.

`Power Supply Failure`

Shows whether the cache policy automatically changes to write-through when a power supply fails.

- `Disabled`: The power-supply failure trigger is disabled.
- `Enabled`: The power-supply failure trigger is enabled.

`Fan Failure`

Shows whether the cache policy will change from write-back to write-through when a fan fails.

- `Disabled`: The fan failure trigger is disabled.
- `Enabled`: The fan failure trigger is enabled.

`Temperature Exceeded`

Shows whether the system will shut down a controller when its temperature exceeds the critical operating range.

- `Disabled`: The over-temperature trigger is disabled.
- `Enabled`: The over-temperature trigger is enabled.

`Partner Notify`

Shows whether the partner controller will be notified when that a trigger condition occurs. .

- `Disabled`: Notification is disabled.
- `Enabled`: Notification is enabled.

`Auto Write Back`

Shows whether the cache mode will change from write-through to write-back when the trigger condition is cleared.

- `Disabled`: Auto-write-back is disabled.
- `Enabled`: Auto-write-back is enabled.

`Inactive Drive Spin Down`

Shows whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the `Inactive Drive Spin Down Delay` field.

- `Disabled`: Drive spin down for available disks and global spares is disabled.
- `Enabled`: Drive spin down for available disks and global spares is enabled.

`Inactive Drive Spin Down Delay`

Shows the period of inactivity in minutes after which spinning disks that are available or are global spares will spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.

`Disk background scrub`

	Shows whether disks that are not in disk groups are automatically checked for disk defects to ensure system health. The interval between background disk scrub finishing and starting again is 72 hours.
	• `Disabled`: Background disk scrub is disabled.
	• `Enabled`: Background disk scrub is enabled.
	`Managed Logs`
	Shows whether the managed logs feature is enabled, which allows log files to be transferred from the storage system to a log collection system to avoid losing diagnostic data as logs fill.
	• `Disabled`: The managed logs feature is disabled.
	• `Enabled`: The managed logs feature is enabled.
	`Single Controller Mode`
	For a system that lacks a second controller module for redundancy and is intended to be used as a single-controller system, this property shows whether the operating/redundancy mode is set to Single Controller. This prevents the system from reporting the absent partner controller as an error condition. This parameter does not affect any other system settings. Installing a second, functional controller module will change the mode to Active-Active ULP.
	• `Enabled`: Single controller mode is enabled.
	• `Disabled`: Single controller mode is disabled.
	`Auto Stall Recovery`
	Shows whether the auto stall recovery is enabled, which detects situations where a controller stall is preventing I/O operations from completing, and recovers the system so that at least one controller is operational, thus avoiding data-unavailability situations. This feature focuses on failover/recovery stalls. When a stall is detected, event 531 is logged.
	• `Disabled`: Auto stall recovery is disabled. The system will constantly perform auto stall detection in the background but will not automatically perform recovery actions.
	• `Enabled`: Auto stall recovery is enabled. The system will constantly perform auto stall detection in the background and automatically perform recovery actions. This is the default.
	`Large pools`
	Shows whether the large-pools feature is enabled. This feature provides the capability to create a virtual pool larger than 512 TiB on each controller by limiting the number of user-defined snapshots that can be created in snapshot trees.
	• `Enabled`: The maximum size for a virtual pool will be 1024 TiB (1 PiB). The maximum number of volumes per snapshot tree will be 9 (base volume plus 8 snapshots).
	• `Disabled`: The maximum size for a virtual pool will be 512 TiB. The maximum number of volumes per snapshot tree will be 255 (base volume plus 254 snapshots).

Examples	Show advanced system-configuration settings. `# show advanced-settings`
Basetypes	advanced-settings-table status
See also	set advanced-settings

show cache-parameters

Description	Shows cache settings and status for the system and optionally for a volume.
Minimum role	monitor
Syntax	`show cache-parameters` `[volume]`
Parameters	`volume`

	Optional. Name or serial number of the volume for which to show settings. A name that includes a space must be enclosed in double quotes. If this parameter is not specified, only system-wide settings are shown.

Output	**System cache parameters:**
	`Operation Mode`
	Shows the system's operating mode, also called the cache redundancy mode:
	• `Independent Cache Performance Mode`: For a dual-controller system, controller failover is disabled and data in a controller's write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.
	• `Active-Active ULP`: Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance.
	• `Single Controller`: The enclosure contains a single controller.
	• `Failed Over`: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy.
	• `Down`: Both controllers are not operational.
	Controller cache parameters:
	`Write Back Status`
	Shows the current, system-wide cache policy as determined by auto-write-through logic. This value is not settable by users. If an auto-write-through trigger condition (such as a CompactFlash failure) is met, the cache policy for all volumes changes to write-through, overriding the volume-specific settings. When the problem is corrected, the cache policy reverts to the value configured for each individual volume.
	• `Enabled`: Write-back. This is the normal state.
	• `Disabled`: Write-through.
	• `Not up`: The controller is not up.
	`CompactFlash Status`
	• `Not Installed`: The CompactFlash card is not installed.
	• `Installed`: The CompactFlash card is installed.
	`CompactFlash Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Cache Flush`
	• `Enabled`: If the controller loses power, it will automatically write cache data to the CompactFlash card. Cache flush is normally enabled, but is temporarily disabled during controller shut down.
	• `Disabled`: Cache flush is disabled.
	Volume cache parameters:
	`Serial Number`
	If a volume is specified, its serial number.
	`Name`
	If a volume is specified, its name.
	`Cache Write Policy`
	If a volume is specified, its cache write policy:
	• `write-back`: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput.

	• `write-through`: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance.
	`Cache Optimization`
	If a volume is specified, its cache optimization mode:
	• `standard`: This controller cache mode of operation is optimized for sequential and random I/O and is the optimization of choice for most workloads. In this mode, the cache is kept coherent with the partner controller. This mode gives you high performance and high redundancy.
	• `no-mirror`: In this mode of operation, the controller cache performs the same as the standard mode with the exception that the cache metadata is not mirrored to the partner. While this improves the response time of write I/O, it comes at the cost of redundancy. If this option is used, the user can expect higher write performance but is exposed to data loss if a controller fails.
	`Read Ahead Size`
	If a volume is specified, its read-ahead cache setting:
	• `Disabled`: Read-ahead is disabled.
	• `Adaptive`: Adaptive read-ahead is enabled, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload.
	• `Stripe`: Read-ahead is set to one stripe. The controllers treat NRAID and RAID-1 disk groups internally as if they have a stripe size of 512 KB, even though they are not striped.
	• 512 KB, 1 MB, 2 MB, 4 MB, 8 MB, 16 MB, or 32 MB: Size selected by a user.

Examples	Show the cache parameters for the system and for volume `V1`. `# show cache-parameters V1`
Basetypes	cache-settings cache-parameter status
See also	set volume-cache-parameters show volumes

show certificate

Description	Shows the status of the system's security certificate.
Minimum role	manage
Syntax	`show certificate` `[a|b|both]`
Parameters	`[a|b|both]` Optional. Specifies whether to show information for controller A, B, or both. If this parameter is omitted, information is shown for both controllers.

Output	Properties are described in alphabetical order.
	`Certificate Status`
	• `Customer-supplied`: The controller is using a certificate that you have uploaded.
	• `System-generated`: The controller is using system-generated certificates.
	• `Unknown status`: The controller's certificate cannot be read. This most often occurs when a controller is restarting or the certificate replacement process is still in process
	`Certificate Text`
	The full text of the certificate.
	`Controller`

	• A: Controller A. • B: Controller B. Time Created The date and time in the format *year-month-day hour:minutes:seconds* when the certificate was created.
Examples	Show certificate status for the system. # show certificate
Basetypes	certificate-status status
See also	create certificate

show chap-records

Description	Shows CHAP records for iSCSI originators. This command is permitted whether or not CHAP is enabled
Minimum role	monitor
Syntax	show chap-records [name *originator-name*] [show-secrets]
Parameters	[name *originator-name*] Optional. The originator name, typically in IQN format. If this parameter is omitted, all CHAP records are shown. [show-secrets] Optional. Minimum role: manage. Shows Initiator Secret and Mutual CHAP Secret values in command output. If this parameter is omitted, secret values are not shown.
Output	Initiator Name The originator name. Initiator Secret The secret that the recipient uses to authenticate the originator. Mutual CHAP Name For mutual CHAP, the recipient name. Mutual CHAP Secret For mutual CHAP, the secret that the originator uses to authenticate the recipient.
Examples	As a user with the monitor role, show the CHAP record for a specific host initiator. # show chap-records name iqn.1991-05.com.microsoft:myhost.domain As a user with the manage role, show the CHAP record for a specific host initiator. # show chap-records name iqn.1991-05.com.microsoft:myhost.domain show-secrets
Basetypes	chap-records status
See also	create chap-record

	delete chap-records set chap-record show iscsi-parameters

show cli-parameters

Description	Shows the current CLI session preferences.
Minimum role	monitor
Syntax	`show cli-parameters`

Output	`Timeout`
	The time in seconds that the session can be idle before it automatically ends. Valid values are 120-43200 seconds (2-720 minutes).
	`Output Format`
	● `console`: Supports interactive use of the CLI by displaying command output in easily readable format. This format automatically sizes fields according to content and adjusts content to window resizes.
	● `api`: Supports scripting by displaying command output in XML. All objects are displayed at the same level, related by COMP elements.
	● `api-embed`: Alternate form of XML output which displays “child” objects embedded (indented) under “parent” objects.
	● `ipa`: Alternate form of XML output which displays as api-embed format with `brief` mode enabled.
	● `json`: Standard JavaScript Object Notation (JSON) output.
	● `wbi`: A JSON-like format used internally by the PowerVault Manager.
	`Brief Mode`
	● `enabled` : In XML output, this setting shows a subset of attributes of object properties. The name and type attributes are always shown.
	● `disabled` : In XML output, this setting shows all attributes of object properties. This is the default.
	`Base`
	● `2`: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude.
	● `10`: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude.
	Operating systems usually show volume size in base 2. Disk drives usually show size in base 10. Memory (RAM and ROM) size is always shown in base 2.
	`Pager`
	● `enabled` : Halts output after each full screen to wait for keyboard input.
	● `disabled` : Output is not halted. When displaying output in API format, which is intended for scripting, disable paging.
	`Locale`
	The display language.
	`Precision #`
	The number of decimal places (1–10) for display of storage-space sizes.
	`Units`
	The unit for display of storage-space sizes:
	● `auto`: Sizes are shown in units determined by the system.
	● `MB`: Sizes are shown in megabytes.
	● `GB`: Sizes are shown in gigabytes.

	• `TB`: Sizes are shown in terabytes.
	Based on the precision setting, if a size is too small to meaningfully display in the selected unit, the system uses a smaller unit for that size. For example, if units is set to TB, precision is set to 1, and base is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.
	`temperature scale`
	• `fahrenheit` or `f`: Temperatures are shown in degrees Fahrenheit.
	• `celsius` or `c`: Temperatures are shown in degrees Celsius. This is the default.
	`Management Mode`
	The management mode used in the current CLI session.
	• `Linear`: Uses linear-storage terminology in command output and system messages. For example, *vdisk*for disk groups and pools.
	• `Virtual`: Uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, *disk group* for disk groups and *pool* for pools.
	To see the default management mode, use the show protocols command.

Examples	Show current CLI settings. `# show cli-parameters`
Basetypes	cli-parameters status
See also	set cli-parameters show protocols

show cloud-iq

Description	Shows the CloudIQ setting.
Minimum role	monitor
Syntax	`show cloud-iq`

Parameters	Shows whether the ability to remotely monitor the system by using the Dell EMC CloudIQ application is enabled or disabled.
	• `Enabled` – Use of the CloudIQ application is enabled.
	• `Disabled` – Use of the CloudIQ application is disabled.
	Specifies the status and date/time of the last transmission of storage system configuration data to the support server.
	`CloudIQ Last Config Send Status`
	`CloudIQ Last Config Send Time`
	Specifies the status and date/time of the last transmission of storage system performance data to the support server.
	`CloudIQ Last Perf Send Status`
	`CloudIQ Last Perf Send Time`

Examples	Show the CloudIQ setting. `# show cloud-iq`
See also	set cloud-iq

show configuration

Description	Shows system configuration information. **NOTE:** Output for this command is lengthy. To control whether the output halts after each full screen to wait for keyboard input, enable or disable the pager parameter of the `set cli-parameters` command.
Minimum role	monitor
Syntax	`show configuration`
Output	• System information from show system • Controller information from show controllers • Controller firmware and hardware version information from show versions with the `detail` parameter • Host and expansion port information from show ports • Disk information from show disks • Disk-slot information from show disks with the `encl` parameter • Vdisk information from show vdisks • Disk-group information from show disk-groups • Pool information from show pools • Enclosure information from show enclosures • Field-replaceable unit (FRU) information from show frus
Examples	Show information about the system configuration. `# show configuration`
Basetypes	system controllers versions port drives enclosure-list virtual-disks disk-groups pools enclosures enclosure-fru status

show controller-date

Description	Shows the system's current date and time.
Minimum role	monitor
Syntax	`show controller-date`

Output	`Controller Date`
	Date and time in the format *`year-month-day hour:minutes:seconds`*
	`Time-Zone Offset`

	The system's time zone as an offset in hours and minutes from Coordinated Universal Time (UTC). This is shown only if NTP is enabled.
Examples	Show the system date and time. `# show controller-date`
Basetypes	time-settings-table status
See also	set controller-date set ntp-parameters show ntp-status

show controllers

Description	Shows information about each controller module.
Minimum role	monitor
Syntax	show controllers

Output	`Controller module ID: A or B.`
	`Serial Number`
	• Serial number.
	• `Not Available`: The controller module is down or not installed.
	`Hardware Version`
	Hardware version.
	`CPLD Version`
	Complex Programmable Logic Device firmware version.
	`MAC Address`
	Network port MAC address.
	`WWNN`
	Storage system World Wide Node Name (WWNN).
	`IP Address`
	Network port IP address.
	`IP Subnet Mask`
	Network port IP subnet mask.
	`IP Gateway`
	Network port gateway IP address.
	`Disks`
	Number of disks in the storage system.
	`Virtual Pools`
	Number of virtual pools in the storage system.
	`Vdisks (v2)`
	`Disk Groups` (v3)
	Number of disk groups in the storage system.
	`System Cache Memory (MB)`

Controller module cache memory size, in MB, including CPU memory available to I/O.

`Host Ports`

Number of host ports in the controller module.

`Disk Channels`

Number of expansion ports in the controller enclosure.

`Disk Bus Type`

Type of interface between the controller module and disks:

- SAS

`Status`

- `Operational`
- `Down`
- `Not Installed`

`Failed Over to This Controller`

Indicates whether the partner controller has failed over to this controller:

- `No`: The partner controller has not failed over to this controller.
- `Yes`: The partner controller has either failed or been shut down, and its responsibilities have been taken over by this controller. There will be a delay between the time that the value of Status becomes Down for one controller and the time that the value of Failed Over to This Controller becomes Yes for the other controller. This time period is the time that it takes for a controller to take over the responsibilities of its partner.

`Fail Over Reason`

If Failed Over to This Controller is Yes, a reason for the failover appears; otherwise, Not applicable appears.

`Multi-core`

Shows whether the controller module is using multiple processing cores.

- `Enabled`: Multiple cores are active.
- `Disabled`: A single core is active.

`Health`

- `OK`
- `Degraded`
- `Fault`
- `N/A`
- `Unknown`

`Health Reason`

If Health is not OK, this field shows the reason for the health state.

`Health Recommendation`

If Health is not OK, this field shows recommended actions to take to resolve the health issue.

`Position`

Position of the controller in the enclosure:

- `Left`: The controller is in the left slot.
- `Right`: The controller is in the right slot.
- `Top`: The controller is in the top slot.
- `Bottom`: The controller is in the bottom slot.

`Phy Isolation`

Shows whether the automatic disabling of SAS expander PHYs having high error counts is enabled or disabled for this controller.

- `Enabled`: PHY fault isolation is enabled.
- `Disabled`: PHY fault isolation is disabled.

	Controller Redundancy Mode Shows the system's operating mode, also called the cache redundancy mode: • `Independent Cache Performance Mode`: For a dual-controller system, controller failover is disabled and data in a controller's write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache • `Active-Active ULP`: Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance. • `Single Controller`: The enclosure contains a single controller. • `Failed Over`: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy. • `Down`: Both controllers are not operational. `Controller Redundancy Status` • `Redundant with independent cache`: Both controllers are operational but are not mirroring their cache metadata to each other. • `Redundant`: Both controllers are operational. • `Operational but not redundant`: In active-active mode, one controller is operational and the other is offline. In single-controller mode, the controller is operational. • `Down`: This controller is not operational. • `Unknown`: Status information is not available.
Examples	Show controller information. `# show controllers`
Basetypes	controllers status
See also	show configuration show frus

show controller-statistics

Description	Shows live performance statistics for controller modules. For controller performance statistics, the system samples live data every 15 seconds. Statistics shown only in API output are described in API basetype properties
Minimum role	monitor
Syntax	`show controller-statistics` `[a|b|both]`
Parameters	`a|b|both` Optional. Specifies whether to show information for controller A, B, or both. If this parameter is omitted, information is shown for both controllers

Output	`Durable ID`
	The controller ID in the format controller_`ID`.
	`CPU Load`
	The percentage of time the CPU is busy, from 0 to 100.
	`Power On Time (Secs)`
	The number of seconds since the controller was restarted.
	`Bps`
	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

	`IOPS`
	The input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`Reads`
	The number of read operations since these statistics were last reset or since the controller was restarted.
	`Writes`
	The number of write operations since these statistics were last reset or since the controller was restarted.
	`Data Read`
	The amount of data read since these statistics were last reset or since the controller was restarted.
	`Data Written`
	The amount of data written since these statistics were last reset or since the controller was restarted.
	`Num Forwarded Cmds`
	The current count of commands that are being forwarded or are queued to be forwarded to the partner controller for processing. This value will be zero if no commands are being forwarded or are queued to be forwarded.
	`Reset Time`
	The date and time, in the format *`year-month-day hour:minutes:seconds`*, when these statistics were last reset, either by a user or by a controller restart.
	The total amount of hours the controller has been powered on in its lifetime.`Total Power On Hours`

Examples	Show statistics for controller A. `# show controller-statistics a`
Basetypes	controller-statistics status
See also	reset all-statistics reset controller-statistics

show disk-groups

Description	Shows information about disk groups. The command will show information for all disk groups by default, or you can use parameters to filter the output.
Minimum role	monitor

Syntax	`show disk-groups`
	`[detail]`
	`[pool` *`pool`*`]`
	`[`*`disk-groups`*`]`

Parameters	`[detail]`
	Optional. This parameter shows additional detail about disk groups.
	`[pool` *`pool`*`]`

	Optional. Specifies the name or serial number of the pool that contains the disk groups for which to show information. If this parameter is omitted, information is shown for disk groups in all pools. `[disk-groups]` Optional. A comma-separated list of the names or serial numbers of the disk groups for which to show information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all disk groups.

Output	Properties are described in alphabetical order.
	`% of Pool`
	Shown by the detail parameter. The percentage of pool capacity that the disk group occupies.
	`Action`
	If Health is not OK, this field shows recommended actions to take to resolve the health issue.
	`Active Drive Spin Down Delay`
	Shown by the detail parameter. For spinning disks in a linear disk group, the period of inactivity after which the disks and dedicated spares will automatically spin down, from 1 to 360 minutes. The value 0 means spin down is disabled. For virtual storage, not applicable.
	`Active Drive Spin Down Enable`
	Shown by the detail parameter.
	● `Disabled`: DSD is disabled for the disk group.
	● `Enabled` - all spinning: DSD is enabled for the disk group.
	● `Partial spin-down`: DSD is enabled for the disk group and its disks are partially spun down to conserve power.
	● `Full spin-down`: DSD is enabled for the disk group and its disks are fully spun down to conserve power.
	`ADAPT Actual Spare Capacity`
	Sown by the detail parameter.
	● For an ADAPT disk group, the actual spare capacity in GiB.
	● For a non-ADAPT disk group, N/A.
	`Blocksize`
	Shown by the `detail` parameter. The size of a block, in bytes.
	`Chunk Size`
	Shown by the `detail` parameter.
	● For RAID levels except NRAID and RAID 1 and RAID 50, the chunk size for the disk group.
	● For NRAID and RAID 1, chunk-size has no meaning and is therefore shown as not applicable (N/A).
	● For RAID 50, the disk-group chunk size calculated as: *configured-chunk-size* x (*subgroup-members* - 1). For a disk group configured to use 64-KB chunk size and 4-disk subgroups, the value would be 192k (64KB x 3).
	`Class`
	Shown by the `detail` parameter.
	● `Linear`: The disk group acts as a linear pool.
	● `Virtual`: The disk group is in a virtual pool.
	`Current Job Completion`
	Shown by the detail parameter. See Job%, below
	`Current Job`
	● `DRSC`: A disk is being scrubbed.
	● `EXPD`: The disk group is being expanded.
	● `INIT`: The disk group is initializing.
	● `RBAL`: The ADAPT disk group is being rebalanced.

- RCON: At least one disk in the disk group is being reconstructed.
- VDRAIN: The virtual disk group is being removed and its data is being drained to another disk group.
- VPREP: The virtual disk group is being prepared for use in a virtual pool.
- VRECV: The virtual disk group is being recovered to restore its membership in the virtual pool.
- VREMV: The disk group and its data are being removed.
- VRFY: The disk group is being verified.
- VRSC: The disk group is being scrubbed.
- Blank if no job is running.

Current Owner

Shown by the detail parameter. See Own, below.

Disks

The number of disks in the disk group.

Free

The amount of free space in the disk group, formatted to use the current base, precision, and units.

Health

- OK
- Degraded
- Fault
- N/A
- Unknown

Health Reason

Shown by the detail parameter. See Reason, below.

Health Recommendation

Shown by the detail parameter. See Action, above.

Job%

- 0%-99%: Percent complete of running job
- Blank if no job is running (job has completed)

Name

The name of the disk group.

Own

Either the preferred owner during normal operation or the partner controller when the preferred owner is offline.

Pool

The name of the pool that contains the disk group.

Preferred Owner

Shown by the detail parameter. Controller that owns the disk group and its volumes during normal operation.

RAID

The RAID level of the disk group.

Reason

If Health is not OK, this field shows the reason for the health state.

Sec Fmt

The sector format of disks in the disk group.

- 512n: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes.

	• 512e: All disks use 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries. • Mixed: The disk group contains a mix of 512n and 512e disks. This is supported, but for consistent and predictable performance, do not mix disks of different sector size types (512n, 512e). Sector Format Shown by the detail parameter. See Sec Fmt, above. Serial Number Shown by the detail parameter. The serial number of the disk group. Size The capacity of the disk group, formatted to use the current base, precision, and units. Spares Shown by the detail parameter. For a linear disk group, the number of spares assigned to the disk group. For a virtual disk group, 0. Status • CRIT: Critical. The disk group is online but isn't fault tolerant because some of its disks are down. • DMGD: Damaged. The disk group is online and fault tolerant, but some of its disks are damaged. • FTDN: Fault tolerant with a down disk. The disk group is online and fault tolerant, but some of its disks are down. • FTOL: Fault tolerant and online. • MSNG: Missing. The disk group is online and fault tolerant, but some of its disks are missing. • OFFL: Offline. Either the disk group is using offline initialization, or its disks are down and data may be lost. • QTCR: Quarantined critical. The disk group is critical with at least one inaccessible disk. For example, two disks are inaccessible in a RAID-6 disk group or one disk is inaccessible for other fault-tolerant RAID levels. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined. • QTDN: Quarantined with a down disk. The RAID-6 disk group has one inaccessible disk. The disk group is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined. • QTOF: Quarantined offline. The disk group is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 disk group. • STOP: The disk group is stopped. • UNKN: Unknown. • UP: Up. The disk group is online and does not have fault-tolerant attributes. Tier • Performance: The disk group is in the highest storage tier, which uses SSDs (high speed). • Standard: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity). • Archive: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • Read Cache: The disk is an SSD providing high-speed read cache for a storage pool.

Examples	Show information about all disk groups.
	`# show disk-groups pool A`
	Show information about disk group dg0002 in pool B.
	`# show disk-groups pool B dg0002`

Basetypes	disk-groups status
See also	show disks show pools

show disk-group-statistics

Description	Shows live performance statistics for disk groups. The command will show information for all disk groups by default, or you can use parameters to filter the output. For disk-group performance statistics, the system samples live data every 30 seconds. Properties shown only in API format are described in API basetype properties.
Minimum role	monitor

Syntax	`show disk-group-statistics`
	`[disk-group` *`disk-group`*`]`
	`[type linear|virtual]`

Parameters	`disk-group disk-group`
	Optional. Specifies the disk group for which to show information. If this parameter is omitted, information will be shown for all disk groups. A value that includes a space must be enclosed in double quotes.
	`type linear|virtual`
	Optional. Specifies whether to show information for linear disk groups or for virtual disk groups. If this parameter is omitted, information will be shown for both types.

Output	`Name`
	The name of the disk group.
	`Time Since Reset`
	The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.
	`Reads`
	Number of read operations since these statistics were last reset or since the controller was restarted.
	`Writes`
	Number of write operations since these statistics were last reset or since the controller was restarted.
	`Data Read`
	Amount of data read since these statistics were last reset or since the controller was restarted.
	`Data Written`
	Amount of data written since these statistics were last reset or since the controller was restarted.
	`Bps`
	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`IOPS`
	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`I/O Resp Time`
	Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.
	`Read Resp Time`
	Average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.
	`Write Resp Time`

	Average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.
	`Pages Allocated per Min`
	Shown for a virtual disk group. The rate, in pages per minute, at which pages are allocated to volumes in the disk group because they need more space to store data.
	`Pages Deallocated per Min`
	Shown for a virtual disk group. The rate, in pages per minute, at which pages are deallocated from volumes in the disk group because they no longer need the space to store data.
	`Pages Reclaimed`
	Shown for a virtual disk group. The number of 4-MB pages that have been automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).
	`Pages Unmapped per Minute`
	Shown for a virtual disk group. The number of 4-MB pages that host systems have unmapped per minute, through use of the SCSI UNMAP command, to free storage space as a result of deleting files or formatting volumes on the host.

Examples	Show live performance statistics for all disk groups.
	`# show disk-group-statistics`
	Show live performance statistics for disk group *dg0001*.
	`# show disk-group-statistics disk-group dg0001`

Basetypes	disk-group-statisticsstatus
See also	reset all-statistics reset disk-group-statistics show disk-groups reset disk-statistics

show disk-parameters

Description	Shows disk settings.
Minimum role	monitor
Syntax	`show disk-parameters`

Output	`SMART`
	Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks.
	• `Detect-Only`: Each disk in the system retains its individual SMART setting, as will new disks added to the system.
	• `Enabled`: SMART is enabled for all disks in the system and will be enabled for new disks added to the system.
	• `Disabled`: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.
	`Drive Write Back Cache`
	• `Disabled`: Disk write-back cache is disabled for all disks in the system and will be disabled for new disks added to the system. This value cannot be changed.
	`Timeout Retry Maximum`
	Maximum number of times a timed-out I/O operation can be retried before the operation is failed. This value cannot be changed.
	`Attempt Timeout`

	Number of seconds before an I/O operation is aborted and possibly retried. This value cannot be changed.
	`Overall Timeout`
	Total time in seconds before an I/O operation is failed regardless of the Attempt Timeout and Timeout Retry Maximum settings. This value cannot be changed.
	`Inactive Drive Spin Down`
	Shows whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the Inactive Drive Spin Down Delay field.
	• `Disabled`: Drive spin down for available disks and global spares is disabled.
	• `Enabled`: Drive spin down for available disks and global spares is enabled.
	`Inactive Drive Spin Down Delay`
	Shows the period of inactivity in minutes after which spinning disks that are available or are global spares will spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.

Examples	Show disk settings. `# show disk-parameters`
Basetypes	drive-parametersstatus
See also	set disk-parameters

show disks

Description	Shows information about all disks or disk slots in the storage system. The command will show information about all installed disks by default, or you can use parameters to filter the output. **NOTE:** In console format, to aid reading, disks are sorted to display in order by enclosure and disk number. In API formats, output is not sorted because it is expected to be manipulated by a host application.
Minimum role	monitor

Syntax	To show information about disks:
	`show disks`
	`[disk-group` *`disk-groups`*`]`
	`[vdisk` *`vdisks`*`]|`
	`[`*`disks`*`] [detail]|[fde]|[perf]|[temp]`
	To show information about disks having specific Usage values:
	`show disks usage available|failed|leftover|pool|spares|unusable`
	To show information about all disk slots:
	`show disks encl`

Parameters	`detail`
	Optional. This parameter shows additional detail about the disk.
	`disk-group` *`disk-groups`*
	Optional. A comma-separated list of the names or serial numbers of disk groups for which to show disk information. A value that includes a space must be enclosed in double quotes.
	`encl`
	Optional. Shows information about each disk slot, whether it contains a disk or not. You cannot use this parameter with any other parameter.
	`fde`

	Optional. For all or specified disks, this option shows Full Disk Encryption information. Information shown includes the FDE state and lock key ID.
	`perf`
	Optional. For all or specified disks, this parameter shows performance statistics from the latest historical sample for each disk. Statistics shown include total I/Os (reads and writes), total amount of data transferred, and average I/O response time.
	`temp`
	Optional. Shows the temperature for all installed disks.
	`vdisk` *`vdisks`*
	Optional. A comma-separated list of the IDs or serial numbers of linear disk groups for which to show disk information. A name that includes a space must be enclosed in double quotes.

Output	`usage available|failed|leftover|pool|spares|unusable`
	Shows information about disks having specific `Usage` values:
	• `available`: Disks whose usage is `AVAIL`.
	• `failed`: Disks whose usage is `FAILED`
	• `leftover`: Disks whose usage is `LEFTOVR`.
	• `pool`: Disks whose usage is `VIRTUAL POOL`. Disks whose usage is `LINEAR POOL` or `VDISK`. Disks whose usage is `LINEAR POOL, VIRTUAL POOL`, or `VDISK`.
	• `spares`: Disks whose usage is `GLOBAL SP`. Disks whose usage is `DEDICATED SP, GLOBAL SP`, or `VDISK SP`. Disks whose usage is `DEDICATED SP, GLOBAL SP`, or `VDISK SP`.
	• `unusable`: Disks whose usage is `UNUSABLE`.
	For explanation of usage values, see the `Usage` property description below. You cannot use this parameter with any other parameter.
	`disks`
	Optional. Either:
	A comma-separated list of the IDs of disks about which to show information. For disk syntax, see Command syntax
	• `all`: Shows information about all installed disks.
	• `free`: Shows information about all disks that are available.
	Properties are described in alphabetical order.
	`Current Job`
	Shown by the `detail` parameter. See `Jobs`, below.
	`Data Transferred`
	Shown by the `perf` parameter. The total number of bytes transferred.
	`Description`
	Shown by default or by the `detail`, `fde`, or `perf` parameter.
	• `SAS`: Enterprise SAS spinning disk.
	• `SAS MDL`: Midline SAS spinning disk.
	• `SSD SAS`: SAS solid-state disk.
	`Disk Group` (v3)
	Shown by default or by the `detail` parameter. The name of the disk group that contains the disk.
	`Drawer ID`
	Shown by the detail parameter. The ID of the drawer containing the disk.
	`Drive Spin Down Count`
	Shown by the `detail` parameter. The number of times the DSD feature has spun down this disk.
	`Encl`
	Shown by the `encl` parameter. The number of the enclosure where the disk is located.

`FDE State`

Shown by the detail or `fde` parameter. The FDE state of the disk:

- `Unknown`: The FDE state is unknown.
- `Not FDE Capable`: The disk is not FDE-capable.
- `Not Secured`: The disk is not secured.
- `Secured, Unlocked`: The system is secured and the disk is unlocked.
- `Secured, Locked`: The system is secured and the disk is locked to data access, preventing its use.
- `FDE Protocol Failure`: A temporary state that can occur while the system is securing the disk.

`Health`

Shown by default or by the `detail`, `fde`, or `perf` parameter.

- `OK`
- `Degraded`
- `Fault`
- `N/A`
- `Unknown`

`Health Reason`

Shown by the `detail` parameter. If Health is not OK, this field shows the reason for the health state.

`Health Recommendation`

Shown by the `detail` parameter. If Health is not OK, this field shows recommended actions to take to resolve the health issue.

`I/O Resp Time`

Shown by the `perf` parameter. The average time in microseconds to complete I/O.

`Jobs`

Shown by default.

- `DRSC`: The disk is being scrubbed.
- `EXPD`: The disk group is being expanded.
- `INIT`: The disk group is being initialized.
- `RBAL`: The ADAPT disk group is being rebalanced.
- `RCON`: The disk is being used in a reconstruct operation.
- `VDRAIN`: The virtual disk group is being removed and its data is being drained to another disk group.
- `VPREP`: The virtual disk group is being prepared for use in a virtual pool.
- `VRECV`: The virtual disk group is being recovered to restore its membership in the virtual pool.
- `VREMV`: The disk group and its data are being removed.
- `VRFY`: The disk group is being verified.
- `VRSC`: The disk group is being scrubbed.
- Blank if no job is running.

`LED Status`

Shown by the `detail` parameter. The disk LED status:

- `Rebuild`: The disk's disk group is being reconstructed.
- `Fault`: The disk has a fault.
- `ID`: The disk's identification LED is illuminated.
- `Remove`: The disk is ready to be removed from the enclosure.
- Blank if the disk is not part of a disk group or is spun down.

`Location`

Shown by `default` and by any parameter except `encl`. The disk location in the format *enclosure-ID.slot-number*.

`Lock Key ID`

Shown by the `fde` parameter. The current lock key ID.

`Model`

Shown by the `encl` parameter. The model number of the disk.

`Pool`

Shown by default. The name of the pool that contains the disk.

`Pool Name`

Shown by the detail parameter. See `Pool`, above.

`Power On Hours`

Shown by the `detail` parameter. The total number of hours that the disk has been powered on since it was manufactured. This value is stored in disk metadata and is updated in 30-minute increments.

`Recon State`

Shown by the detail parameter. The state of the disk (source or destination) if it is involved in a reconstruct operation.

- `From`: This disk is being used as the source of a reconstruct operation.
- `To`: This disk is being used as the target of a reconstruct operation.
- `N/A`: This disk is not being used in a reconstruct operation.

`Rev`

Shown by default or by the `detail`, `fde`, or `perf` parameter. The firmware revision number.

`Revision`

Shown by the `detail` parameter. See `Rev`, above.

`Sec Fmt`

Shown by default or by the `detail` or `perf` parameter. The disk sector format.

- `512n`: The disk uses 512-byte native sector size. Each logical block and physical block is 512 bytes.
- `512e`: The disk uses 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.

`Serial Number`

Shown by default and by any parameter except `temp`. The serial number of the disk.

`Single Pathed`

Shown by the `detail` parameter:

- `A` or `B`: A dual-ported disk is communicating through a single port to the connected controller. A failure is preventing communication through the second port to the other controller.
- (blank): The disk is operating normally.

NOTE: ME4 Series systems support only dual-ported disks.

`Size`

Shown by `default` and by any parameter except `fde` or `temp`. The disk capacity, formatted to use the current base, precision, and units.

`Slot`

Shown by the `encl` parameter. The slot number in the enclosure where the disk is located.

`SMART`

Shown by the `detail` parameter. Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks.

- `Detect-Only`: Each disk in the system retains its individual SMART setting, as will new disks added to the system.

- `Enabled`: SMART is enabled for all disks in the system and will be enabled for new disks added to the system.
- `Disabled`: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.

`Speed (kr/min)`

Shown by `default`, `detail`, `fde`, or `perf` parameter. The speed of a spinning disk, in thousands of revolutions per minute, as specified by the disk vendor. For an SSD, 0 is shown.

`SSD Life Remaining%`

Shown by the `detail` parameter.

- 100%–0%: For an SSD, this field shows the percentage of disk life remaining. This value is polled every 5 minutes. When the value decreases to 20%, event 502 is logged with Informational severity. Event 502 is logged again with Warning severity when the value decreases to 5%, 2% or 1%, and 0%. If a disk crosses more than one percentage threshold during a polling period, only the lowest percentage will be reported.
- `N/A`: The disk is not an SSD.

`Status`

Shown by the `encl` parameter.

- `Up`: The disk is present and is properly communicating with the expander.
- `Spun Down`: The disk is present and has been spun down by the drive spin down feature.
- `Warning`: The disk is present but the system is having communication problems with the disk LED processor. For disk and midplane types where this processor also controls power to the disk, power-on failure will result in `Error` status.
- `Error`: The disk is present but is not detected by the expander.
- `Unknown`: Initial status when the disk is first detected or powered on.
- `Not Present`: The disk slot indicates that no disk is present.
- `Unrecoverable`: The disk is present but has unrecoverable errors.
- `Unavailable`: The disk is present but cannot communicate with the expander.
- `Unsupported`: The disk is present but is an unsupported type.

`Temperature`

Shown by the `detail` or `temp` parameter. The temperature of the disk.

`Temperature Status`

Shown by the `temp` parameter.

- `OK`: The disk sensor is present and detects no error condition.
- `Warning`: The disk sensor detected a non-critical error condition. The temperature is between the warning and critical thresholds.
- `Critical`: The disk sensor detected a critical error condition. The temperature currently exceeds the critical threshold.
- `Unknown`: The disk sensor is present but status is not available.

`Tier`

Shown by default or by the `detail` parameter.

- `Performance`: The disk is in the highest storage tier, which uses SSDs (high speed).
  - `Standard`: The disk is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).
  - `Archive`: The disk is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity).
  - `Read Cache`: The disk is an SSD providing high-speed read cache for a storage pool.

`Total I/Os`

Shown by the `perf` parameter. The total number of I/O operations (reads and writes).

`Transfer Rate`

Shown by the `detail` parameter. The data transfer rate in Gbit/s. A footnote indicates that it is normal behavior for the rate to vary. ome 6-Gbit/s disks might not consistently support a 6-Gbit/s

	transfer rate. If this happens, the controller automatically adjusts transfers to those disks to 3 Gbit/s, increasing reliability and reducing error messages with little impact on system performance. This rate adjustment persists until the controller is restarted or power-cycled.
	`Usage`
	Shown by `default` or by the `detail` parameter.
	● `AVAIL`: Available.
	● `DEDICATED SP`: The disk is a spare assigned to a linear disk group.
	● `FAILED`: The disk is unusable and must be replaced. Reasons for this status include: excessive media errors, SMART error, disk hardware failure, or unsupported disk.
	● `GLOBAL SP`: The disk is a global spare.
	● `LEFTOVR`: The disk is a leftover.
	● `LINEAR POOL`: The disk is a member of a linear disk group.
	● `UNUSABLE`: The disk cannot be used in a disk group. Possible reasons include:
	  ○ The system is secured and the disk is data locked with a different passphrase.
	  ○ The system is secured/locked (no passphrase available) and the disk is data/locked.
	  ○ The system is secured and the disk is not FDE capable.
	● `UNUSABLE`: The disk cannot be used in a disk group because the disk is from an unsupported vendor.
	● `VDISK`: The disk is a member of a linear disk group.
	● `VDISK SP`: The disk is a spare assigned to a linear disk group
	● `VIRTUAL POOL`: The disk is a member of a disk group in a virtual pool.
	`Vdisk (v2)`
	Shown by default or by the `detail` parameter. The name of the disk group that contains the disk.
	`Vendor`
	Shown by default and by any parameter except `temp`. The vendor of the disk.

Examples	Show disk information.
	`# show disks`
	Show disk-slot information.
	`# show disks encl`
	Show disk performance statistics.
	`# show disks perf`
	Show Full Disk Encryption information.
	`# show disks fde`
	Show disk temperature information.
	`# show disks temp`
	Show detailed information for disk 1.1:
	`# show disks 1.1 detail`
	Show information about available disks only:
	`# show disks usage available`

Basetypes	drives enclosure-list status
See also	show disk-groups show vdisks

show disk-statistics

Description	Shows live or historical performance statistics for disks. For disk performance statistics, the system samples live data every 15 seconds and historical data every quarter hour, and retains historical data for 6 months. The historical option allows you to specify a time range or a number (count) of data samples to include. It is not recommended to specify both the time-range and count parameters. If both parameters are specified, and more samples exist for the specified time range, the samples' values will be aggregated to show the required number of samples. Statistics shown only in API output are described in API basetype properties.
Minimum role	monitor

Syntax	To show live statistics:
	`show disk-statistics`
	`[error-stats]`
	`[disks]`
	To show historical statistics:
	`show disk-statistics [all]`
	`[count number-of-data-samples]`
	`[filename filename.csv]`
	`historical`
	`[time-range "date/time-range"]`
	`disks`

Parameters	`all`
	Optional. Specifies to show the full set of performance metrics. If this parameter is omitted, the default set of performance metrics will be shown.
	`count number-of-data-samples`
	Optional. Specifies the number of data samples to display, from 1 to 100. Each sample will be shown as a separate row in the command output. If this parameter is omitted, 100 samples will be shown. If you specify this parameter, do not specify the `time-range` parameter.
	`error-stats`
	Optional. Specifies to show live error statistics for all disks or specified disks. If you specify this parameter, do not specify the `all`, `count`, `historical`, or `time-range` parameters.
	`filename filename.csv`
	Optional. Specifies to save historical statistics, in CSV format, to a file on the controller. To access the file, use SFTP or FTP.
	`historical`
	Optional. Specifies to show historical statistics. If this parameter is omitted, live statistics will be shown.
	`time-range "date/time-range"`
	Optional. Specifies the date/time range of historical statistics to show, in the format "`start yyyy-mm-dd hh:mm [AM| PM] end yyyy-mm-dd hh:mm [AM|PM]`". If the start date/time is specified but no end date/time is specified, the current date/time will be used as the end date/time. The system will return the oldest sample taken after the start time and the latest sample taken before the end time. If the specified start date/time is earlier than the oldest sample, that sample will be used as the start date/time. If you specify this parameter, do not specify the `count` parameter. If this parameter is omitted, the most recent 100 data samples will be displayed.
	disks

	Optional for live statistics. Required for historical statistics. Specifies a comma-separated list of disks for which to show information. If this parameter is omitted, information will be shown for all disks. For disk syntax, see Command syntax

Output	**Live**
	`Location`
	The disk location in the format disk_*enclosure-ID.slot-number*.
	`Serial Number`
	The serial number of the disk.
	`Pwr Hrs`
	The total number of hours that the disk has been powered on since it was manufactured. This value is stored in disk metadata and is updated in 30-minute increments.
	`Bps`
	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`IOPS`
	The number of input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`Reads`
	The number of read operations since these statistics were last reset or since the controller was restarted.
	`Writes`
	The number of write operations since these statistics were last reset or since the controller was restarted.
	`Data Read`
	The amount of data read since these statistics were last reset or since the controller was restarted.
	`Data Written`
	The amount of data written since these statistics were last reset or since the controller was restarted.
	`Lifetime Read`
	The amount of data read from the disk in its lifetime.
	`Lifetime Written`
	The amount of data written to the disk in its lifetime.
	`Reset Time`
	Date and time, in the format *year-month-day hour:minutes:seconds* , when these statistics were last reset, either by a user or by a controller restart.
	Live, error-stats
	`Location`
	The disk location in the format disk_*enclosure-ID.slot-number*.
	`Serial Number`
	The serial number of the disk.
	`SMART port#`
	The number of SMART events recorded.
	`Time port#`
	The number of timeouts accessing the disk.

	`NResp port#`
	The number of times the disk did not respond.
	`Spin port#`
	The number of attempts by the storage system to spin up the disk.
	`Med port#`
	The number of media errors generated by the disk, as specified by its manufacturer.
	`NMed port#`
	The number of other errors generated by the storage system, or generated by the disk and not categorized as media errors.
	`BAsgn port#`
	The number of times blocks were reassigned to alternate locations.
	`BBlk port#`
	The number of bad blocks encountered.
	Historical
	`Durable ID`
	The disk ID in the format disk_*enclosure-number.disk-number*.
	`Serial Number`
	The serial number of the disk.
	`Total I/Os`
	The total number of read and write operations since the last sampling time.
	`Reads`
	Shown by the all parameter. The number of read operations since the last sampling time.
	`Writes`
	Shown by the all parameter. The number of write operations since the last sampling time.
	`Data Transferred`
	The total amount of data read and written since the last sampling time.
	`Data Read`
	Shown by the all parameter. The amount of data read since the last sampling time.
	`Data Written`
	Shown by the all parameter. The amount of data written since the last sampling time.
	`Total IOPS`
	The total number of read and write operations per second since the last sampling time.
	`Read IOPS`
	Shown by the all parameter. The number of read operations per second since the last sampling time.
	`Write IOPS`
	Shown by the all parameter. The number of write operations per second since the last sampling time.
	`Total B/s`
	The total data transfer rate, in bytes per second, since the last sampling time.
	`Read B/s`
	Shown by the all parameter. The data transfer rate, in bytes per second, for read operations since the last sampling time.
	`Write B/s`
	Shown by the all parameter. The data transfer rate, in bytes per second, for write operations since the last sampling time.

	`Queue Depth`
	Shown by the all parameter. The average number of pending read and write operations being serviced since the last sampling time. This value represents periods of activity only and excludes periods of inactivity.
	`I/O Resp Time`
	The average response time, in microseconds, for read and write operations since the last sampling time.
	`Read Resp Time`
	Shown by the all parameter. The average response time, in microseconds, for read operations since the last sampling time.
	`Write Resp Time`
	Shown by the all parameter. The average response time, in microseconds, for write operations since the last sampling time.
	`Average I/O Size`
	Shown by the all parameter. The average data size of read and write operations since the last sampling time.
	`Average Read I/O Size`
	Shown by the all parameter. The average data size of read operations since the last sampling time.
	`Average Write I/O Size`
	Shown by the all parameter. The average data size of write operations since the last sampling time.
	`Number of Disk Errors`
	Shown by the all parameter. The total number of disk errors detected since the last sampling time. Error types include: number of SMART events; number of timeouts accessing the disk; number of times the disk did not respond; number of attempts by the storage system to spin-up the disk; media errors generated by the disk as specified by its manufacturer; non-media errors (generated by the storage system, or by the disk and not categorized as media errors); number of bad-block reassignments.
	`Sample Time`
	Date and time, in the format *year-month-day hour:minutes:seconds*, when the data sample was taken

Examples	Show live statistics for disks 1.1 and 2.1.
	`# show disk-statistics 1.1,2.1`
	Show live error statistics for all disks.
	`# show disk-statistics error-stats`
	Show historical statistics from a specified date and time range for disk *1.5*.
	`# show disk-statistics 1.5 historical time-range "start 2011-12-05 4:40 PM end 2011-12-05 5:00 PM"`
	Show all samples of historical statistics for disk *1.5*.
	`# show disk-statistics 1.5 historical all`

Basetypes	disk-statistics (live) drive-summary (historical) status
See also	reset all-statistics reset disk-error-statistics reset disk-statistics show disk-group-statistics show disks

show dns-management-hostname

Description	Shows the management host name for each controller module. If DNS server functionality is operational and reachable by the nslookup service on the controller, the FQDN for each controller is also shown. If nslookup output is not available, the domain name will show '-'.
Minimum role	monitor
Syntax	`show dns-management-hostname`

Output	`Controller`
	The controller ID: `A` or `B`.
	`DNS management-hostname`
	The management host name of the controller.
	`Domain Name (DNS)`
	The FQDN of the controller or '-'.

Examples	Show the management host name for each controller module. `# show dns-management-hostname`
Basetypes	mgmt-hostnames status
See also	clear dns-parameters set dns-managment-hostname reset dns-management-hostname set dns-parameters show dns-parameters

show dns-parameters

Description	Shows configured DNS settings for each controller module.
Minimum role	monitor
Syntax	`show dns-parameters`

Output	`Controller`
	The controller ID: A or B.
	`Name Servers`
	Configured name server IP address values.
	`Search Domains`
	Configured domain name values

Examples	Show the system's DNS settings. `# show dns-parameters`
Basetypes	controller-dns-parameters dns-parameters status

See also	clear dns-parameters set dns-parameters set email-parameters show email-parameters

show email-parameters

Description	Shows email (SMTP) notification parameters for events and managed logs.
Minimum role	monitor
Syntax	`show email-parameters`

Output	`Email Notification`
	• `Disabled`: Email notification is disabled.
	• `Enabled`: Email notification is enabled.
	`Email Notification Filter`
	Shows the minimum severity for which the system should send notifications:
	• `crit`: Sends notifications for Critical events only.
	• `error`: Sends notifications for Error and Critical events.
	• `warn`: Sends notifications for Warning, Error, and Critical events.
	• `resolved`: Sends notifications for Resolved, Warning, Error, and Critical events.
	• `info`: Sends notifications for all events.
	• `none`: Disables email notification. This is the default. If this option is specified, no other parameters are required and their current values are not changed.
	This parameter does not apply to managed-logs .
	`Email Address (1-3)`
	Shows up to three email addresses for recipients of event notifications.
	`Log Destination`
	Shows the email address for the log collection system used by the managed logs feature
	`Security Protocol`
	• `tls`: Enables Transport Layer Security (TLS) authentication. The standard ports for TLS are 25 or 587.
	• `ssl`: Enables Secure Sockets Layer (SSL) authentication. The standard port for SSL is 465.
	• `none`: Do not use a security protocol. The standard port is 25. This setting is the system default.
	`Server Port`The port on which the configured SMTP server is listening. This is either automatically configured to a default setting by the system, or has been overridden by the user.
	`Email Server`
	The IP address or domain name of the SMTP mail server to use for the email messages.
	`Email Domain`
	The domain name that, with the sender name, forms the “from” address for remote notification.
	`Email Sender`
	The sender name that, with the domain name, forms the “from” address for remote notification.
	`Email Sender Password`
	The sender password. For a configured sender, the password is represented by eight asterisks
	`Include Logs`
	Shows whether system log files will automatically be attached to email notification messages generated by the managed logs feature. This is the “push” mode for managed logs

Examples	Show settings for email notification. `# show email-parameters`
Basetypes	email-parameters status
See also	set dns-parameters set email-parameters show dns-parameters

show enclosures

Description	Shows information about the enclosures in the storage system. Full detail available in API output only. If a connected expansion enclosure is not supported, it will not be listed and events 315 and 443 will be logged.
Minimum role	monitor
Syntax	`show enclosures`

Parameters	`Encl`
	The enclosure ID.
	`Encl WWN`
	The enclosure WWN.
	`Name`
	The enclosure name.
	`Location`
	The enclosure location, or blank if not set.
	`Rack`
	The number of the rack that contains the enclosure.
	`Pos`
	The position of the enclosure in the rack
	`Vendor`
	The enclosure vendor.
	`Model`
	The enclosure model.
	`EMP` *`controller-ID`* `BUS:ID Rev`
	The channel ID and firmware revision of the Enclosure Management Processor in each controller's Expander Controller.
	`Midplane Type`
	An abbreviation that describes the enclosure midplane's rack-unit height, maximum number of disks, maximum data rate to disks (Gbit/s), and hardware version.
	`Health`
	• Show information about all enclosures in the system.
	# show enclosures
	`OK`
	• `Degraded`

	• Fault • N/A • Unknown Reason If Health is not OK, this field shows the reason for the health state. Action If Health is not OK, this field shows recommended actions to take to resolve the health issue. **Drawer Information** Drawer The number of the drawer. Name The name of the drawer. Status Status of the drawer • Up • Warning • Error • Unknown • Unavailable • Not Present Health • OK • Degraded • Fault • N/A • Unknown Reason If Health is not OK, this field shows the reason for the health state. Action If Health is not OK, this field shows recommended actions to take to resolve the health issue.
Examples	Show information about all enclosures in the system. # show enclosures
Basetypes	enclosures status
See also	set enclosure show sensor-status

show events

Description	Shows events logged by each controller in the storage system. A separate set of event numbers is maintained for each controller. Each event number is prefixed with a letter identifying the controller that logged the event. Events are listed from newest to oldest, based on a timestamp with one-second granularity. Therefore the event log sequence matches the actual event sequence within about one second.

Minimum role	monitor

Syntax	`show events [a|b|both|error]`
	`[detail]`
	`[from timestamp]`
	`[from-event event-ID]`
	`[last #]`
	`[logs yes|no]`
	`[to timestamp]`
	`[to-event event-ID]`

Parameters	`a|b|both|error`
	Optional. Specifies to filter the event listing:
	● `a`: Shows events from controller A only. Do not use this parameter with the `from-event` parameter or the `to-event` parameter.
	● `b`: Shows events from controller B only. Do not use this parameter with the `from-event` parameter or the `to-event` parameter.
	● both: Shows events from both controllers. Do not use this parameter with the `from-event` parameter or the `to-event` parameter.
	● `error`: Shows Warning, Error, and Critical events, but not Informational or Resolved events.
	`detail`
	Optional. Shows additional information and recommended actions for displayed events.
	`from timestamp`
	Optional. Shows events that occurred on or after a timestamp specified with the format *MMDDYYhhmmss*. For example, 043011235900 represents April 30 2011 at 11:59:00 p.m. This parameter can be used with the `to` parameter or the `to-event` parameter.
	`from-event event-ID`
	Optional. Shows events including and after the specified event ID. If this number is smaller than the ID of the oldest event, events are shown from the oldest available event. Events are shown only for the controller that the event ID specifies (A or B). This parameter can be used with the `to` parameter or the `to-event` parameter.
	`last #`
	Optional. Shows the latest specified number of events. If this parameter is omitted, all events are shown.
	`logs yes|no`
	Optional.
	● `no`: Lists events as described in the Output section, below. This is the default.
	● `yes`: Shows events in tabular format, with columns for event ID, date and time, event code, severity, and message.
	`to timestamp`
	Optional. Shows events that occurred on or before a timestamp specified with the format *MMDDYYhhmmss*. For example, 043011235900 represents April 30 2011 at 11:59:00 p.m. This parameter can be used with the `from` parameter or the `from-event` parameter.
	`to-event event-ID`
	Optional. Shows events before and including the specified event ID. If this number is larger than the ID of the oldest event, events are shown up to the latest event. Events are shown only for the controller that the event ID specifies (A or B). This parameter can be used with the `from` parameter or the `from-event` parameter.

Output	● Date and time when the event was logged. ● Event code identifying the type of event to help diagnose problems. For example: `[3]`

	• Event ID prefixed by A or B, indicating which controller logged the event. For example: `#A123`
	• Model, serial number, and ID of the controller module that logged the event.
	• Severity:
	  ○ `CRITICAL`: A failure occurred that may cause a controller to shut down. Correct the problem *immediately*.
	  ○ `ERROR`: A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible.
	  ○ `WARNING`: A problem occurred that may affect system stability but not data integrity. Evaluate the problem and correct it if necessary.
	  ○ `INFORMATIONAL`: A configuration or state change occurred, or a problem occurred that the system corrected. No action is required.
	  ○ `RESOLVED`: A condition that caused an event to be logged has been resolved.
	• Event-specific message giving details about the event.

Examples	Show the last two events.
	`# show events last 2`
	Show the last three non-Informational events.
	`# show events last 3 error`
	Show all events from April 30 2014 at 11:59:00 p.m. through May 2 2014 at 11:59:00 a.m.
	`# show events from 043014235900 to 050214115900`
	Show a range of events logged by controller A.
	`# show events from-event a100 to-event a123`
	Show detailed output for a specific event.
	`# show events from-event A2264 to-event A2264 detail`

Basetypes	events eventsLogs status
See also	clear events set snmp-parameters show snmp-parameters

show expander-status

Description	Shows diagnostic information relating to SAS Expander Controller physical channels, known as PHY lanes. **NOTE:** This command is for use by or with direction from technical support. For each enclosure, this command shows status information for PHYs in I/O module A and then I/O module B
Minimum role	monitor
Syntax	`show expander-status`

Output	`Encl`
	The enclosure that contains the SAS Expander.
	`Drawer`
	Shown in drawer output. The number of the drawer.
	`Expander`
	Shown in drawer output. The number of the Expander.

`Ctlr`

The I/O module that contains the SAS Expander.

`Phy`

Identifies the logical location of a PHY within a group based on the PHY type. If the controller module or expansion module for the PHY is not installed, this field shows "--".

`phy phy-ID`

The logical PHY number.

`Type:`

- Drawer0-Egress: Drawer 0 egress PHY
- Drawer0-Ingress-0: Drawer 0 ingress PHY 0
- Drawer1-Egress: Drawer 1 egress PHY
- Drawer1-Ingress: Drawer 1 drawer ingress PHY
- Drawer2-Egress: Drawer 2 egress PHY
- Drawer2-Ingress: Drawer 2 ingress PHY
- Drive: Drive slot PHY
- Egress: Expansion port egress PHY
- Expander-Egress-0: Expansion port 0 egress PHY
- Expander-Egress-1: Expansion port 1 egress PHY
- Expander-Ingress-0: Expansion port 0 ingress PHY
- Expander-Ingress-1: Expansion port 1 ingress PHY
- Ingress: Expansion port ingress PHY
- Inter-Exp: Inter-Expander PHY
- SC: Storage Controller PHY
- SC-0: Storage Controller primary PHY
- SC-1: Storage Controller alternate PHY
- SC-a: Storage Controller alternate PHY
- SC-p: Storage Controller primary PHY
- SCA-A: Storage Controller A alternate PHY
- SCA-P: Storage Controller A primary PHY
- SCB-A: Storage Controller B alternate PHY
- SCB-P: Storage Controller B primary PHY

`Status`

- `Enabled - Healthy`: The PHY is enabled and healthy.
- `Enabled - Degraded`: The PHY is enabled but degraded.
- `Disabled`: The PHY has been disabled by a user or by the system

`Elem Status`

A standard SES status for the element:

- `Disabled`: Critical condition is detected.
- `Error`: Unrecoverable condition is detected. Appears only if there is a firmware problem related to PHY definition data.
- `Non-critical`: Non-critical condition is detected.
- `Not Used`: Element is not installed in enclosure.
- `OK`: Element is installed and no error conditions are known.
- `Unknown`: Either:
  - Sensor has failed or element status is not available. Appears only if an I/O module indicates it has fewer PHYs than the reporting I/O module, in which case all additional PHYs are reported as unknown.
  - Element is installed with no known errors, but the element has not been turned on or set into operation.

`Disabled`

- `Enabled`: PHY is enabled.
- `Disabled`: PHY is disabled.

`Reason`

	• Blank if `Elem Status` is `OK`. • `Error count interrupts`: PHY disabled because of error-count interrupts. • `Phy control`: PHY disabled by a SES control page as a result of action by a Storage Controller or user. • `Not ready`: PHY is enabled but not ready. Appears for SC-1 PHYs when the partner I/O module is not installed. Appears for Drive, SC-1, or Ingress PHYs when a connection problem exists such as a broken connector. • `Firmware reboot`. • `Drive removed`: PHY disabled because drive slot is empty. • `Unused - disabled by default`: PHY is disabled by default because it is not used. • `Excessive Phy changes`: PHY is disabled because of excessive PHY change counts. • `Did not initialize`
Examples	Show expander status for each enclosure. `# show expander-status`
Basetypes	sas-status-controller-a sas-status-drawer status
See also	clear expander-status set expander-fault-isolation

show fan-modules

Description	Shows information about each fan module in the storage system. To see information about both fans in each fan module, use the show fans command
Minimum role	monitor
Syntax	`show fan-modules`

Output	`Encl`
	The ID of the enclosure that contains the fan module.
	`Id`
	The fan module position, shown as an index value that starts at 0 and increments from left to right as viewed from the back of the enclosure.
	`Name`
	The name of the fan module in the format Fan Module *ID*.
	`Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Reason`
	If Health is not OK, this field shows the reason for the health state.
	`Action`
	If Health is not OK, this field shows recommended actions to take to resolve the health issue

Examples	Show about all fan modules in the system.

	`# show fan-modules`
Basetypes	fan-modules status
See also	show fans show power-supplies

show fans

Description	Shows information about each fan in the storage system. To see information about the fan modules that contain each pair of fans, use the show fan-modules command.
Minimum role	monitor
Syntax	`show fans`

Output	`Name`
	The fan name.
	`Location`
	The fan location in the format Enclosure *enclosure-ID- position*. The position is as viewed from the back of the enclosure.
	`Status`
	• `Up`
	• `Error`
	• `Off`
	• `Missing`
	`Speed`
	The fan speed (revolutions per minute).
	`Position`
	The fan position, as viewed from the back of the enclosure:
	• `Left`
	• `Right`
	• `N/A`
	`Serial Number`
	• (blank): Not applicable.
	`Part Number`
	• (blank): Not applicable.
	`Firmware version`
	• (blank): Not applicable.
	• The firmware revision of a fan FRU.
	`Hardware version`
	• (blank): Not applicable.
	`Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`

	• Unknown Reason If Health is not OK, this field shows the reason for the health state. Action If Health is not OK, this field shows recommended actions to take to resolve the health issue
Examples	Show about all fans in the system. # show fans
Basetypes	fan status
See also	show power-supplies

show fde-state

Description	Shows Full Disk Encryption information for the storage system. **NOTE:** If you insert an FDE disk into a secured system and the disk does not come up in the expected state, perform a manual rescan by using the rescan command.
Minimum role	monitor
Syntax	show fde-state
Output	FDE Security Status • Unsecured. The system has not been secured with a passphrase. • Secured. The system has been secured with a passphrase. • Secured, Lock Ready. The system has been secured and lock keys have been cleared. The system will become locked after the next power cycle. • Secured, Locked. The system is secured and the disks are locked to data access, preventing their use. Lock Key ID The current lock ID is displayed. Import Key ID The previous or import lock ID is displayed. FDE Configuration Time If the system is secured, the time at which the current lock ID was set.
Examples	Show FDE information. # show fde-state
Basetypes	fde-state status
See also	clear fde-keys set fde-import-key set fde-lock-key set fde-state

show fenced-data

Description	Shows information about fenced data blocks in the storage system. The command will show information for all fenced blocks by default, or you can use parameters to filter the output. Fenced data blocks are blocks of data on disk which, for either of the following reasons, cannot be recovered and have been lost: • Typically, fenced data occurs when a disk in a non-fault-tolerant disk group detects an unrecoverable media error. • Fenced data can also occur if multiple unrecoverable blocks are detected which exceed the capacity of the RAID error-recovery algorithms. Unrecoverable data blocks are "fenced" by marking them unreadable by the storage system. A data block remains fenced until the host writes the block, at which time it is again accessible. For NRAID and RAID 0, fenced data is not tracked. Errors are returned directly during host reads. For RAID 1 and 10, fenced blocks correspond with the data blocks where unrecoverable errors are detected, normally when a disk group is not fault tolerant and the remaining good disk has a media error. For RAID 3, 5, 6, 50 for linear storage or 5, 6, and ADAPT for virtual storage, a single unrecoverable error detected while not fault tolerant can result in two or more blocks being fenced. This is because each parity block protects multiple data blocks. Thus, for RAID 3, 5, and 50, if a block returns an unrecovered error during reconstruction, that block is lost (because it cannot be read). The block being reconstructed is also lost because there is not enough information to reconstruct the data for that block. RAID 6 and ADAPT will similarly mark multiple bad blocks if a combination of failed disks and media errors results in unrecoverable data. When the controller module fences data, it logs events 542 and 543.
Minimum role	monitor

Syntax	`show fenced-data [all]`
	`[disk-groups` *`disk-groups`*`]`
	`[vdisks` *`vdisks`*`]`
	`[volumes` *`volumes`*`]`

Parameters	`all`
	Optional. Shows information about all fenced data blocks.
	`[disk-groups` *`disk-groups`*`]`
	Optional. The names or serial numbers of disk groups for which to show fenced data block information. A name that includes a space must be enclosed in double quotes.
	`[vdisks` *`vdisks`*`]`
	Optional. The names or serial numbers of disk groups for which to show fenced data block information. A name that includes a space must be enclosed in double quotes.
	`[volumes` *`volumes`*`]`
	Optional for linear storage. The names or serial numbers of linear volumes for which to show fenced data block information. A name that includes a space must be enclosed in double quotes.

Output	`Volume Name`
	The volume name for which fenced data is reported.
	`Volume Serial Number`
	The volume serial number for which fenced data is reported.
	`Volume LBA`
	The LBA in the volume at which fenced data is reported.
	`Vdisk Name`

	The name of the disk group for which fenced data is reported.
	`Vdisk Serial Number`
	The serial number of the disk group for which fenced data is reported.
	`Vdisk LBA`
	The LBA in the disk group at which fenced data is reported.

Examples	Show information about fenced data blocks for all volumes. `# show fenced-data all`
Basetypes	fenced-data status
See also	show disk-groups show events show vdisks show volumes

show frus

Description	Shows FRU (field-replaceable unit) information for the storage system. Some information is for use by service technicians.
Minimum role	monitor
Syntax	`show frus`
Output	`Enclosure ID` The enclosure ID.

Examples	**FRU fields:**
	`Name`
	• `CHASSIS_MIDPLANE`: Chassis and midplane circuit board
	• `RAID_IOM`: Controller module
	• `BOD_IOM`: Expansion module
	• `POWER_SUPPLY`: Power supply module
	• `DRAWER`: Enclosure disk drawer
	• `FAN MODULE`: Fan module
	• `SIDEPLANE`: Sideplane
	`Description`
	The FRU description.
	`Part Number`
	The FRU part number.
	`Serial Number`
	The FRU serial number.
	`Revision`
	The hardware revision level.
	`Dash Level`
	The FRU template revision number.
	`FRU Shortname`

	A short description of the FRU.
	`Manufacturing Date`
	The date and time in the format *year-month-day hour:minutes:seconds* when a PCBA was programmed or a power supply module was manufactured.
	`Manufacturing Location`
	The city, state/province, and country where the FRU was manufactured.
	`Manufacturing Vendor ID`
	The JEDEC ID (global manufacturing code) of the manufacturer.
	`FRU Location`
	The location of the FRU in the enclosure.
	`Configuration SN`
	The configuration serial number.
	`FRU Status`
	• `Absent`: The FRU is not present.
	• `Fault`: The FRU's health is Degraded or Fault.
	• `Invalid Data`: The FRU ID data is invalid. The FRU's EEPROM is improperly programmed.
	• `OK`: The FRU is operating normally.
	• `Power OFF`: The FRU is powered off.
	`Original SN`
	For a power supply module, the original manufacturer serial number. Otherwise, N/A.
	`Original PN`
	For a power supply module, the original manufacturer part number. Otherwise, N/A.
	`Original Rev`
	For a power supply module, the original manufacturer hardware revision. Otherwise, N/A.
	`Enclosure ID`
	The enclosure number

Examples	Show information about all FRUs in the system. `# show frus`
Basetypes	enclosure-fru status

show host-groups

Description	Shows information about host groups and hosts. The command will show information for all host groups (and hosts) by default, or you can use parameters to filter the output.
Minimum role	monitor

Syntax	`show host-groups`
	`[hosts hosts]`
	`[groups host-groups]`

`Parameters`	`hosts hosts` Optional. A comma-separated list of the names of hosts for which to show host and initiator information. If this parameter is omitted, information is shown for all hosts. A value that includes a space must be enclosed in double quotes.

	`groups host-groups` Optional. A comma-separated list of the names of host groups for which to show host-group, host, and initiator information. If this parameter is omitted, information is shown for all host groups. A value that includes a space must be enclosed in double quotes.

Output	**Host group information:**
	`Name`
	The name of the host group.
	`Number of Members`
	The number of hosts in the host group.
	Host information:
	`Name`
	The host name.
	`Number of Members`
	The number of initiators in the host.
	Initiator information:
	`Nickname`
	The nickname of the initiator.
	`Discovered`
	• `Yes`: The initiator was discovered and its entry was automatically created.
	• `No`: The initiator was manually created
	`Mapped`
	Shows whether the initiator is explicitly mapped to any volumes:
	• `Yes`: At least one volume is explicitly mapped to the initiator.
	• `No`: No volumes are explicitly mapped to the initiator.
	`Profile`
	`Standard`: Default profile.
	`ID`
	For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).

Examples	Show information about all host groups.
	`# show host-groups`
	Show information about host groups HGroup1 and HGroup3.
	`# show host-groups groups HGroup1,HGroup3`

Basetypes	host-group status
See also	create host-group delete host-groups set host-group

show host-phy-statistics

Description	Shows diagnostic information relating to SAS controller physical channels, known as PHY lanes, for each host port.

	This command shows PHY status information for each host port found in an enclosure. Each controller in an enclosure may have multiple host ports. A host port may have multiply PHYs. For each PHY, this command shows statistical information in the form of numerical values. There is no mechanism to reset the statistics. All counts start from the time the controller started up. The counts stop at the maximum value for each statistic. This command is only applicable to systems that have controllers with SAS host ports.
Minimum role	monitor
Syntax	`show host-phy-statistics`

Output	`Ports`
	The controller ID and port number of the SAS host ports for which PHY statistics are displayed.
	`Phy`
	Identifies a PHY's logical location within a group based on the PHY type. Logical IDs are 0–3 for host port PHYs. Each SAS host will have multiple PHYs.
	`Disparity`
	The number of doublewords containing running disparity errors that have been received by the PHY, not including those received during Link Reset sequences. A running disparity error occurs when positive and negative values in a signal do not alternate.
	`Lost DWORD`
	The number of times the PHY has lost doubleword synchronization and restarted the Link Reset sequence.
	`Invld DWORD`
	The number of invalid doublewords that have been received by the PHY, not including those received during Link Reset sequences.
	`ResErrCnt`
	The number of times the PHY Reset sequence has failed

Examples	Show PHY statistics for controller host ports. `# show host-phy-statistics`
Basetypes	sas-host-phy-statistics status
See also	show host-port-statistics

show host-port statistics

Description	Shows live performance statistics for each controller host port. For each host port these statistics quantify I/O operations through the port between a host and a volume. For example, each time a host writes to a volume's cache, the host port's statistics are adjusted. For host-port performance statistics, the system samples live data every 15 seconds. Statistics shown only in API output are described in API basetypes properties.
Minimum role	monitor
Syntax	`show host-port-statistics` `[ports` **`ports`**`]`
Parameters	ports **`ports`** Optional. Specifies a comma-separated list of port IDs for which to show information. For port syntax, see Command syntax. If this parameter is omitted, information is shown for all host ports.

Output	`Durable ID`
	The host port ID in the format hostport_*controller-ID-and-port-number*.
	`Bps`
	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`IOPS`
	The input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`Reads`
	The number of read operations since these statistics were last reset or since the controller was restarted.
	`Writes`
	The number of write operations since these statistics were last reset or since the controller was restarted.
	`Data Read`
	The amount of data read since these statistics were last reset or since the controller was restarted.
	`Data Written`
	The amount of data written since these statistics were last reset or since the controller was restarted.
	`Queue Depth`
	The number of pending I/O operations being serviced.
	`I/O Resp Time`
	The average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.
	`Read Resp Time`
	The average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.
	`Write Resp Time`
	The average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.
	`Reset Time`
	The date and time, in the format *`year-month-day hour:minutes:seconds`*, when these statistics were last reset, either by a user or by a controller restart.

Examples	Show live performance statistics for all host ports.
	`# show host-port-statistics`
	Show live performance statistics for host port A1.
	`# show host-port-statistics ports a1`

Basetypes	host-port-statistics status
See also	reset all-statistics show host-port-statistics show host-phy-statistics show ports

show initiators

Description	Shows information about initiators. The command will show information about all initiators by default, or you can use parameters to filter the output. Initiator entries are automatically created for host initiators that have sent an `inquiry` command or a `report luns` command to the system. This typically happens when the physical host containing an initiator boots up or scans for devices. When the command is received, the system saves the host port information. However, the information is retained after a restart only if you have set a name for the initiator.
Minimum role	monitor

Syntax	`show initiators`
	`[hosts` *`hosts`*`]`
	`[`*`initiators`*`]`

Parameters	`hosts` *`hosts`* Optional. A comma-separated list of the names of hosts containing initiators for which to show information. If this parameter is omitted, information is shown for all initiators. *`initiators`* Optional. A comma-separated list of the names of initiators for which to show information. If this parameter is omitted, information is shown for all initiators.

Output	`Nickname`
	The name of the initiator.
	`Discovered`
	• `Yes`: The initiator was discovered and its entry was automatically created.
	• `No`: The initiator was manually created.
	`Mapped`
	Shows whether the initiator is explicitly mapped to any volumes:
	• `Yes`: At least one volume is explicitly mapped to the initiator.
	• `No`: No volumes are explicitly mapped to the initiator.
	`Profile`
	`Standard`: Default profile.
	`Host Type`
	The host-interface type: `FC`; `iSCSI`; `SAS`.
	`ID`
	For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).

Examples	Show information about all initiators.
	`# show initiators`
	Show information about initiators in host `Host1` only.
	`# show initiators hosts Host1`

Basetypes	status initiator
See also	delete initiator-nickname set initiator

	show host-groups (with the hosts parameter)

show inquiry

Description	Shows inquiry data for each controller module.
Minimum role	monitor
Syntax	show inquiry
Output	• Product vendor name, product ID, vendor ID, and SCSI product ID • Management Controller firmware version and loader version • Storage Controller firmware version and loader version • Controller module serial number • Media Access Control (MAC) address • Network port
Examples	Show inquiry data for controller modules in the system. `# show inquiry`
Basetypes	inquiry status
See also	show versions

show ipv6-addresses

Description	Shows static IPv6 addresses assigned to each controller's network port.
Minimum role	monitor
Syntax	`show ipv6-addresses` `[controller a|b|both]`
Parameters	`controller a|b|both` Optional. Specifies whether to show addresses for controller A, controller B, or both. If this parameter is omitted, information is shown for both controllers.

Output	`Ctlr`
	The controller ID: A or B.
	`Index`
	The controller's index value for the address. The index is automatically assigned when adding a static IPv6 address.
	`Label`
	The name assigned to the address, or '-' if the address is unnamed.
	`Address`
	The IPv6 address with prefix length.

Examples	Show static IPv6 addresses assigned to controller A. `# show ipv6-addresses controller a`
Base types	ipv6-network-parameters status

See also	add ipv6-address remove ipv6-address set ipv6-network-parameters show ipv6-network-parameters

show ipv6-network-parameters

Description	Shows the IPv6 settings and health of each controller module's network port.
Minimum role	monitor
Syntax	`show ipv6-network-parameters`

Output	`Autoconfig`
	• `enabled`: Uses an IPv6 address computed by SLAAC or assigned by a DHCPv6 server, depending on the network configuration. If a DHCPv6 address is available, then that address is used. Otherwise SLAAC is used.
	• `disabled`: Uses static IPv6 addresses set with the add ipv6-address command.
	`Gateway`
	The network port gateway IPv6 address.
	`Link-Local Address`
	The link-local IPv6 address.
	`Autoconfig IP`
	The automatically configured IPv6 address.
	`IPv6 Address (1-4)`
	Shown if Autoconfig is disabled. Shows between one and four manually set IPv6 addresses.
	`IPv6 Label (1-4)`
	Shown if Autoconfig is disabled. Shows the user-defined name, if set, for each manual IPv6 address.

Examples	Show IPv6 network parameters for each controller module. `# show ipv6-network-parameters`
Basetypes	ipv6-network-parameters status
See also	set ipv6-network-parameters

show iscsi-parameters

Description	Shows system-wide parameters for iSCSI host ports in each controller module.
Minimum role	monitor
Syntax	`show iscsi-parameters`
Output	CHAP Shows whether Challenge-Handshake Authentication Protocol (CHAP) is enabled or disabled. • `Enabled`: CHAP is enabled. • `Disabled`: CHAP is disabled. `Jumbo Frames`

	Shows whether support for jumbo frames is enabled or disabled.
	• `Enabled`: Jumbo-frame support is enabled.
	• `Disabled`: Jumbo-frame support is disabled.
	`iSNS`
	Shows whether support for Internet Storage Name Service (iSNS) is enabled or disabled.
	• `Enabled`: iSNS support is enabled.
	• `Disabled`: iSNS support is disabled.
	`iSNS IP`
	The address of the iSNS server. The default address is all zeroes.
	`iSNS Alt IP`
	The address of the alternate iSNS server. The default address is all zeroes.
	`iSCSI Speed`
	The iSCSI host port link speed.
	• `auto`: The proper speed is auto-negotiated.
	• `1Gbps`: The speed is forced to 1 Gbit/s, overriding a downshift that can occur during auto-negotiation with 1-Gbit/s HBAs. This setting does not apply to 10-Gbit/s HBAs.
	`iSCSI IP Version`
	• `4`: iSCSI host port addresses use IPv4 format.
	• `6`: iSCSI host port addresses use IPv6 format.

Examples	Show system-wide parameters for iSCSI ports. `# show iscsi-parameters`
Basetypes	iscsi-parameters status
See also	set iscsi-parameters

show license

Description	Shows the status of licensed features in the storage system.
Minimum role	monitor
Syntax	`show license`
Output	`License Key` The license key, licensing serial number, and status of licensed features. All licensed features are enabled.

show maps

Description	Shows information about mappings between volumes and initiators. If no parameter is specified, this command shows explicit mappings (but not default mappings) for all volumes. In a dual-controller system, if a mapping uses corresponding ports on both controllers, such as A1 and B1, the Ports field will simply show 1.
Minimum role	monitor
Syntax	`show maps` `[all]`

	`[initiator]` `[IDs]`

Parameters	`all`
	Optional. Shows mappings of all access types: read-write, read-only, no-access, and not-mapped (default mappings). If this parameter is omitted, mappings of type not-mapped are not shown.
	`initiator`
	Optional. Shows mapping information by initiator. If this parameter is omitted, mapping information is shown by volume.
	IDs
	Optional. A comma-separated list of the names or serial numbers of host-type items (initiators, hosts, and host groups) or volume-type items (volumes and volume groups) for which to show mappings. If a volume is mapped to a host group, to see mappings you must specify the host group, not a host or initiator in the group. If a volume is mapped to a host, to see mappings you must specify the host, not an initiator in the group.
	You can specify:
	● A host by name in the format *host-name*.*, where * represents all initiators in the host. Example: `FC-Server.*`
	● A host group by name in the format *host-group*.*.*, where the first * represents all hosts in the group and the second * represents all initiators in those hosts. Example: `TestLab.*.*`
	● A volume group by name in the format *volume-group*.*, where * represents all volumes in the group. Example:`TestVolumes.*`
	Do not include both host-type and volume-type items in a list. A name that includes a space must be enclosed in double quotes.

Output	Properties are described in alphabetical order.
	`Access`
	Type of host access to the volume:
	● `read-write`: Read and write.
	● `read-only`: Read only.
	● `no-access`: No access (masked).
	● `not-mapped`: Not mapped.
	`Group Name`
	For a volume group, its name in the format *`volume-group`*`.*`, where the * represents all volumes in the group.
	`ID`
	Shown by the `initiator` parameter. For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).
	`Host-Port-Identifier` (v2)For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).
	● `all other initiators`: The volume's default mapping.
	`Identifier` (v3)
	See `Host-Port-Identifier`, above.
	`Initiator-Identifier`
	Shown for a volume group mapping.
	● For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).
	● `all other initiators`: The volume's default mapping.
	`LUN`
	● The LUN that identifies the volume to a host.

	• For a volume group, * means multiple LUNs are represented in the group.
	• Blank if not mapped or mapped as `no-access`.
	`Name`
	The name of a volume or initiator.
	`Nickname`
	• For a host, its name in the format *`host-name`*`.*`, where the * represents all initiators in the host.
	• For a host group, its name in the format *`host-group`*`.*.*`, where the first * represents all hosts in the host group and the second * represents all initiators in those hosts.
	• Blank if not set or for `all other initiators/`
	`Ports`
	• The controller host ports to which the mapping applies.
	• Blank if not mapped or mapped as `no-access`.
	`Profile`
	`Standard`: Default profile.
	`Serial Number`
	The serial number of the volume group or volume.
	`Volume`
	• For a volume, its name.
	• For a volume group, its name in the format *`volume-group`*`.*`, where the * represents all volumes in the group.

Examples	Show mappings for all volumes.
	`# show maps`
	Show mapping information for all initiators.
	`# show maps initiator`
	Show mappings for volume group `VGroup1` and ungrouped volume `v1`.
	`# show maps VGroup1.*,v1`

Basetypes	initiator-view host-group-view host-view-mappings volume-group-view volume-group-view-mappings volume-view volume-view-mappings status
See also	show host-groups show initiators show volume-groups show volumes

show network-parameters

Description	Shows the settings and health of each controller module's network port

Minimum role	monitor
Syntax	`show network-parameters`

Output	`IP Address`
	The network port IP address.
	`Gateway`
	The network port gateway IP address.
	`Subnet Mask`
	The network port IP subnet mask.
	`MAC Address`
	The controller's unique Media Access Control address.
	`Addressing Mode`
	• `Manual`: Network settings are set manually (statically).
	• `DHCP`: DHCP is used to set network parameters.
	`Link Speed`
	• `Unknown`: For a system operating in Single Controller mode, this controller module is not present.
	• `10mbps`: The network port link speed is set to 10 Mb/s.
	• `100mbps`: The network port link speed is set to 100 Mb/s.
	• `1000mbps`: The network port link speed is set to 1000 Mb/s.
	`Duplex Mode`
	• `Undefined`: For a system operating in Single Controller mode, this controller module is not present.
	• `half`: The network port duplex mode is set to half duplex.
	• `full`: The network port duplex mode is set to full duplex.
	`Auto Negotiation`
	• `Disabled`: Either the network port has not been set, or it has been unset because the controller module was removed from its enclosure, or the port is connected to a switch and is set to use the link speed and duplex mode shown by the Link Speed and Duplex Mode fields.
	• `Enabled`: The network port is set to auto-negotiate a link speed (up to the maximum speed shown by the Link Speed field) and duplex mode with a connected Ethernet switch.
	`Health`
	The health of the network connection.
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Health Reason`
	If Health is not `OK`, this field shows the reason for the health state.
	`Health Recommendation`
	If Health is not `OK`, this field shows recommended actions to take to resolve the health issue.

Examples	Show network parameters for each controller module. `# show network-parameters`
Basetypes	network-parameters status
See also	set network-parameters

show ntp-status

Description	Shows the status of the use of Network Time Protocol (NTP) in the system.
Minimum role	monitor
Syntax	show ntp-status

Output	`NTP Status`
	• `activated`: NTP is enabled.
	• `deactivated`: NTP is disabled.
	`NTP Server Address`
	• The network address of the current NTP server if NTP is enabled.
	• The network address of the last-set NTP server if NTP was enabled and has been disabled.
	• 0.0.0.0 if the NTP server IP address has not been set.
	`Last Server Contact`
	The date and time in the format *`year-month-day hour:minutes:seconds`* of the last message received from the NTP server, or none.

Examples	Show NTP status for the system. `# show ntp-status`
Basetypes	ntp-status status
See also	set controller-date

show peer-connections

Description	Shows information about a peer connection between two systems. You can run this command on either the local or remote system.
Minimum role	monitor

Syntax	`show peer-connections`
	`[verify-links]`
	`peer-connection-ID`

Parameters	`[verify-links]` Optional. If a peer connection ID is specified, this parameter displays the ports that can be seen by each port on each peer system. *`peer-connection-ID`* Optional. Specifies the name or serial number of the peer connection for which to show information. If this parameter is not specified the command shows information for all peer connections.

Output	`Peer Connection Name`
	The name of the peer connection.
	`Peer Connection Type`
	The type of ports being used for the peer connection:
	• `FC`: FC ports.
	• `iSCSI`: iSCSI ports.
	`Connection Status`

	• `Online`: The systems have a valid connection.
	• `Offline`: No connection is available to the remote system.
	`Health`
	• `OK`
	• `Fault`
	• `Unknown`
	`Health Reason`
	If `Health` is not `OK`, this field shows the reason for the health state.
	`Health Recommendation`
	If `Health` is not `OK`, this field shows recommended actions to take to resolve the health issue.
	`Local Port`
	The IDs of ports in the local system.
	`Port Address`
	The assigned port address.
	`Remote Port`
	The IDs of ports in the remote system.
	`Reachable Remote Links`
	Shown by the `verify-links` parameter. The IDs of linked ports in the remote system.
	`Reachable Local Links`
	Shown by the `verify-links` parameter. The IDs of linked ports in the local system

Examples	Show information for all peer connections.
	`# show peer-connections`
	Show information for peer connection `Peer1`.
	`# show peer-connections Peer1`
	Show information for peer connection `Peer1` and the ports that can be seen from each port.
	`# show peer-connections Peer1 verify-links`

Basetypes	peer-connections status
See also	create peer-connection delete peer-connection query peer-connection set peer-connection

show pools

Description	Shows information about linear and virtual pools. The command will show information for all pools by default, or you can use parameters to filter the output. The system can have a maximum of two virtual pools. The system can have a maximum of two virtual pools. **NOTE:** For a virtual pool, new data will not be written to, or existing data migrated to, a degraded disk group unless it is the only disk group having sufficient available space for the data.
Minimum role	monitor
Syntax	`show pools`

	`[type linear|virtual]`
	`[pool]`
	`type linear|virtual`
	Optional. Specifies whether to show information for linear pools or for virtual pools. If this parameter is omitted, information will be shown for both types.
	`pool`
	Optional. The name or serial number of the pool for which to show information. If this parameter is omitted, information is shown for all pools

Output	`Name`
	The name of the pool.
	`Serial Number`
	The serial number of the pool.
	`Class`
	• `Linear`: Linear pool.
	• `Virtual`: Virtual pool.
	`Total Size`
	The total capacity of the pool.
	`Avail`
	The available capacity in the pool.
	`Snap Size`
	The pool capacity used by linear snap pools or virtual snapshots
	`OverCommit`
	• `Enabled`: The allocated size of the volumes can exceed the physical capacity of the pool.
	• `Disabled`: The allocated size of the volumes cannot exceed the physical capacity of the pool.
	`Disk Groups`
	The number of disk groups in the pool.
	`Volumes`
	The number of volumes in the pool.
	`Low Thresh`
	The low threshold for page allocation as a percentage of pool capacity. When this threshold is exceeded, event 462 will be logged with Informational severity.
	`Mid Thresh`
	The middle threshold for page allocation as a percentage of pool capacity. When this threshold is exceeded, event 462 will be logged. If the pool is not overcommitted, the event will have Informational severity. If the pool is overcommitted, the event will have Warning severity.
	`High Thresh`
	The high threshold for page allocation as a percentage of pool capacity. The threshold value is automatically calculated based on the available capacity of the pool minus 200 GB of reserved space. When this threshold is exceeded, event 462 will be logged. If the pool is not overcommitted, the event will have Informational severity. If the pool is overcommitted, the event will have Warning severity and the system will use write-through cache mode until page allocation drops back below this threshold.
	• When the overcommit feature is disabled, the host does not lose read or write access to the pool volumes when the pool reaches or exceeds the high threshold value.
	• When the overcommit feature is enabled, the storage system sends the data protect sense key `Add, Sense: Space allocation failed write protect` to the host when the pool reaches or exceeds the high threshold value. If the host is rebooted after the pool reaches or

	exceeds the high threshold value, the host loses read and write access to the pool volumes. The only way to regain read and write access to the pool volumes is to add more storage to the pool.
	`Sec Fmt`
	The sector format of disks in the pool.
	• `512n`: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes.
	• `512e`: All disks use 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.
	• `Mixed`: The pool contains a mix of 512n and 512e disks. This is supported, but for consistent and predictable performance, do not mix disks of different sector size types (512n, 512e).
	`Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Reason`
	If Health is not `OK`, this field shows the reason for the health state.
	`Action`
	If Health is not `OK`, this field shows recommended actions to take to resolve the health issue

Examples	Show information about all pools.
	`# show pools`
	Show information about virtual pools.
	`# show pools type virtual`

Basetypes	pools disk-groups tiers
See also	delete pools set pool show pool-statistics

show pool-statistics

Description	Shows live or historical performance statistics for virtual pools. For pool performance statistics, the system samples live data every 30 seconds and historical data every 5 minutes, and retains historical data for 6 months. The historical option allows you to specify a time range or a number (count) of data samples to include. It is not recommended to specify both the time-range and count parameters. If both parameters are specified, and more samples exist for the specified time range, the samples' values will be aggregated to show the required number of samples. Statistics shown only in API output are described in API basetype properties.
Minimum role	monitor

Syntax	To show live statistics:
	`show pool-statistics`
	`[pools` *`pool`*`]`

	`[tier performance|standard|archive|readcache]`
	To show historical statistics:
	`show pool-statistics`
	`[all]`
	`[count` *`number-of-data-samples`*`]`
	`[filename` *`filename`*`.csv]`
	`historical`
	`[pools` *`pool`*`]`
	`[tier performance|standard|archive|readcache]`
	`[time-range "`*`date/time-range`*`"]`

Parameters	`all`
	Optional. Specifies to show the full set of performance metrics. If this parameter is omitted, the default set of performance metrics will be shown.
	`count number-of-data-samples`
	Optional. Specifies the number of data samples to display, from 1 to 100. Each sample will be shown as a separate row in the command output. If this parameter is omitted, 100 samples will be shown. If you specify this parameter, do not specify the `time-range` parameter.
	`filename` *`filename`*`.csv`
	Optional. Specifies to save historical statistics, in CSV format, to a file on the controller. To access the file, use SFTP or FTP.
	`historical`
	Optional. Specifies to show historical statistics. If this parameter is omitted, live statistics will be shown.
	`pools` *`pool`*
	Optional. Specifies the name or serial number of the virtual pool for which to show information. If this parameter is omitted, information will be shown for both pools A and B. A name that includes a space must be enclosed in double quotes.
	`tier performance|standard|archive|readcache`
	Optional. Specifies the tier for which to show statistics.
	`time-range "`*`date/time-range`*`"`
	Optional. Specifies the date/time range of historical statistics to show, in the format "start *yyyy-mm-dd hh*:*mm*[AM| PM] end *yyyy-mm-dd hh*:*mm*[AM|PM]". If the start date/time is specified but no end date/time is specified, the current date/time will be used as the end date/time. The system will return the oldest sample taken after the start time and the latest sample taken before the end time. If the specified start date/time is earlier than the oldest sample, that sample will be used as the start date/time. If you specify this parameter, do not specify the count parameter. If this parameter is omitted, the most recent 100 data samples will be displayed.
	`disks`
	Optional. Specifies a comma-separated list of disks for which to show information. If this parameter is omitted, information will be shown for all disks. For disk syntax, see Command syntax.

Output	**Live**
	`Pool`
	The name of the pool.
	`Pages Allocated per Min`
	The rate, in pages per minute, at which pages are allocated to volumes in the pool because they need more space to store data.
	`Pages Deallocated per Min`

The rate, in pages per minute, at which pages are deallocated from volumes in the pool because they no longer need the space to store data.

`Pages Unmapped per Minute`

The number of 4 MB pages that host systems have unmapped per minute, through use of the SCSI UNMAP command, to free storage space as a result of deleting files or formatting volumes on the host.

`Time Since Reset`

The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.

`Reads`

The number of read operations since these statistics were last reset or since the controller was restarted.

`Writes`

The number of write operations since these statistics were last reset or since the controller was restarted.

`Data Read`

The amount of data read since these statistics were last reset or since the controller was restarted.

`Data Written`

The amount of data written since these statistics were last reset or since the controller was restarted.

`Bps`

The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

`IOPS`

The number of input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

`I/O Resp Time`

The average response time, in microseconds, for read and write operations since the last sampling time.

`Read Resp Time`

Shown by the <codeph>all</codeph> parameter. The average response time, in microseconds, for read operations since the last sampling time.

`Write Resp Time`

Shown by the <codeph>all</codeph> parameter. The average response time, in microseconds, for write operations since the last sampling time.

Historical

For a pool:

`Pool`

The name of the pool.

`Total I/Os`

The total number of read and write operations since the last sampling time.

`Reads`

Shown by the <codeph>all</codeph> parameter. The number of read operations since the last sampling time.

`Writes`

Shown by the <codeph>all</codeph> parameter. The number of write operations since the last sampling time.

`Data Transferred`

The total amount of data read and written since the last sampling time.

`Data Read`

Shown by the <codeph>all</codeph> parameter. The amount of data read since the last sampling time.

`Data Written`

Shown by the <codeph>all</codeph> parameter. The amount of data written since the last sampling time.

`Total IOPS`

The total number of read and write operations per second since the last sampling time.

`Read IOPS`

Shown by the <codeph>all</codeph> parameter. The number of read operations per second since the last sampling time.

`Write IOPS`

Shown by the <codeph>all</codeph> parameter. The number of write operations per second since the last sampling time.

`Total B/s`

The total data transfer rate, in bytes per second, since the last sampling time.

`Read B/s`

Shown by the <codeph>all</codeph> parameter. The data transfer rate, in bytes per second, for read operations since the last sampling time.

`Write B/s`

Shown by the <codeph>all</codeph> parameter. The data transfer rate, in bytes per second, for write operations since the last sampling time.

`Allocated Pages`

The number of 4 MB pages allocated to volumes in the pool.

`Sample Time`

Date and time, in the format *`year-month-day hour:minutes:seconds`*, when the data sample was taken.

For each tier in the pool:

`Pool`

The name of the pool.

`Tier`

The name of the tier.

`Total I/Os, Reads, Writes, Data Transferred, Data Read, Data Written, Total IOPS, Read IOPS, Write IOPS, Total B/s, Read B/s, Write B/s`

As described for a pool, above.

`Allocated Pages`

The number of 4 MB pages allocated to volumes in the tier.

`Page Moves In`

The number of pages moved into this tier from a different tier.

`Page Moves Out`

The number of pages moved out of this tier to other tiers.

`Page Rebalances`

	The number of pages moved between disks in this tier to automatically load balance.
	`Initial Allocations`
	The number of 4 MB pages that are allocated as a result of host writes. This number does not include pages allocated as a result of background tiering page movement. (Tiering moves pages from one tier to another, so one tier will see a page deallocated, while another tier will show pages allocated. These background moves are not considered initial allocations.)
	`Unmaps`
	The number of 4 MB pages that are automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).
	`RC Copies`
	The number of 4 MB pages copied from spinning disks to SSD read cache (read flash cache).
	`Zero-Pages Reclaimed`
	The number of empty (zero-filled) pages that were reclaimed during this sample period.
	`Sample Time`
	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when the data sample was taken.

Examples	Show live statistics for both pools.
	`# show pool-statistics`
	Show historical statistics from a specified date and time range for pool A.
	`# show pool-statistics pools A historical time-range "start 2014-06-01 4:40 PM end 2014-06-01 5:00 PM"`
	Show all samples of historical statistics for the Standard tier in pool A.
	`# show pool-statistics historical all pools A tier standard`

Basetypes	pool-statistics (live) resettable-statistics (live) tier-statistics (live) pool-summary (historical) pool-hist-statistics (historical) tier-summary (historical) tier-hist-statistics (historical) readcache-hist-statistics (historical) status
See also	reset all-statistics reset pool-statistics show pools

show ports

Description	Shows information about host ports in each controller.
Minimum role	monitor
Syntax	`show ports` `[detail]`
Parmeters	`detail`

	Optional. This parameter shows additional detail about the port status, including SFP information.

Output	`Ports`
	Controller ID and port number
	`Media`
	● `FC(P)`: Fibre Channel Point-to-Point
	● `FC(L)`: Fibre Channel-Arbitrated Loop (public or private)
	● `FC(-)`: Not applicable, as when the port is disconnected
	● `SAS`: Serial Attached SCSI
	● `iSCSI`: Internet SCSI
	`Target ID`
	For an FC port, its WWPN. For a SAS port, its WWPN. For an iSCSI port, its node name (typically the IQN).
	`Status`
	● `Up`: The port is cabled and has an I/O link.
	● `Warning`: Not all of the port's PHYs are up.
	● `Error`: The port is reporting an error condition.
	● `Not Present`: The controller module is not installed or is down.
	● `Disconnected`: Either no I/O link is detected or the port is not cabled.
	`Speed(A)`
	● Actual link speed in Gbit/s.
	● Blank if not applicable.
	`Speed(C)`
	Configured host-port link speed in Gbit/s. Not shown for SAS.
	● FC: `Auto, 16Gb, 8Gb`, or `4Gb`
	● iSCSI: `Auto`
	● Blank if not applicable
	`Health`
	● `OK`
	● `Degraded`
	● `Fault`
	● `N/A`
	● `Unknown`
	`Reason`
	If Health is not `OK`, this field shows the reason for the health state.
	`Action`
	If Health is not `OK`, this field shows recommended actions to take to resolve the health issue.
	`Topo (C)`
	FC and SAS only. Configured topology.
	`Lanes Expected`
	SAS only. If the `detail` parameter is specified, this field shows the expected number of PHY lanes in the SAS port.
	`Active Lanes`
	SAS only. If the `detail` parameter is specified, this field shows the number of active lanes in the SAS port. If the port is connected and fewer lanes are active than are expected, the port status will change to `Warning`, the health will change to `Degraded`, and event 354 will be logged.
	`Disabled Lanes`

	SAS only. If the detail parameter is specified, this field shows the number of disabled lanes in the SAS port.
	`PID`
	FC only. If the `detail` parameter is specified, this field is shown. If the port is using loop topology and the port status is Up, this field shows the primary loop ID. If the port is not using loop topology or the port status is not Up, this field shows N/A.
	`IP Version`
	iSCSI only. IPv4 or IPv6.
	`IP Address`
	iSCSI only. Assigned port IP address.
	`Gateway`
	iSCSI only. For IPv4, gateway IP address for assigned IP address.
	`Netmask`
	iSCSI only. For IPv4, subnet mask for assigned IP address.
	`Default Router`
	iSCSI only. For IPv6, default router for assigned IP address.
	`Link-Local Address`
	iSCSI only. For IPv6, the link-local address that is automatically generated from the MAC address and assigned to the port.
	`MAC`
	iSCSI only. Unique Media Access Control (MAC) hardware address, also called the physical address.
	`SFP Status`
	If the detail parameter is specified, this field shows the SFP status:
	● `OK`
	● `Not present`: No SFP is inserted in this port.
	● `Not compatible`: The SFP in this port is not qualified for use in this system. When this condition is detected, event 464 is logged.
	● `Incorrect protocol`: The SFP protocol does not match the port protocol. When this condition is detected, event 464 is logged.
	`Part Number`
	If the `detail` parameter is specified, this field shows the SFP part number.
	`Supported Speeds`
	FC only. If the `detail` parameter is specified, this field shows the link speeds that the SFP supports.
	`10G Compliance`
	iSCSI only. If the `detail` parameter is specified, this field shows the SFP's 10G compliance code. If the SFP returns an unsupported code, this field will show the equivalent hex value.
	`Ethernet Compliance`
	iSCSI only. If the `detail` parameter is specified, this field shows the SFP's Ethernet compliance code. If the SFP returns an unsupported code, this field will show the equivalent hex value.
	`Cable Technology`
	iSCSI only. If the `detail` parameter is specified, this field shows whether the SFP supports active or passive cable technology.
	`Cable Length`
	iSCSI only. If the `detail` parameter is specified, this field shows the link length (in meters) that is supported by the SFP while operating in compliance with applicable standards for the cable type.

Examples	Show information about host ports in each controller module.

	`# show ports`
	Show detailed information about host ports in each controller module.
	`# show ports detail`

Basetypes	port status
See also	set host-parameters

show power-supplies

Description	Shows information about each power supply in the storage system.
Minimum role	monitor
Syntax	show power-supplies

Output	`Encl`
	The ID of the enclosure that contains the power supply.
	`Id`
	The power supply position, shown as an index value that starts at 0 and increments from left to right as viewed from the back of the enclosure
	`Serial Number`
	The serial number of the power supply.
	`Part Number`
	• (blank): Not applicable.
	`Name`
	The power supply identifier and location.
	`Firmware Version`
	• (blank): Not applicable.
	• The firmware revision of the power supply.
	`Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Reason`
	If Health is not `OK`, this field shows the reason for the health state.
	`Action`
	If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Examples	Show information about each power supply in each enclosure. `# show power-supplies`
Basetypes	power-supplies fan status
See also	show fans

	show frus

show protocols

Description	Shows which management services and protocols are enabled or disabled.
Minimum role	monitor
Syntax	`show protocols`

Output	`Web Browser Interface (HTTP)`
	Shows whether the standard PowerVault Manager web server interface is enabled or disabled.
	`Secure Web Browser Interface (HTTPS)`
	Shows whether the secure PowerVault Manager web server interface is enabled or disabled.
	`Command Line Interface (Telnet)`
	Shows whether the standard CLI is enabled or disabled.
	`Secure Command Line Interface (SSH)`
	Shows whether the secure shell CLI is enabled or disabled.
	`Storage Management Initiative Specification (SMI-S)`
	Shows whether the secure SMI-S interface is enabled or disabled. When enabled, this option allows SMI-S clients to communicate with each controller's embedded SMI-S provider via HTTP port 5989.
	`Unsecure Storage Management Initiative Specification (SMI-S 5988)`
	Shows whether the unsecure SMI-S interface is enabled or disabled. When enabled, this option allows SMI-S clients to communicate with each controller's embedded SMI-S provider via HTTP port 5988.
	`Service Location Protocol (SLP)`
	Shows whether the SLP interface is enabled or disabled.
	`File Transfer Protocol (FTP)`
	Shows whether the unsecure secondary interface for installing firmware updates, installing security certificates and keys and downloading logs is enabled or disabled.
	`SSH File Transfer Protocol (SFTP)`
	Shows whether the secure secondary interface for installing firmware updates, installing security certificates and keys and downloading logs is enabled or disabled.
	`Simple Network Management Protocol (SNMP)`
	Shows whether the SNMP interface is enabled or disabled. When this is disabled, all SNMP requests to the MIB are disabled and SNMP traps are disabled.
	`Service Debug`
	Shows whether the Telnet debug port is enabled or disabled.
	`In-band SES Management (SES)`
	Shows whether the in-band SES interface is enabled or disabled.
	`Activity Progress Reporting (activity)`
	Shows whether access to the activity progress interface via HTTP port 8081 is enabled or disabled. This mechanism reports whether a firmware update or partner firmware update operation is active and shows the progress through each step of the operation. In addition, when the update operation completes, status is presented indicating either the successful completion, or an error indication if the operation failed.
	`Management Mode`
	Shows the default management mode.

	• `Linear`: Uses linear-storage terminology in command output and system messages. For example, *vdisk* for disk groups and pools.
	• `Virtual`: Uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, *disk group* for disk groups and *pool* for pools.
	To see the management mode for the current CLI session, which can be set differently than the default, use the show cli-parameters command.
	`SSH Port`
	Shows the port number used for SSH.
	`SFTP Port`
	Shows the port number used for SFTP.

Examples	Show the status of service and security protocols. `# show protocols`
Basetypes	security-communications-protocols communication-ports status
See also	set protocols show cli-parameters

show provisioning

Description	Shows information about how the system is provisioned. This command shows the associations between controllers, disks, disk groups or pools, volumes, and mappings. The command will show information for all associations by default, or you can use parameters to filter the output. This command is useful for the following purposes: • You want a quick overview of how the system is provisioned. • You know of a disk-related issue (perhaps from the event log) and want to understand what components it may be impacting. You can use this command to see which volume WWNs are affected, which you can use on the host to determine which device node might be seeing errors. • You know of a volume-level issue and want to determine which associated components to investigate. You can use this command to quickly see which controller owns the volume and which disks are associated with the volume. For example, perhaps at the OS level, a certain device node (target) looks "slow" relative to the rest of the targets. You can correlate the OS device node to the volume WWN (or LUN), and then use the command output to find the associated controller and disks.
Minimum role	monitor

Syntax	`show provisioning`
	`[disks` *`disks`* `| luns` *`LUNs`* `| pool` *`pools`* `| ports` *`ports`* `| vdisks` *`vdisks`*`| volumes` *`volumes`* `] [no-mapping]`
	`[unhealthy]`

Parameters	`disks` **`disks`** Optional. Shows provisioning information for the specified list of disks. For disk syntax, see Command syntax. This command does not support the use of hyphens to indicate a range of disks. `luns` *`LUNs`* Optional. Shows provisioning information for the specified list of LUNs. `no-mapping`

	Optional. Shows the Mapped field but no other mapping information. If this parameter is omitted, all mapping information is shown. `pool` *pools* Optional. Shows provisioning information for the specified list of pools. A name that includes a space must be enclosed in double quotes. `ports` *ports* Optional. Shows provisioning information for the specified list of ports. For port syntax, see Command syntax. This command does not support the use of hyphens to indicate a range of ports. `vdisks` *vdisks* Optional. For linear storage, this shows provisioning information for the specified list of disk groups. A name that includes a space must be enclosed in double quotes. `volumes` *volumes* Optional. Shows provisioning information for the specified list of volumes. A name that includes a space must be enclosed in double quotes. `unhealthy` Optional. Shows provisioning information for disk groups or pools whose health is not OK. If this parameter is omitted, provisioning information is shown for all disk groups or pools.

Output	**Volume information:**
	`Volume`
	• Volume name.
	• Blank if the disk group or pool does not have a volume.
	`WWN`
	• Volume World Wide Name.
	• Blank if the disk group or pool does not have a volume.
	`Ctlr`
	Owning controller of the disk group or pool.
	`Disks`
	Shorthand list of the disks within a disk group or pool.
	`Pool` (v3)
	Pool name.
	`Vdisk` (v2)
	Disk group name.
	`Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Mapped`
	Indicates whether the volume is mapped. This is useful when the no-mapping parameter is specified to hide detailed mapping information.
	• `Yes`: The volume is mapped.
	• `No`: The volume is not mapped.
	Mapping information:
	`Ports`
	• Controller host ports that the mapping applies to.

	• Blank if not mapped or mapped as no-access. .
	`LUN`
	• LUN that identifies the volume to a host.
	• Blank if not mapped or mapped as no-access.
	`Access`
	Type of host access to the volume:
	• `read-write`: The host has read and write access to the volume.
	• `read-only`: The host has read access to the volume.
	• `no-access`: The host is denied access to the volume.
	• `not-mapped`: The host is not mapped to the volume.
	`Host-Port-Identifier` (v2) `or Identifier` (v3)
	• For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).
	• `all other initiators`: The volume's default mapping.
	`Nickname`
	Host nickname, or blank if not set or for `all other hosts`.
	`Profile`
	`Standard`: Default profile.

Examples	Show provisioning for the system.
	`# show provisioning`
	Show provisioning for disk group `myR1`.
	`# show provisioning vdisks myR1`
	Show provisioning for all unhealthy disk groups.
	`# show provisioning unhealthy`

Basetypes	provisioning status
See also	show disk-groups show disks show maps show pools show vdisks

show redundancy-mode

Description	Shows the redundancy status of the system.
Minimum role	monitor
Syntax	`show redundancy-mode`
Output	`Controller Redundancy Mode` Shows the system's operating mode, also called the cache redundancy mode: • `Independent Cache Performance Mode`: For a dual-controller system, controller failover is disabled and data in a controller's write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.

	• `Active-Active ULP`: Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance.
	• `Single Controller`: The enclosure contains a single controller.
	• `Failed Over`: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy.
	• `Down`: Both controllers are not operational.
	`Controller Redundancy Status`
	• `Redundant with independent cache`: Both controllers are operational but are not mirroring their cache metadata to each other.
	• `Operational but not redundant`: In active-active mode, one controller is operational and the other is offline. In single-controller mode, the controller is operational.
	• `Redundant`: Both controllers are operational.
	• `Down`: This controller is not operational.
	• `Unknown`: Status information is not available.
	`Controller ID Status`
	• `Operational`: The controller is operational.
	• `Down`: The controller is installed but not operational.
	• `Not Installed`: The controller is not installed.
	`Controller ID Serial Number`
	• Controller module serial number
	• `Not Available`: The controller is down or not installed.
	`Other MC Status`
	The operational status of the Management Controller in the partner controller. This is not factored into system health.
	• `Operational`
	• `Not Operational`
	• `Not Communicating`
	• `Unknown`

Examples	Show the redundancy status of the system. `# show redundancy-mode`
Basetypes	redundancy status

show refresh-counters

Description	In XML API format only, shows when the data represented by the basetype was last updated. The value 0 means the data has never been updated and is not cached. A value other than 0 is a timestamp indicating that the data has been updated. If the value has changed since the last time you called this command then the data has changed.
Minimum role	monitor
Syntax	`show refresh-counters`
Basetypes	refresh-counters status
See also	set cli-parameters

show remote-systems

Description	Shows information about remote systems associated with the local system. This command applies to linear storage only.
Minimum role	monitor
Syntax	`show remote-systems` `[system]`
Parameters	`system` Optional. The name or network-port IP address of the remote system about which to show information.

Output	`System Name`
	The name of the remote system.
	`System Contact`
	The name of the person who administers the remote system.
	`System Location`
	The location of the remote system.
	`System Information`
	A brief description of the remote system.
	`Vendor Name`
	The vendor name of the remote system.
	`Product ID`
	The product model identifier of the remote system.
	`Product Brand`
	The brand name of the remote system.
	`IP Address Controller A`
	The IP address of the network port in controller A in the remote system.
	`IP Address Controller B`
	The IP address of the network port in controller B in the remote system.
	`Username`
	The name of a user with the manage role in the remote system.
	`Status`
	• `Uninitialized`: This system hasn't communicated with the remote system.
	• `Ready`: This system has contacted the remote system and it is ready to use.
	• `Connected`: This system is transferring data to the remote system.
	• `Not Connected`: The system is not connected to the remote system.
	`Last Connected`
	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when successful communication was last established between the Management Controller in the local system and the Management Controller in the remote system. This value does not indicate when connection status was last determined, and will not be updated if the remote Management Controller is not accessible or if the connection status is `Not Connected`.

Examples	Show information about remote system `System2`. `# show remote-systems System2`
Basetypes	remote-system

	status
See also	delete remote-system

show replication-sets

Description	Shows information about replication sets in the peer connection. This command applies to virtual storage only. You can view information about all replication sets or a specific replication set. For virtual storage, you can run this command on either the primary or secondary system. In console mode, this command does not show the serial numbers of items such as replication volumes. To see serial numbers, run this command in API mode. Timestamps use the local time zone of the system on which this command is run. **NOTE:** If you change the time zone of the secondary system in a replication set whose primary and secondary systems are in different time zones, you must restart the system to enable management interfaces to show proper time values for replication operations. Properties shown only in API output are described in API basetypes properties
Minimum role	monitor
Syntax	`show replication-sets` `[replication-set-ID]`
Parameters	`replication-set-ID` Optional. The name or serial number of a replication set for which to display information at the replication set level. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all replication sets.

Output	**Overview information:**
	`Name`
	The replication set name.
	`Group`
	• `Yes`: The replication set is part of a group.
	• `No`: The replication set is not part of a group.
	`Primary Location`
	The location of the primary volume in the replication set: Local or Remote.
	`Peer`
	The name of the peer connection.
	`Primary Volume`
	The primary volume name. If it is a volume group, it uses the .* notation.
	`Secondary Volume`
	The secondary volume name. If it is a volume group, it uses the .* notation
	`Policy`
	The action to take when a replication is running and a new replication is requested.
	• `discard`: Discard the new replication request.
	• `queue-latest`: Take a snapshot of the primary volume and queue the new replication request. If the queue contained an older replication request, discard that older request. A maximum of one replication can be queued.
	`Queue Count`
	The number of queued replications for the replication set: either 0 or 1.

	`Status`
	• `Not Ready`: The replication set is not ready for replications because the system is still preparing the replication set.
	• `Unsynchronized`: The primary and secondary volumes are unsynchronized because the system has prepared the replication set, but the initial replication has not run.
	• `Running`: A replication is in progress.
	• `Ready`: The replication set is ready for a replication.
	• `Suspended`: Replications have been suspended.
	• `Unknown`: This system cannot communicate with the primary system and thus cannot be sure of the current state of the replication set. Check the state of the primary system.
	`Last Successful Run`
	The date and time when the system took a snapshot of the primary volume in preparation for starting the last successful replication run. The value shows when the primary and secondary volumes were last known to be in sync.
	`Last Status`
	The status of the last attempted replication.
	Last run or current run information:
	`Replication`
	Last Run or Current Run.
	`Progress`
	The percentage complete for an active replication. Otherwise, N/A.
	`Data Transferred`
	The total number of bytes transferred.
	`Start Time`
	The date and time when the replication started.
	`End Time`
	For the last run, the date and time when the replication ended.
	`Estimated Completion Time`
	For the current run, the date and time when the replication is estimated to end.
	`Run Error`
	A message that says whether the replication succeeded or an error occurred.

Examples	Show information about all replication sets.
	`# show replication-sets`
	Show information about replication set `RS1`.
	`# show replication-sets RS1`

Basetypes	cs-replication cs-replication-set status
See also	create replication-set delete replication-set resume replication-set set replication-set suspend replication-set

show replication-snapshot-history

Description	Shows information about the snapshot history for all replication sets or a specific replication set. You can run this command on either the primary or secondary system to see snapshot-history settings for a replication set and details about local replication snapshots. In console mode, this command does not show the serial numbers of items such as replication volumes. To see serial numbers, run this command in API mode.
Minimum role	monitor
Syntax	`show replication-snapshot-history` `[`*`replication-set-ID`*`]`
Parameters	`replication-set-ID` Optional. The name or serial number of a replication set for which to display information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all replication sets.

Output	**Snapshot settings:**
	`Replication Set`
	The replication set name.
	`Snapshot History`
	• `disabled` or `off`: A snapshot history will not be kept.
	• `secondary`: A snapshot history set will be kept on the secondary system for the secondary volume, using `snapshot-count` and `snapshot-basename` settings.
	• `both`: A snapshot history will be kept for the primary volume on the primary system and for the secondary volume on the secondary system. Both snapshot histories will use the same `snapshot-count` and `snapshot-basename` settings.
	`Count`
	The number of snapshots to retain in snapshot history. When a new snapshot exceeds this limit, the oldest snapshot in the snapshot history is deleted.
	`Basename`
	The user-defined prefix for the snapshots.
	`Retention Priority`
	The retention priority for snapshots, which is used when automatic deletion of snapshots is enabled by using the set snapshot-space command. In a snapshot tree, only leaf snapshots can be deleted automatically. Deletion based on retention priority is unrelated to deleting the oldest snapshots to maintain a snapshot count.
	• `never-delete`: Snapshots will never be deleted automatically to make space. The oldest snapshot in snapshot history will be deleted once the snapshot-count has been exceeded.
	• `high`: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted.
	• `medium`: Snapshots can be deleted after all eligible low-priority snapshots have been deleted.
	• `low`: Snapshots can be deleted.
	Snapshot information:
	`Local Snapshot`
	The snapshot name.
	`Creation Date/Time`
	The date and time when the snapshot was prepared or committed.
	`Snap Data`
	The total amount of write data associated with the snapshot.
	`Unique Data`

	The amount of write data that is unique to the snapshot

Examples	Show snapshot-history information for all replication sets.
	`# show replication-snapshot-history`
	Show snapshot-history information for replication set `RS1`.
	`# show replication-snapshot-history RS1`

Basetypes	replication-snapshot-history current-replication-snapshots status
See also	show replication-sets show snapshots

show sas-link-health

Description	Shows the condition of SAS expansion-port connections.
Minimum role	monitor
Syntax	`show sas-link-health`

Output	`Encl`
	The enclosure ID.
	`Ctlr`
	The ID of the controller module or expansion module.
	`Name`
	• `Out Port`: Egress (expansion) port in a controller module or an expansion module. Can be connected to an ingress port in an expansion module.
	• `In Port`: Ingress port in an expansion module. Can be connected to an egress (expansion) port in a controller module or an expansion module.
	• `Universal Port`: Port that can function as either an egress or ingress port in a controller module or an expansion module.
	`Status`
	• `Up`: The port is cabled and has an I/O link.
	• `Warning`: Not all of the port's PHYs are up.
	• `Error`: The port is reporting an error condition.
	• `Not Present`: The controller module is not installed or is down.
	• `Disconnected`: Either no I/O link is detected or the port is not cabled.
	`Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Reason`
	If Health is not `OK`, this field shows the reason for the health state.
	`Action`
	If Health is not `OK`, this field shows recommended actions to take to resolve the health issue.

Examples	Show the condition of SAS expansion-port connections in each enclosure. `# show sas-link-health`
Basetypes	expander-ports status

show schedules

Description	Shows information about all task schedules.
Minimum role	monitor

Syntax	`show schedules`
	`[detail]`
	`[schedule-name]`
	`detail`
	Optional. Shows additional detail about each schedule, with some longer field names, in a vertical format. If this parameter is omitted, output is shown with some shorter field names in a horizontal format.
	`schedule-name`
	Optional. Shows information about the specified schedule only. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all schedules.

Output	`Name`
	Shown by default. The schedule name.
	`Schedule Name`
	Shown by the detail parameter. The schedule name.
	`Specification`
	Shown by default. The schedule settings for running the associated task.
	`Schedule Specification`
	Shown by the detail parameter. The schedule settings for running the associated task.
	`Status`
	• `Uninitialized`: The task is not yet ready to run.
	• `Ready`: The task is ready to run at the next scheduled time.
	• `Suspended`: The task had an error and is holding in its current state.
	• `Expired`: The task exceeded a constraint and will not run again.
	• `Invalid`: The task is invalid.
	• `Deleted`: The task has been deleted.
	`Next Time`
	The date and time, in the format *year-month-day hour* : *minutes* : *seconds* (UTC), when the schedule will next run.
	`Task To Run`
	The name of the task that the schedule runs.
	`Error Message`
	• If an error occurred while processing the task, the error message.
	• Blank if no error occurred.
	Task-specific information, as shown by the set task command. Shown by the `detail` parameter.

Examples	Show information about all task schedules.

	`# show schedules`
	Show information about schedule `Sched2`.
	`# show schedules Sched2`

Basetypes	schedules status
See also	create schedule delete schedule set schedule show tasks

show sensor-status

Description	Shows information about each environmental sensor in each enclosure. Information shown includes overall unit (enclosure) status, and temperature, voltage, charge, and current as applicable for enclosure components. For temperature and voltage ranges (both normal and error), see your product's installation documentation.
Minimum role	monitor
Syntax	`show sensor-status`

Output	`Encl`
	The enclosure ID.
	`Drawer`
	The drawer ID.
	`Sensor Name`
	The sensor name and location.
	`Value`
	• For a sensor, its value.
	• For Overall Unit Status, one of the status values below.
	`Status`
	• `OK`: The sensor is present and detects no error condition.
	• `Warning`: The sensor detected a non-critical error condition. Temperature, voltage, or current is between the warning and critical thresholds.
	• `Critical`: The sensor detected a critical error condition. Temperature, voltage, or current exceeds the critical threshold.
	• `Unavailable`: The sensor is present with no known errors, but has not been turned on or set into operation because it is initializing. This typically occurs during controller startup.
	• `Unrecoverable`: The enclosure management processor (EMP) cannot communicate with the sensor.
	• `Unknown`: The sensor is present but status is not available.
	• `Not Installed`: The sensor is not present.
	• `Unsupported`: Status detection is not implemented.

Examples	Show the status of each environmental sensor in each enclosure. `# show sensor-status`
Basetypes	sensors

	status

show service-tag-info

Description	Shows the storage system's service tag identifier.
Minimum role	monitor
Syntax	`show service-tag-info`
Output	An alphanumeric string that uniquely identifies the product
Examples	Show the storage system's service tag. `# show service-tag-info`
Basetypes	service-tag-info status

show sessions

Description	Shows information about user sessions on the storage system. When an active session reaches its timeout (1800 seconds by default), the session will be marked as expired, and will be removed 30 seconds later. If you reset the system, all sessions will be removed. This information is for reference as a security measure.
Minimum role	manage

Syntax	`show sessions`
	`[detail]`
	`detail`
	Optional. Shows additional information about user sessions.

Output	`Username`
	The name of the user for which session information is shown.
	`Interface`
	Shows whether the session is using the CLI or the PowerVault Manager.
	`Locale`
	The display language.
	`Host`
	For a CLI session, the connected system's IP address and port number.
	`State`
	Shown by the `detail` parameter. Shows whether the session is active or expired.
	`Timeout`
	Shown by the `detail` parameter. The time in seconds that the session can be idle before it automatically ends.
	`Idle Time`
	The time in seconds that the session has been idle.
	`First Access`
	Shown by the `detail` parameter. The date and time when the session started.

	`Last Access` Shown by the `detail` parameter. The date and time when the session was last accessed. It updates to the current time when a command is issued.
Examples	Show active sessions on the storage system. `# show sessions`
Basetypes	sessions status

show shutdown-status

Description	Shows whether each Storage Controller is active or shut down.
Minimum role	monitor
Syntax	`show shutdown-status`

Output	`Controller A`
	• `up`: The controller is operational.
	• `down`: The controller is shut down.
	• `not installed`: The controller is not installed.
	`Controller B`
	• `up`
	• `down`
	• `not installed`
	`Other MC Status`
	The operational status of the Management Controller in the partner controller. This is not factored into system health
	• `Operational`
	• `Not Operational`
	• `Not Communicating`
	• `Unknown`

Examples	Show the shutdown status of each controller. `# show shutdown-status`
Basetypes	show-other-MC-status shutdown-status status
See also	restart mc restart sc shutdown

show snapshot-space

Description	Shows snapshot-space settings for each virtual pool. This includes space used by replication snapshots.
Minimum role	monitor

Syntax	`show snapshot-space`

Output	`Pool`
	The pool for which information is displayed (A or B).
	`Limit (%Pool)`
	The percentage of the pool that can be used for snapshots (the snapshot space).
	`Limit Size`
	The actual size of the snapshot space.
	`Allocated (%Pool)`
	The percentage of the pool currently used by snapshots.
	`Allocated (%Snapshot Space)`
	The percentage of the snapshot space currently used by snapshots.
	`Allocated Size`
	The actual amount of space currently used by snapshots.
	`Low Threshold (%Snapshot Space)`
	A percentage of the snapshot space designated as the low threshold.
	`Middle Threshold (%Snapshot Space)`
	A percentage of the snapshot space designated as the middle threshold.
	`High Threshold (%Snapshot Space)`
	A percentage of the snapshot space designated as the high threshold.
	`Limit Policy`
	The limit policy for when the percentage of the pool designated for snapshots is reached.
	• `notify-only`: When the snapshot space is reached an event is generated and logged.
	• `delete`: When the snapshot space is reached an event is generated and logged and automatic deletion of snapshots occurs.

Examples	Show snapshot-space settings for each virtual pool. `# show snapshot-space`
Basetypes	snap-space status
See also	set snapshot-space set snapshot-space

show snapshots

Description	Shows information about snapshots. The command will show information for all snapshots by default, or you can use parameters to filter the output.
Minimum role	monitor

Syntax	`show snapshots`
	`[pattern` *`string`*`]`
	`[pool` *`pool`*`]`
	`[type standard|replication|all]`
	`[volume` *`volume`*`]`

Parameters	`pattern string`

	Optional. Shows snapshots whose names contain the specified string. The string can include the following wildcards, singly or in combination. * Matches zero or more characters. ? Matches any one character. Use multiple '?' wildcards to find names of a specific length. For example, Vol?? will find names starting with Vol that are five characters long. [] Matches any character within the brackets, except a hyphen. Alphabetic characters are case sensitive. For example, [123] matches 1, 2, or 3. Use a hyphen between two characters to specify a range. For example, [0-9] matches any one digit. You can combine the list and range forms. For example, [xy1-3] matches x or y (but not X or Y), or 1, 2, or 3. pool *pool* Optional. Specifies the name or serial number of the pool that contains the snapshots for which to show information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for snapshots in all pools. type standard|replication|all Optional. Shows only standard snapshots, only replication snapshots, or snapshots of all types. If this parameter is omitted, snapshots of all types are shown. volume *volume* Optional. Shows snapshots associated with the specified volume name or serial number. A name that includes a space must be enclosed in double quotes.
Output	Pool The name of the pool that contains the snapshot. Serial Number Snapshot serial number Name The name of the snapshot. Creation Date/Time The date and time when the snapshot was prepared or committed. Status ● Available ● Unavailable: See the Status-Reason value. Status-Reason Shows N/A for Available status, or one of the following reasons for Unavailable status: ● snapshot not found ● master volume not found ● snapshot pending (not yet committed) ● master volume not accessible ● Volume copy with modified data is in progress ● Unknown reason Parent Volume The name of the volume of which the snapshot was taken. Base Vol The root of the snapshot tree, if any. A snapshot tree is a series of inter-related snapshots of a volume and can be 254 levels deep. Snaps The number of child snapshots (snapshots taken of this snapshot). TreeSnaps

	The number of snapshots taken of the base volume and its children. This count includes the base volume and all snapshots that share the base volume as their root.
	`Snap-Pool`
	Not applicable.
	`Snap Data`
	The total amount of write data associated with the snapshot.
	`Unique Data`
	The amount of write data that is unique to the snapshot.
	`Shared Data`
	The amount of write data that is shared between this snapshot and other snapshots.
	`Retention Priority`
	The retention priority for the snapshot.
	• `never-delete`: Snapshots will never be deleted.
	• `high`: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted.
	• `medium`: Snapshots may be deleted after all eligible low-priority snapshots have been deleted.
	• `low`: Snapshots may be deleted.
	Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion.

Examples	Show information about all snapshots.
	`# show snapshots`
	Show information about snapshots of volume `vol2`.
	`# show snapshots volume vol2`
	Show snapshots whose names include snap followed by an underscore and a two-digit number — such as `VolAsnap_01` or `snap_10`, but not `snapVolA_01` or `Snap_1`.
	`# show snapshots pattern *snap_[0-9][0-9]`

Basetypes	snapshots status
See also	show pools show volumes

show snmp-parameters

Description	Shows SNMP settings for event notification.
Minimum role	monitor
Syntax	`show snmp-parameters`

Output	`SNMP Trap Notification Level`
	• `crit`: Sends notifications for Critical events only.
	• `error`: Sends notifications for Error and Critical events.
	• `warn`: Sends notifications for Warning, Error, and Critical events.
	• `resolved`: Sends notifications for Resolved, Warning, Error, and Critical events.
	• `info`: Sends notifications for all events.
	• `none`: No events are sent as traps and traps are disabled.
	`SNMP Trap Host IP#`
	The IP address of each trap host. The value can be an IPv4 address, IPv6 address, or FQDN.

	`SNMP read community`
	The community string for read-only access. The value is obscured for users having only the monitor role and is shown in clear text for users having the manage role.
	`SNMP write community`
	The community string for write access. The value is obscured for users having only the monitor role and is shown in clear text for users having the manage role.

Examples	Show SNMP notification settings. `# show snmp-parameters`
Basetypes	snmp-parameters status
See also	set snmp-parameters set protocols show protocols

show support-assist

Description	Shows information about the SupportAssist feature.
Minimum role	monitor
Syntax	`show support-assist`

Output	SupportAssist status:
	`SupportAssist State`
	• `Running` – The service is enabled.
	• `Disabled` – The service is disabled
	• `Paused` – A user has temporarily suspended the service, preventing data transmission to the support server.
	`Operation Mode`
	• `Normal` – The service is operating normally.
	• `Maintenance` – Maintenance mode is automatically enabled during maintenance activities such as a firmware update or a user-initiated controller restart. In addition, a user can put the system into maintenance mode manually to notify SupportAssist not to create support tickets during planned system downtime.
	Specifies the status and date/time of the last transmission of system log data to the SupportAssist server.
	`Last Logs Send Status`
	`Last Logs Send Time`
	Specifies the status and date/time of the last transmission of system event data to the SupportAssist server.
	`Last Event Send Status`
	`Last Event Send Time`
	Proxy information:
	`Proxy State`
	• `Enabled` – Use of a proxy for HTTP communication is enabled.
	• `Disabled` – Use of a proxy for HTTP communication is disabled.
	`Host` – The IPv4 address or name of a proxy host.

	`Ports` – The port number to use on the proxy host. `Protocol` – The communication protocol: HTTP. `User Name` – The proxy user name to use to access the proxy server. Contact information: `Company Name, Company Country Territory, First Name, Last Name, Phone Number, Alternate Phone Number, Email Address, Alternate Email Address, Address Line1, Address Line2, Address Line3, Address City Town, Address Country Territory, Address State Province Region, Address Zip Postal Code, Time Zone, Preferred Contact Method, Preferred Contact Hours Start Time, Preferred Contact Hours End Time, Preferred Email Language, Preferred Email Language, Email Notifications`
Examples	Show information about the SupportAssist feature. `# show support-assist`
Basetypes	contact-information proxy-information support-assist status
See also	check support-assist send support-assist-logs set support-assist (for state and mode settings) set support-assist-info (for contact settings) set support-assist-proxy (for proxy settings)

show syslog-parameters

Description	Shows syslog notification parameters for events and managed log.
Minimum role	monitor
Syntax	`show syslog-parameters`

Output	`Syslog Host IP`
	The IP address or domain name of the remote syslog server used for the notifications.
	`Syslog Notification Level`
	Shows the minimum severity for which the system sends notifications:
	• `crit`: Sends notifications for Critical events only.
	• `error`: Sends notifications for Error and Critical events.
	• `warn`: Sends notifications for Warning, Error, and Critical events.
	• `resolved`: Sends notifications for Resolved, Warning, Error, and Critical events.
	• `info`: Sends notifications for all events.
	• `none`: Disables syslog notification and clears the settings.
	`Syslog Host Port`
	The port on which the remote syslog facility is expected to listen for notifications.

Examples	Show settings for remote syslog notification. `# show syslog-parameters`
Basetypes	syslog-parameters

	status
See also	set syslog-parameters

show system

Description	Shows information about the storage system. If the system health is not OK, each unhealthy component is listed with information to help you resolve the health problem.
Minimum role	monitor
Syntax	`show system` `[detail]`
Parameters	`detail` Optional. This parameter shows additional detail about the system.

Output	`System Name`
	The name of the system.
	`System Contact`
	The name of the person who administers the system.
	`System Location`
	The location of the system.
	`System Information`
	A brief description of what the system is used for or how it is configured.
	`Midplane Serial Number`
	The serial number of the controller enclosure midplane.
	`Vendor Name`
	The vendor name.
	`Product ID`
	The product model identifier.
	`Product Brand`
	The product brand name.
	`SCSI Vendor ID`
	Shown by the detail parameter. The vendor name returned by the SCSI INQUIRY command.
	`SCSI Product ID`
	Shown by the detail parameter. The product identifier returned by the SCSI INQUIRY command.
	`Enclosure Count`
	The number of enclosures in the system.
	`Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Reason`
	If Health is not `OK`, this field shows the reason for the health state.

	`Other MC Status`
	The operational status of the Management Controller in the partner controller. This is not factored into system health.
	• `Operational`
	• `Not Operational`
	• `Not Communicating`
	• `Unknown`
	`PFU Status`
	Shows whether partner firmware update is running on the system, or is idle.
	`Supported Locales`
	Supported display languages.

Examples	Show information about the system. `# show system`
Base types	system status
See also	set system show system-parameters

show system-parameters

Description	Shows certain storage-system settings and configuration limits. For a summary of the physical and logical limits of the storage system, see the “System configuration limits” topic in the PowerVault Manager help.
Minimum role	monitor
Syntax	`show system-parameters`

Output	`ULP Enabled`
	Shows that the system is using Unified LUN Presentation, which can expose all LUNs through all host ports on both controllers. The interconnect information is managed in the controller firmware. ULP appears to the host as an active-active storage system where the host can choose any available path to access a LUN regardless of disk group ownership. When ULP is in use, the system’s operating/cache-redundancy mode is shown as Active-Active ULP. ULP uses the T10 Technical Committee of INCITS Asymmetric Logical Unit Access (ALUA) extensions, in SPC-3, to negotiate paths with aware host systems. Unaware host systems see all paths as being equal.
	`Host Profiles Enabled`
	Shows whether host profiles are enabled.
	`Number of Host Ports`
	The number of host-interface ports in the controller enclosure.
	`Maximum Disks`
	The number of disks that the system supports.
	`Maximum Volumes`
	The number of volumes that the system supports.
	`Maximum Linear Disk Groups` (v3)
	The number of linear disk groups that the system supports.
	`Maximum Linear Vdisks` (v2)
	The number of disk groups that the system supports.

	`Maximum LUNs`
	The number of LUNs that the system supports.
	`Maximum Linear Disk Groups per Controller` (v3)
	The number of linear disk groups that each controller supports.
	`Maximum Linear Vdisks per Controller` (v2)
	The number of disk groups that each controller supports.
	`Maximum Virtual Pools per Controller`
	The number of virtual pools that each controller supports.
	`Maximum Virtual Disk Groups per Pool`
	The number of virtual pools that each pool can contain.
	`Maximum Virtual Pool Size`
	The maximum capacity of a virtual pool, formatted to use the current base, precision, and units.
	`Maximum Host Groups`
	The number of host groups that the system supports.
	`Maximum Hosts per Host Group`
	The maximum number of hosts that a host group can contain.
	`Maximum Initiators per Host`
	The maximum number of initiators that a host can contain.
	`Maximum Volume Groups per Controller`
	The maximum number of volume groups that each controller supports.
	`Maximum Volumes per Volume Group`
	The maximum number of volumes that a volume group can contain.
	`Local Controller`
	The ID of the controller you are accessing.
	`Serial Number`
	The last six digits of the midplane serial number.

Examples	Show settings and configuration limits for the storage system. `# show system-parameters`
Base types	system-parameters-table status
See also	show system

show tasks

Description	Shows information about tasks.
Minimum role	monitor

Syntax	`show tasks`
	`[detail] [task-name]`
	`detail`
	Optional. Shows additional detail about each task.
	`task-name`

	Optional. Shows information about the specified task only. If this parameter is omitted, information is shown for all tasks.

Output	**Any task type, no detail**
	`Name`
	The name of the task.
	`Type`
	The task type.
	`Status`
	The task status. Status values for each task type are listed in the following sections.
	`State`
	The current step of the task. State values for each task type are listed in the following sections.
	`Error Message`
	● If an error occurred while processing the task, the error message.
	● Blank if no error has occurred.
	TakeSnapshot task, detail
	`Task Name`
	The name of the task.
	`Task Type`
	`TakeSnapshot`
	`Status`
	● `Uninitialized`: The task is not yet ready to run.
	● `Ready`: The task is ready to run.
	● `Active`: The task is running.
	● `Error`: The task has an error.
	● `Complete`: For a TakeSnapshot task only, the task is complete but not yet ready to run again.
	● `Deleted`: The task is expired but this state is not yet synchronized to the partner controller.
	`Task State`
	The current step of the task:
	● `Start`
	● `VerifyVolume`
	● `CreateName`
	● `CreateSnap`
	● `VerifySnap`
	● `InspectRetention`
	● `FindOldestSnap`
	● `UnmapSnap`
	● `ResetSnap`
	● `RenameSnap`
	`Error Message`
	● If an error occurred while processing the task, the error message.
	● Blank if no error has occurred.
	`Source Volume`
	The name of the source volume.
	`Source Volume Serial`
	The serial number of the source volume.
	`Prefix`

The label that identifies snapshots created by this task.

`Retention Count`

The number of snapshots to retain with this prefix. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted.

`Last Created`

- The name of the last snapshot created by the task.
- Blank if the task has not taken a snapshot.

`Snapshot Name`

- The name of each snapshot taken.
- Blank if the task has not taken a snapshot.

`Snapshot Serial`

- The serial number of each snapshot taken.
- Blank if the task has not taken a snapshot.

ResetSnapshot task, detail

`Task Name`

The name of the task.

`Task Type`

TakeSnapshot

`ResetSnapshot`

`Status`

- `Uninitialized`: The task is not yet ready to run.
- `Ready`: The task is ready to run.
- `Active`: The task is running.
- `Error`: The task has an error.
- `Deleted`: The task is expired but this state is not yet synchronized to the partner controller.

`Task State`

The current step of the task:

- `Start`
- `VerifySnap`
- `UnmapSnap`
- `ResetSnap`

`Error Message`

- If an error occurred while processing the task, the error message.
- Blank if no error has occurred.

`Snapshot Name`

The name of the snapshot to reset.

`Snapshot Serial Number`

The serial number of the snapshot to reset.

VolumeCopy task, detail

`Task Name`

The name of the task.

`Task Type`

VolumeCopy

`Status`

- `Uninitialized`: The task is not yet ready to run.
- `Ready`: The task is ready to run.

- `Active`: The task is running.
- `Error`: The task has an error.
- `Deleted`: The task is expired but this state is not yet synchronized to the partner controller.

`Task State`

The current step of the task:

- Start
- VerifyVolume
- CreateName
- ObtainMap
- UnmapVolume
- CreateVolume
- RemapVolume
- VerifyCreatedVolume

`Error Message`

- If an error occurred while processing the task, the error message.
- Blank if no error has occurred.

`Source Volume`

The name of the volume to be copied.

`Source Volume Serial`

The serial number of the volume to be copied.

`Destination Pool`

The name of the pool in which the new volume will be created.

`Destination Pool Serial`

The serial number of the destination pool.

`Prefix`

The label that identifies copies created by this task.

`Modified Data`

- `modified`: The copy includes modified snapshot data.
- `preserved`: The copy excludes modified snapshot data

`Last Created`

- The name of the last volume created by the task.
- Blank if the task has not created a volume.

Replicate task, detail

`Task Name`

The name of the task.

`Task Type`

Replicate

`Status`

- `Uninitialized`: The task is not yet ready to run.
- `Ready`: The task is ready to run.
- `Active`: The task is running.
- `Error`: The task has an error.
- `Deleted`: The task is expired but this state is not yet synchronized to the partner controller.

`Task State`

The current step of the task:

- `Idle`
- `Replicate`
- `VerifyRunning`

	`Error Message`
	• If an error occurred while processing the task, the error message.
	• Blank if no error has occurred.
	EnableDSD task, detail
	`Task Name`
	The name of the task.
	`Task Type`
	EnableDSD
	`Status`
	• `Uninitialized`: The task is not yet ready to run.
	• `Ready`: The task is ready to run.
	• `Active`: The task is running.
	• `Error`: The task has an error.
	• `Deleted`: The task is expired but this state is not yet synchronized to the partner controller.
	`Task State`
	The current step of the task, which is always `Start`.
	`Error Message`
	• If an error occurred while processing the task, the error message.
	• Blank if no error has occurred.
	DisableDSD task, detail
	`Task Name`
	The name of the task.
	`Task Type`
	DisableDSD
	`Status`
	• `Uninitialized`: The task is not yet ready to run.
	• `Ready`: The task is ready to run.
	• `Active`: The task is running.
	• `Error`: The task has an error.
	• `Deleted`: The task is expired but this state is not yet synchronized to the partner controller.
	`Task State`
	The current step of the task, which is always Start.
	`Error Message`
	• If an error occurred while processing the task, the error message.
	• Blank if no error has occurred.

Examples	Show information about all tasks.
	`# show tasks`
	Show information about task `Task1`.
	`# show tasks Task1`

Basetypes	tasks status
See also	create schedule create task delete task set schedule

	set task show schedules

show tiers

Description	Shows information about tiers.
Minimum role	monitor
Syntax	`show tiers` `tier performance|standard|archive|readcache|all`
Parameters	`tier performance|standard|archive|readcache|all` Specifies the tier for which to show information.

Output	`Pool`
	The name of the pool.
	`Tier`
	The name of the tier.
	`% of Pool`
	The percentage of pool capacity that the tier occupies.
	`Disks`
	The number of disks in the tier.
	`Total Size`
	The total capacity of the tier.
	`Alloc Size`
	The amount of space currently allocated to volumes in the tier.
	`Available Size`
	The available capacity in the tier.
	`Affinity Size`
	The total size of volumes configured to have affinity for that tier.

Examples	Show information about all tiers.
	`# show tiers tier all`
	Show information about the Standard tier.
	`# show tiers tier standard`

Basetypes	tiers status
See also	show tier-statistics

show tier-statistics

Description	Shows live performance statistics for tiers. The command will show information for all tiers by default, or you can use parameters to filter the output. For tier performance statistics, the system samples live data every 30 seconds. Properties shown only in API format are described in API basetype properties

Minimum role	monitor

Syntax	`show tier-statistics`
	`[pool pool]`
	`tier performance|standard|archive|readcache|all`

Parameters	`pool pool`
	Optional. Specifies the name or serial number of the pool for which to show information. If this parameter is omitted, information is shown for all pools.
	`tier performance|standard|archive|readcache|all`
	Specifies the tier for which to show statistics.

Output	`Pool`
	The name of the pool.
	`Tier`
	The name of the tier.
	`Pages Allocated per Min`
	The rate, in pages per minute, at which pages are allocated to volumes in the tier because they need more space to store data.
	`Pages Deallocated per Min`
	The rate, in pages per minute, at which pages are deallocated from volumes in the tier because they no longer need the space to store data.
	`Pages Reclaimed`
	The number of 4 MB pages that have been automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).
	`Pages Unmapped per Minute`
	The number of 4 MB pages that host systems have unmapped per minute, through use of the SCSI UNMAP command, to free storage space as a result of deleting files or formatting volumes on the host.
	`Time Since Reset`
	The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.
	`Reads`
	The number of read operations since these statistics were last reset or since the controller was restarted.
	`Writes`
	The number of write operations since these statistics were last reset or since the controller was restarted.
	`Data Read`
	The amount of data read since these statistics were last reset or since the controller was restarted.
	`Data Written`
	The amount of data written since these statistics were last reset or since the controller was restarted.
	`Bps`
	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`IOPS`

	The number of input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`I/O Resp Time`
	The average response time, in microseconds, for read and write operations since the last sampling time.
	`Read Resp Time`
	Shown by the all parameter. The average response time, in microseconds, for read operations since the last sampling time.
	`Write Resp Time`
	Shown by the all parameter. The average response time, in microseconds, for write operations since the last sampling time.

Examples	Show statistics for all tiers.
	`# show tier-statistics tier all`
	Show statistics for the Standard tier in pool A.
	`# show tier-statistics pool A tier standard`

Base types	tier-statistics status
See also	reset all-statistics show pools show tiers

show unwritable-cache

Description	Shows the percentage of unwritable data in the system. This data has not been written to disk because it is associated with a volume that no longer exists or whose disks are not online. If the data is needed, the volume's disks must be brought online. If the data is not needed it can be cleared, in which case it will be lost and data will differ between the host and disk. **NOTE:** If you are uncertain whether to clear unwritable cache data, contact technical support for assistance.
Minimum role	monitor
Syntax	`show unwritable-cache`
Output	`Percent of unwritable cache in controller ID` The percentage of cache space occupied by unwritable data in the indicated controller module.
Examples	Show the percentage of unwritable cache data in each controller. `# show unwritable-cache`
Basetypes	unwritable-cache status
See also	clear cache

show users

Description	Shows configured user accounts.

Minimum role	monitor

Syntax	`show users`
	`[show-snmp-password]`
	`[user]`

Parameters	`show-snmp-password` Optional. Minimum role: manage. For SNMPv3 users, this parameter shows Password and Privacy Password values in clear text for reference when configuring users in the corresponding management application. If this parameter is omitted, password values are not displayed for security reasons. *user* Optional. Shows settings for the specified user only. If this parameter is omitted, settings are shown for all users.

Output	`Username`
	The user name.
	`Roles`
	● `monitor`: The user can view but not change system settings.
	● `manage`: The user can view and change system settings.
	● `diagnostic`: The user can view and change system settings.
	`User Type`
	The experience level of the user: Novice, Standard, Advanced, or Diagnostic. This parameter does not affect access to commands.
	`User Locale`
	The display language.
	`WBI`
	● `x`: The user can access the PowerVault Manager web-browser interface.
	● (blank): The user cannot access this interface.
	`CLI`
	● `x`: The user can access the command-line interface.
	● (blank): The user cannot access this interface.
	`FTP`
	● `x`: The user can access the FTP or SFTP interface.
	● (blank): The user cannot access this interface.
	`SMI-S`
	● `x`: The user can access the Storage Management Initiative Specification (SMI-S) interface.
	● (blank): The user cannot access this interface.
	`SNMP`
	● `U`: The user can access the SNMPv3 interface and view the MIB.
	● (blank): The user cannot access this interface.
	● `T`: The user can access the SNMPv3 interface and receive trap notifications.
	`Authentication Type`
	● `MD5`: MD5 authentication.
	● `SHA`: SHA-1 authentication.
	● none: No authentication.
	`Privacy Type`
	● `DES`: Data Encryption Standard.
	● `AES`: Advanced Encryption Standard.

	• none: No encryption.
	`Password`
	The user password. For a standard user the password is represented by eight asterisks. For an SNMPv3 user this is the authentication password.
	`Privacy Password`
	The encryption password for an SNMPv3 user whose privacy type is set to `DES` or `AES`.
	`Trap Host Address`
	SNMP trap destination for an SNMPv3 user that can receive trap notifications.

Examples	Show information about all users.
	`# show users`
	Show information about user `JSmith`.
	`# show users JSmith`
	As a user with the manage role, show information—including SNMP passwords—for SNMPv3 user `Traps`.
	`# show users Traps show-snmp-password`

Base types	users status
See also	create user delete user set user

show vdisks

Description	Shows information about all or specified linear disk groups. This command applies to linear storage only.
Minimum role	monitor
Syntax	`show vdisks` `[`*`vdisks`*`]`
Parameters	*`vdisks`* Optional. A comma-separated list of the names or serial numbers of the linear disk groups to show information about. A name that includes a space must be enclosed in double quotes.

Output	`Name`
	The name of the disk group.
	`Size`
	The size of the disk group.
	`Free`
	The amount of free (available) space in the disk group.
	`Own`
	Either the preferred owner during normal operation or the partner controller when the preferred owner is offline.
	`Pref`
	The controller that owns the disk group and its volumes during normal operation.

RAID

The disk-group RAID level.

Class

- Linear: The disk group acts as a linear pool.
- Virtual: The disk group is in a virtual pool.

Disks

The number of disks in the disk group.

Spr

The number of spares assigned to the disk group.

Chk

- For RAID levels except NRAID, RAID 1, and RAID 50, the configured chunk size for the disk group.
- For NRAID and RAID 1, chunk-size has no meaning and is therefore shown as not applicable (N/A).
- For RAID 50, the disk-group chunk size calculated as: *configured-chunk-size* x (*subgroup-members* - 1). For a disk group configured to use 64-KB chunk size and 4-disk subgroups, the value would be 192k (64KB x 3).

Status

- CRIT: Critical. The disk group is online but isn't fault tolerant because some of its disks are down.
- DMGD: Damaged. The disk group is online and fault tolerant, but some of its disks are damaged.
- FTDN: Fault tolerant with a down disk. The vdisk is online and fault tolerant, but some of its disks are down.
- FTOL: Fault tolerant and online.
- MSNG: Missing. The disk group is online and fault tolerant, but some of its disks are missing.
- OFFL: Offline. Either the disk group is using offline initialization, or its disks are down and data may be lost.
- QTCR: Quarantined critical. The vdisk is critical with at least one inaccessible disk. For example, two disks are inaccessible in a RAID-6 disk group or one disk is inaccessible for other fault-tolerant RAID levels. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined.
- QTDN: Quarantined with a down disk. The RAID-6 disk group has one inaccessible disk. The disk group is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined.
- QTOF: Quarantined offline. The disk group is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 disk group.
- STOP: The disk group is stopped.
- UNKN: Unknown.
- UP: Up. The disk group is online and does not have fault-tolerant attributes.

Jobs

Shows whether a job is running and its percent complete.

- DRSC: A disk is being scrubbed.
- EXPD: The disk group is being expanded.
- INIT: The disk group is initializing.
- RBAL: The ADAPT disk group is being rebalanced.
- RCON: At least one disk in the vdisk is being reconstructed.
- VDRAIN: The virtual disk group is being removed and its data is being drained to another disk group.
- VPREP: The virtual disk group is being prepared for use in a virtual pool.
- VRECV: The virtual disk group is being recovered to restore its membership in the virtual pool.
- VREMV: The disk group and its data are being removed.
- VRFY: The disk group is being verified.
- VRSC: The disk group is being scrubbed.
- Blank if no job is running.

	`Job%`
	• 0%-99%: Percent complete of running job
	• Blank if no job is running (job has completed)
	`Serial Number`
	The serial number of the disk group.
	`Spin Down`
	• `Disabled`: DSD is disabled for the disk group.
	• `Enabled` - all spinning: DSD is enabled for the disk group.
	• `Partial spin-down`: DSD is enabled for the disk group and its disks are partially spun down to conserve power.
	• `Full spin-down`: DSD is enabled for the disk group and its disks are fully spun down to conserve power.
	`SD Delay`
	For spinning disks in non-ADAPT disk groups, the period of inactivity after which the disk group's disks and dedicated spares will automatically spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.
	`Sec Fmt`
	The sector format of disks in the disk group.
	• `512n`: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes.
	• `512e`: All disks use 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.
	• `Mixed`: The disk group contains a mix of 512n and 512e disks. This is supported, but for consistent and predictable performance, do not mix disks of different rotational speed or sector size types (512n, 512e).
	`Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Reason`
	If Health is not `OK`, this field shows the reason for the health state.
	`Action`
	If Health is not `OK`, this field shows recommended actions to take to resolve the health issue.

Examples	Show information about all linear disk groups.
	`# show vdisks`
	Show information about linear disk group `vd0002`.
	`# show vdisks vd0002`

Base types	virtual-disks status
See also	create vdisk delete vdisks expand vdisk set vdisk

show vdisk-statistics

Description	Shows live or historical performance statistics for linear disk groups. This command applies to linear storage only. You can view live statistics for all or specified disk groups, or historical statistics for a specified disk group. For disk-group performance statistics, the system samples live data every 30 seconds and historical data every quarter hour, and retains historical data for 6 months. The historical option allows you to specify a time range or a number (count) of data samples to include. It is not recommended to specify both the time-range and count parameters. If both parameters are specified, and more samples exist for the specified time range, the samples' values will be aggregated to show the required number of samples. For each disk group these statistics quantify destages, read-aheads, and host reads that are cache misses. For example, each time data is written from a volume's cache to disks in the disk group that contains the volume, the disk group's statistics are adjusted. Properties shown only in API format are described in API basetype properties. **NOTE:** • Values for the amount of data transferred and for data throughput appear to be much higher in historical output than in live output. This is caused by a difference in the way that historical and live values are calculated. • Live values are calculated based on the vdisk as viewed from the controller cache perspective. In the live statistics, performance numbers are obtained by accounting for when data is written from cache to disk or is read from disk to cache. • Historical data is obtained by using the summation of the disk statistics for the disks in the vdisk. The historical vdisk data shows transfers to and from the disks in the vdisk that include the overhead of any RAID transfers as well as any host activity. • Because I/Os from the RAID engine are included, values for the historical data appear higher than the numbers for the live data.
Minimum role	monitor

Syntax	**To show live statistics:**
	`show vdisk-statistics`
	`[vdisks]`
	To show historical statistics:
	`show vdisk-statistics`
	`[all]`
	`[count number-of-data-samples]`
	`historical`
	`[time-range "date/time-range"]`
	`vdisk`

Parameters	`all`
	Optional. Specifies to show the full set of performance metrics. If this parameter is omitted, the default set of performance metrics will be shown.
	`count number-of-data-samples`
	Optional. Specifies the number of data samples to display, from 1 to 100. Each sample will be shown as a separate row in the command output. If this parameter is omitted, 100 samples will be shown. If you specify this parameter, do not specify the time-range parameter.
	`historical`
	Optional. Specifies to show historical statistics. If this parameter is omitted, live statistics will be shown.

	`[time-range "date/time-range"]`
	
	Optional. Specifies the date/time range of historical statistics to show, in the format "`start yyyy-mm-dd hh : mm[AM| PM] end yyyy-mm-dd hh : mm[AM|PM]`". If the start date/time is specified but no end date/time is specified, the current date/time will be used as the end date/time. The system will return the oldest sample taken after the start time and the latest sample taken before the end time. If the specified start date/time is earlier than the oldest sample, that sample will be used as the start date/time. If you specify this parameter, do not specify the count parameter. If this parameter is omitted, the most recent 100 data samples will be displayed.
	
	`vdisk`
	
	Specifies the name or serial number of one disk group for which to show historical statistics. A name that includes a space must be enclosed in double quotes.
	
	`vdisks`
	
	Optional. Specifies a comma-separated list of the names or serial number of disk groups for which to show live statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics will be shown for all disk groups.

Output	**Live**
	
	`Name`
	
	The name of the disk group.
	
	`Serial Number`
	
	The serial number of the disk group.
	
	`Bps`
	
	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	
	`IOPS`
	
	The input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	
	`Reads`
	
	The number of read operations since these statistics were last reset or since the controller was restarted.
	
	`Writes`
	
	The number of write operations since these statistics were last reset or since the controller was restarted.
	
	`Data Read`
	
	Amount of data read since these statistics were last reset or since the controller was restarted.
	
	`Data Written`
	
	The amount of data written since these statistics were last reset or since the controller was restarted
	
	`I/O Resp Time`
	
	The average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.
	
	`Read Resp Time`
	
	The average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.
	
	`Write Resp Time`
	
	The average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.
	
	`Reset Time`

	The date and time, in the format *yyyy-mm-dd hh* : *mm* : *seconds*, when these statistics were last reset, either by a user or by a controller restart.
	Historical
	`Name`
	The name of the disk group.
	`Serial Number`
	The serial number of the disk group.
	`Data Transferred`
	The total amount of data read and written since the last sampling time.
	`Total B/s`
	The data transfer rate, in bytes per second, for read and write operations since the last sampling time.
	`Sample Time`
	The date and time, in the format *yyyy-mm-dd hh* : *mm* : *seconds*, when the data sample was taken.
	Historical, all
	`Name`
	The name of the disk group.
	`Serial Number`
	The serial number of the disk group.
	`Data Transferred`
	The total amount of data read and written since the last sampling time.
	`Data Read`
	Shown by the all parameter. The amount of data read since the last sampling time.
	`Data Written`
	Shown by the all parameter. The amount of data written since the last sampling time.
	`Total B/s`
	The data transfer rate, in bytes per second, since the last sampling time. This is the sum of Read B/s and Write B/s.
	`Read B/s`
	Shown by the all parameter. The data transfer rate, in bytes per second, for read operations since the last sampling time.
	`Write B/s`
	Shown by the all parameter. The data transfer rate, in bytes per second, for write operations since the last sampling time.
	`Sample Time`
	The date and time, in the format *yyyy-mm-dd hh* : *mm* : *seconds*, when the data sample was taken.

Examples	Show live statistics for linear disk groups `VD1` and `MyVdisk`.
	`# show vdisk-statistics VD1,MyVdisk`
	Show historical statistics from a specified date and time range for linear disk group `VD2`.
	`# show vdisk-statistics VD2 historical time-range "start 2013-01-18 4:40 PM end 2013-01-18 5:00 PM"`
	Show all historical statistics (the latest 100 samples) for linear disk group `VD2`.
	`# show vdisk-statistics VD2 historical all`

Basetypes	vdisk-statistics (live)

	virtual-disk-summary (historical) vdisk-hist-statistics (historical) status
See also	reset all-statistics reset vdisk-statistics show vdisks

show versions

Description	Shows firmware and hardware version information for the system.
Minimum role	monitor

Syntax	`show versions`
	`[detail]`
	`[frus]`

Parameters	`detail`
	Optional. Shows information about the versions of firmware and hardware in each controller module. If this parameter is omitted, only firmware-bundle information is shown.
	`frus`
	Optional. Shows information about firmware versions for FRUs in each enclosure. If this parameter is omitted, only controller-module information is shown.

Examples	Show firmware-bundle version information for the system.
	`# show versions`
	Show detailed version information for each controller module.
	`# show versions detail`
	Show version information for FRUs in each enclosure.
	`# show versions frus`

Basetypes	versions expander-versions fru-versions status
See also	show inquiry

show volume-copies

Description	Shows information about in-progress copy volume operations.
Minimum role	monitor
Syntax	`show volume-copies`

Output	`Src Volume`
	The name of the source volume.
	`Src Type`

	The type of the source volume: `Virtual`
	`Src Pool`
	The name of the source pool: A or B.
	`Dest Volume`
	The name of the destination volume.
	`Dest Type`
	The type of the destination volume.
	`Dest Pool`
	The name of the destination pool: A or B.
	`Progress`
	The percent complete of the operation.

Examples	Show information about in-progress copy volume operations. `# show volume-copies`
Base types	copy-volumes status
See also	abort copy copy volume

show volume-groups

Description	Shows information about specified volume groups or all volume groups.
Minimum role	monitor
Syntax	`show volume-groups` `[`*`volume-groups`*`]`

Output	**Volume group information:**
	`Group Name`
	The name of the volume group.
	`Serial Number`
	The serial number of the volume group.
	`Type`
	The group type, which is Volume.
	`Number of Members`
	The number of volumes in the volume group.
	Volume information:
	`Pool`
	The name of the pool that contains the volume.
	`Name`
	The name of the volume.
	`Total Size`
	The total size of the volume.

	`Alloc Size`
	The amount of space currently allocated to a virtual volume, or the total size of a linear volume.
	`Class`
	• `Virtual`: The volume is in a virtual pool.
	`Type`
	• `base`: Base volume
	• `standard`: Standard volume
	`Health`
	• `OK`
	• `Degraded`
	• `Fault`
	• `N/A`
	• `Unknown`
	`Reason`
	If Health is not `OK`, this field shows the reason for the health state.
	`Action`
	If Health is not `OK`, this field shows recommended actions to take to resolve the health issue.

Examples	Show information about all volume groups.
	`# show volume-groups`
	Show information about volume groups `VGroup1` and `VGroup2`.
	`# show volume-groups VGroup1,VGroup2`

Base types	volume-groups volumes status
See also	create volume-group delete volume-groups set volume-group

show volume-names

Description	Shows volume names and serial numbers.
Minimum role	monitor
Syntax	`show volume-names` `[volumes]`
Parameters	`volumes` Optional. A comma-separated list of the names or serial numbers of the volumes for which to show information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all volumes

Output	`Name`
	The name of the volume.
	`Serial Number`
	The serial number of the volume.

Examples	Show volume names and serial numbers. `# show volume-names`
Base types	volume-names status
See also	show maps show volumes

show volume-reservations

Description	Shows persistent reservations for all or specified volumes. The persistent group reservations (PGR) mechanism enables application clients on multiple hosts to control access to a storage volume, and limits access by other hosts. Each host must be registered with the storage system in order to establish a persistent reservation for a volume, thereby becoming a reservation holder. If the system gets into an abnormal state and you need to remove all registrations and reservations for specified volumes to return them to a "clean" state, you can use the release volume command. This command must be used with care, as described in its help. For more information about persistent reservations, see the SPC-3 specification at https://www.t10.org/.
Minimum role	monitor
Syntax	`show volume-reservations` `[all|`**`volumes`**`]`

Output	Properties are described in alphabetical order.
	`Host ID`
	For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).
	`Key`
	The reservation key, shown as a hexadecimal value.
	`Name`
	The name of the volume.
	`PGR Generation`
	The generation of the volume reservation, shown as a hexadecimal value.
	`Ports`
	The controller host-port identifiers.
	`Reservation Type`
	• `Write Exclusive`: Write commands are only allowed for a single reservation holder.
	• `Exclusive Access`: Certain access (read, write) commands are only allowed for a single reservation holder.
	• `Write Exclusive` - Registrants Only: Write commands are only allowed for registered hosts. There is a single reservation holder.
	• `Exclusive Access` - Registrants Only: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder.
	• `Write Exclusive` - All Registrants: Write commands are only allowed for registered hosts. There is a single reservation holder.

	• `Exclusive Access` - All Registrants: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder.
	• `Undefined`: The volume has no persistent reservations.
	`Scope`
	The reservation scope, Logical Unit.
	`Serial Number`
	The serial number of the volume.
	`Volume Reserved`
	• `Free`: The volume is not reserved.
	• `Reserved`: The volume has been reserved by a host.

Examples	Show reservations for all volumes.
	`# show volume-reservations`
	Show reservations for volume `v1`.
	`# show volume-reservations v1`

Base types	volume-reservations status
See also	release volume show volumes

show volume-statistics

Description	Shows live performance statistics for all or specified volumes. For each volume these statistics quantify I/O operations between hosts and the volume. For example, each time a host writes to a volume's cache, the volume's statistics are adjusted. For volume performance statistics, the system samples live data every 15 seconds. Statistics shown only in API output are described in API basetype properties.
Minimum role	monitor
Syntax	`show volume-statistics` `[`*`volumes`*`]`
Parameters	*`volumes`* Optional. A comma-separated list of the names or serial numbers of the volumes for which to show information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all volumes.

Output	`Name`
	The name of the volume.
	`Serial Number`
	The serial number of the volume.
	`Bps`
	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`IOPS`

	The input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
	`Reads`
	The number of read operations since these statistics were last reset or since the controller was restarted.
	`Writes`
	The number of write operations since these statistics were last reset or since the controller was restarted.
	`Data Read`
	The amount of data read since these statistics were last reset or since the controller was restarted.
	`Data Written`
	The amount of data written since these statistics were last reset or since the controller was restarted.
	`Allocated Pages`
	The number of pages allocated to the volume.
	`% Performance`
	The percentage of volume capacity occupied by data in the Performance tier.
	`% Standard`
	The percentage of volume capacity occupied by data in the Standard tier.
	`% Archive`
	The percentage of volume capacity occupied by data in the Archive tier.
	`% RC`
	The percentage of read-cache capacity that is occupied.
	`Reset Time`
	The date and time, in the format *year - month - day hour : minutes :seconds*, when these statistics were last reset, either by a user or by a controller restart.

Examples	Show live performance statistics for all volumes.
	`# show volume-statistics`
	Show live performance statistics for volume `v0001`.
	`# show volume-statistics v0001`

Base types	volume-statistics status
See also	reset all-statistics reset volume-statistics show volumes

show volumes

Description	Shows information about volumes. The command will show information for all volumes by default, or you can use parameters to filter the output.
Minimum role	monitor
Syntax	`show volumes`

	[details] [pattern *string*] [pool **pool**] [type all|base|standard|snapshot|primary-volume|secondary-volume] [vdisk *vdisks*] [*volumes*]
Parameters	details Optional. Shows additional information about the volumes. pattern string Optional. Shows volumes whose names contain the specified string. The string can include the following wildcards, singly or in combination. * Matches zero or more characters. ? Matches any one character. Use multiple '?' wildcards to find names of a specific length. For example, Vol?? will find names starting with Vol that are five characters long. [] Matches any character within the brackets, except a hyphen. Alphabetic characters are case sensitive. For example, [123] matches 1, 2, or 3. Use a hyphen between two characters to specify a range. For example, [0-9] matches any one digit. You can combine the list and range forms. For example, [xy1-3] matches x or y (but not X or Y), or 1, 2, or 3. pool *pool* Optional. The name or serial number of the pool that contains the volumes for which to show information. type all|base|standard|snapshot|primary-volume|secondary-volume Optional. ● all: Show all volumes. ● base: Show only virtual volumes that are not snapshots of any other volume. ● snapshot: Show only snapshots. ● standard: Show only standard volumes. ● primary-volume: Show only primary volumes. ● secondary-volume: Show only secondary volumes. If this parameter is omitted, all volumes are shown. vdisk *vdisks* Optional. A comma-separated list of the names or serial numbers of the vdisks containing the volumes to show. A name that includes a space must be enclosed in double quotes. volumes Optional. A comma-separated list of the names or serial numbers of volumes for which to show information. A name that includes a space must be enclosed in double quotes.
Output	Properties are described in alphabetical order. Action If Health is not OK, this field shows recommended actions to take to resolve the health issue. Alloc Size The amount of space currently allocated to a virtual volume, or the total size of a linear volume. Cache Opt Shown by the details parameter. The cache optimization mode: ● standard: This controller cache mode of operation is optimized for sequential and random I/O and is the optimization of choice for most workloads. In this mode, the cache is kept coherent with the partner controller.

- `no-mirror`: In this mode of operation, the controller cache performs the same as the standard mode with the exception that the cache metadata is not mirrored to the partner. While this improves the response time of write I/O, it comes at the cost of redundancy. If this option is used, the user can expect higher write performance but is exposed to data loss if a controller fails.

`Class`

- `Linear`: The volume is in a linear pool.
- `Virtual`: The volume is in a virtual pool.

`Desc`

Shown by the `details` parameter. Blank if not set.

`Health`

- `OK`
- `Degraded`
- `Fault`
- `N/A`
- `Unknown`

`Large Virtual Extents`

For a virtual volume, this shows whether the system will try to allocate pages in a sequentially optimized way to reduce I/O latency and improve performance.

- `disabled` or `off`: Optimized page allocation is disabled. This is the default.
- `enabled` or `on`: Optimized page allocation is enabled.

`Name`

The name of the volume.

`Pool`

The name of the pool that contains the volume.

`Read Ahead`

Shown by the `details` parameter. The read-ahead cache setting:

- `Disabled`: Read-ahead is disabled.
- `Adaptive`: Adaptive read-ahead is enabled, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload.
- `Stripe`: Read-ahead is set to one stripe. The controllers treat NRAID and RAID-1 disk groups internally as if they have a stripe size of 512 KB, even though they are not striped.
- `512 KB`, `1 MB`, `2 MB`, `4 MB`, `8 MB`, `16 MB`, or `32 MB`: Size selected by a user.

`Reason`

If Health is not `OK`, this field shows the reason for the health state.

`Role`

Shown by the `details` parameter.

- `Copy Source`: The volume is the source for a volume copy operation.
- `Copy Destination`: The volume is the destination for a volume copy operation.
- `Primary`: The volume is the primary volume in a replication set.
- `Secondary`: The volume is the secondary volume in a replication set.
- (blank): Not applicable.

`Serial Number`

Shown by the details parameter. The serial number of the volume.

`Size`

The total size of the volume.

`Snap-Pool`

Shown by the `details` parameter. Not applicable.

`Snap Retention Priority`

	Shown by the `details` parameter. The retention priority for snapshots of the volume.
	• `never-delete`: Snapshots will never be deleted.
	• `high`: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted.
	• `medium`: Snapshots may be deleted after all eligible low-priority snapshots have been deleted.
	• `low`: Snapshots may be deleted.
	Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion.
	`Tier Affinity`
	Shown by the `details` parameter.
	• `No Affinity`: This setting uses the highest available performing tiers first and only uses the Archive tier when space is exhausted in the other tiers. Volume data will swap into higher performing tiers based on frequency of access and tier space availability.
	• `Archive`: This setting prioritizes the volume data to the least performing tier available. Volume data can move to higher performing tiers based on frequency of access and available space in the tiers.
	• `Performance`: This setting prioritizes volume data to the higher performing tiers. If no space is available, lower performing tier space is used. Performance affinity volume data will swap into higher tiers based upon frequency of access or when space is made available.
	`Total Size`
	The total size of the volume.
	`Type`
	• `base`: Base volume
	• `standard`: Standard volume
	`Vdisk`
	The name of the vdisk that contains the volume.
	`WR Policy`
	Shown by the `details` parameter. The cache write policy:
	• `write-back`: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput.
	• `write-through`: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance.
	`WWN`
	Shown by the `details` parameter. The World Wide Name of the volume

Examples	Show about all volumes.
	`# show volumes`
	Show detailed information for volume `volA`.
	`# show volumes details volA`
	Show volumes whose names start with `Vol` followed by any single character, an underscore, and a two-digit number — such as `VolA_01` or `Vol3_10`, but not `volA_01` or `Vol3_1`.
	`# show volumes pattern Vol?_[0-9][0-9]`

Basetypes	volumes status
See also	create volume delete volumes expand volume

	set volume show disk-groups show maps show pools show vdisks

shutdown

Description	Shuts down the Storage Controller in a controller module. This ensures that a proper failover sequence is used, which includes stopping all I/O operations and writing any data in write cache to disk. **CAUTION: Performing a shut down will cause data to be unavailable from the Storage Controller that is shut down. If the Storage Controller in each controller module is shut down, hosts cannot access the system's data.**
Minimum role	manage
Syntax	`Shutdown` `[a|b|both]`
Parameters	`a|b|both` Optional. Specifies to shut down the Storage Controller in controller A, B, or both. If this parameter is omitted, the command affects the controller being accessed.
Examples	Shut down the Storage Controller in controller `A`. `# shutdown a`
See also	restart mc restart sc show shutdown-status

suspend replication-set

Description	Suspends the replication operations for the specified replication set. This command applies to virtual storage only. You can run this command on the replication set's primary system. When you run this command, all replications in progress are paused and no new replications are allowed to start. During the suspension period, you can abort paused replications using the abort replication command. After you suspend replication, you must resume it using the resume replication-set command to allow the replication set to resume replications that were in progress and allow new replications to start. If replications are attempted during the suspended period (including scheduled replications), the replications will fail.
Minimum role	manage
Syntax	`suspend replication-set` **`replication-set-ID`**
Parameters	`replication-set-ID` The name or serial number of the replication set for which to suspend replication.
Examples	Suspend replications in replication set `RS1`.

	`# suspend replication-set RS1`
See also	abort replication create replication-set delete replication-set resume replication-set set replication-set show replication-sets

test

Description	Sends a test message to configured destinations for event notification and managed logs. After issuing this command, verify that the test message reached its destinations.
Minimum role	manage
Syntax	`test` `email|managedlogs|managedlogswarn|managedlogswrap|notification|snmp [region crash1|crash2|crash3|crash4|ecdebug|mc|scdebug]`

Output	`email|managedlogs|managedlogswarn|managedlogswrap|notification|snmp`
	• `email`: This option behaves the same as the notification option and remains for backward compatibility only.
	• `managedlogs`: Specify this option to test receipt of the managed-logs notification that logs need to be transferred. (Event 400)
	• `managedlogswarn`: Specify this option to test receipt of the managed-logs notification that logs are nearly full and must be transferred to avoid losing older entries. (Event 401)
	• `managedlogswrap`: Specify this option to test receipt of the managed-logs notification that logs have wrapped and older entries may be lost. (Event 402)
	• `notification`: Specify this option to test receipt of event-notification messages by every interface that is configured to receive them, such as email, SNMP, and SMI-S. (Event 312)
	• `snmp`: This option behaves the same as the notification option.
	`region crash1|crash2|crash3|crash4|ecdebug|mc|scdebug`
	Optional. For use with the managed logs feature, this parameter specifies the log type (debug-data region) for which to send notifications.
	• `crash1`, `crash2`, `crash3`, or `crash4`: Specify one of these options to send notification for one of the Storage Controller's four crash logs.
	• `ecdebug`: Specify this option to send notification for the Expander Controller log.
	• `mc`: Specify this option to send notification for the Management Controller log.
	• `scdebug`: Specify this option to send notification for the Storage Controller log, which includes the event log.
	If this parameter is omitted, the command sends four representative log types: `crash1`, `ecdebug`, `scdebug`, and `mc`.

Examples	Test receipt of event notifications by every interface that is configured to receive them.
	`# test notification`
	Test receipt of the managed-logs notification that the Storage Controller log needs to be transferred.
	`# test managedlogs region scdebug`

See also	set email-parameters set ntp-parameters

unmap volume

Description	Deletes explicit mappings or the default mapping for specified volumes. If you want to mask access for a specific initiator to a specific volume, use the map volume command and set the access parameter to `no-access`. **CAUTION: When a volume is unmapped from an initiator, the initiator will no longer be able to access the volume's data.**
Minimum role	manage

Syntax	To delete explicit mappings:
	`unmap volume`
	`[host hosts]`
	`initiator initiators|hosts|host-groups`
	`volumes|volume-groups`
	To delete the default mapping:
	`unmap volume`
	`volumes|volume-groups`

Parameters	`host hosts`
	Deprecated—use the initiator parameter instead.
	`initiator initiators|hosts|host-groups`
	A comma-separated list of initiators, hosts, or host groups for which to delete explicit mappings. For initiator, host, and host-group syntax, see Command syntax
	`volumes|volume-groups`
	A comma-separated list of volumes or volume groups to unmap. For a volume, specify its name or serial number. For a volume group, specify the name as *volume-group*.*. A name that includes a space must be enclosed in double quotes.

Examples	Delete explicit mappings for `Host1` to volumes `vol1` and `vol3` (leaving the default mappings, if any, unchanged).
	`# unmap volume initiator Host1.* vol1,vol3`
	Delete volume `vol2`'s default mapping (leaving explicit mappings, if any, unchanged).
	`# unmap volume vol2`
	Delete explicit mappings for initiator `FC-port1` to volume group `MyVolumes` (leaving the default mappings, if any, unchanged).
	`# unmap volume initiator FC-port1 MyVolumes.*.*`

See also	map volume show initiators show maps show volumes

verify disk-groups

Description	Analyzes redundant disk groups to find and fix inconsistencies between their redundancy data and their user data.

	This command acts on all disks in a disk group but not dedicated spares or leftover disks. This command will find and optionally fix parity mismatches for RAID 3, 5, 6, and 50, and find mirror mismatches for RAID 1 and 10. This command can be performed only on a disk group whose status is FTOL (fault tolerant and online). This command cannot be performed for NRAID or RAID 0. Verification can last over an hour, depending on disk-group size, utility priority, and amount of I/O activity. You can use a disk group while it is being verified. To view the progress of a verify (VRFY) job, use the show disk-groups command. When verification is complete, event 21 is logged and specifies the number of inconsistencies found. Such inconsistencies can indicate that a disk is going bad. **NOTE:** The scrub disk-groups command operates similarly to verify disk-groups and can find media errors for any RAID level, including NRAID and RAID 0.
Minimum role	manage

Syntax	`verify disk-groups`
	`[fix yes|no]`
	`disk-groups`

Parameters	`fix yes|no`
	Optional. Specifies whether or not to automatically fix parity mismatches by making parity match the data in all cases. The default is no. This parameter does not pertain to mirror mismatches, which are never automatically fixed because the system does not know which disk contains the "good" data.
	`disk-groups`
	A comma-separated list of the names or serial numbers of the disk groups to verify. A name that includes a space must be enclosed in double quotes.

Examples	Start verifying disk group `dg1`. `# verify disk-group dg1`
See also	abort verify scrub disk-groups show disk-groups

verify links

Description	Verifies FC or iSCSI host-port link paths between controller A and controller B.
Minimum role	manage
Syntax	`verify link` `[link-type FC|iSCSI|ALL]`
Parameters	`link-type FC|iSCSI|ALL` Optional. Specifies the type of host-port links to verify: • `FC`: Verify FC-to-FC links only. • `iSCSI`: Verify iSCSI-to-iSCSI links only. • `ALL`: Verify all FC-to-FC and iSCSI-to-iSCSI links. If this parameter is omitted, all links are verified.

Output	`Port`
	The port ID.
	`Type`

	• `FC`: FC port. • `iSCSI`: iSCSI port. • `Unknown`: Port type is unknown. `Links` The IDs of linked ports.
Examples	Verify all links between controllers A and B. `# verify links`

verify vdisk

Description	Analyzes redundant vdisks to find and fix inconsistencies between their redundancy data and their user data. This command applies to linear storage only. This command acts on all disks in a vdisk but not dedicated spares or leftover disks. This command will find and optionally fix parity mismatches for RAID 3, 5, 6, and 50, and mirror mismatches for RAID 1 and 10. This command can be performed only on a vdisk whose status is FTOL (fault tolerant and online). This command cannot be performed for NRAID or RAID 0. Verification can last over an hour, depending on vdisk size, utility priority, and amount of I/O activity. You can use a vdisk while it is being verified. To view the progress of a verify (VRFY) job, use the show vdisks command. When verification is complete, event 21 is logged and specifies the number of inconsistencies found. Such inconsistencies can indicate that a disk is going bad. **NOTE:** The scrub vdisk command operates similarly to verify vdisk and can find media errors for any RAID level, including NRAID and RAID 0.
Minimum role	manage

Syntax	`verify vdisk`
	`[fix yes|no]`
	`vdisks`

Parameters	`fix yes|no`
	Optional. Specifies whether or not to automatically fix parity mismatches by making parity match the data in all cases. The default is no.
	`vdisks`
	A comma-separated list of the names or serial numbers of the vdisks to verify. A name that includes a space must be enclosed in double quotes.

Examples	Start verifying vdisk `vd1`. `# verify vdisk vd1`
See also	abort verify scrub vdisk show vdisks verify disk-groups

4

API basetype properties

Chapter 3 describes command output that is shown in console format. This chapter describes the basetype properties that CLI commands display in API format, and is organized to help you find a basetype by name. This chapter excludes basetypes that are for internal use only.

Each basetype topic includes the following information:

- References to CLI commands that directly use the basetype.
- For each property, the values of its name and type elements, and a description of the values that the property may show. For descriptions of other elements see XML API elements.
- References to embedded or nested basetypes that the output may show.

adapt-expand-preview

Table 6. adapt-expand-preview properties

Name	Type	Description
name	string	The name of the disk group.
serial-number	string	Disk group serial number.
pool	string	The name of the pool that contains the disk group.
pool-serial-number	string	The serial number of the pool that contains the disk group.
type	string	Disk description. • `SAS`: Enterprise SAS spinning disk. • `SAS MDL`: Midline SAS spinning disk. • `SSD SAS`: SAS solid-state disk.
type-numeric	uint32	Numeric equivalents for `type` values. • `4`: SAS • `8`: SSD SAS • `11`: SAS MDL
size	string	Disk group capacity, formatted to use the current base, precision, and units.
size-numeric	uint64	Unformatted size value in blocks.
raidtype	string	The RAID level of the disk group. • NRAID • RAID0 • RAID1 • RAID3 • RAID5 • RAID6 • RAID10 • RAID50 • ADAPT
raidtype-numeric	unit32	Numeric equivalents for raidtype values • `0`: RAID0 • `1`: RAID1

Table 6. adapt-expand-preview properties (continued)

Name	Type	Description
		• 2: ADAPT • 3: RAID3 • 5: RAID5 • 6: NRAID • 8: RAID50 • 10: RAID10 • 11: RAID6 .
tier	string	• Archive: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • Performance: The disk group is in the highest storage tier, which uses SSDs (high speed). • Read Cache: The disk is an SSD providing high-speed read cache for a storage pool. • Standard: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).
tier-numeric	uint32	Numeric equivalents for storage-tier values. • 0: N/A • 1: Performance • 2: Standard • 4: Archive • 8: Read Cache
enclosure-id	string	Enclosure ID.
disk-count	uint32	Number of disks in the disk group.
disk-display	string	The disks that would be used, listed as hyphenated disk ranges where possible to aid readability (e.g., 1.1-12,...). If the list exceeds 60 characters, see the full list shown by disk-display-full.
disk-display-full	string	The disks that would be used, listed individually (e.g., 1.1,1.2,...).

advanced-settings-table

This basetype is used by show advanced-settings.

Table 7. advanced-settings-table properties

Name	Type	Description
background-scrub	string	Shows whether disks in disk groups are automatically checked for disk defects to ensure system health. The interval between a scrub finishing and starting again is specified by the background-scrub-interval parameter. • Disabled: Background disk-group scrub is disabled. • Enabled: Background disk-group scrub is enabled.
background-scrub-numeric	uint32	Numeric equivalents for background-scrub values. • 0: Disabled • 1: Enabled

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
background-scrub-interval	uint16	Shows the interval between background disk-group scrub finishing and starting again, from 0 to 360 hours.
partner-firmware-upgrade	string	Shows whether component firmware versions are monitored and will be automatically updated on the partner controller. • `Disabled`: Partner firmware upgrade is disabled. • `Enabled`: Partner firmware upgrade is enabled.
partner-firmware-upgrade-numeric	uint32	Numeric equivalents for `partner-firmware-upgrade` values. • `0`: Disabled • `1`: Enabled
utility-priority	string	Priority at which data-redundancy utilities, such as disk group verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect disk group background scrub, which always runs at “background” priority.) • `High`: Utilities have higher priority than host I/O. This can cause heavy I/O to be slower than normal. • `Medium`: Utility performance is balanced with host I/O performance. • `Low`: Utilities run at a slower rate with minimal effect on host I/O.
utility-priority-numeric	uint32	Numeric equivalents for `utility-priority` values. • `0`: High • `1`: Medium • `2`: Low
smart	string	Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks. • `Detect-Only`: Each disk in the system retains its individual SMART setting, as will new disks added to the system. • `Enabled`: SMART is enabled for all disks in the system and will be enabled for new disks added to the system. • `Disabled`: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.
smart-numeric	uint32	Numeric equivalents for `smart` values. • `0`: Detect-Only • `1`: Enabled • `2`: Disabled
dynamic-spares	string	Shows whether the storage system will automatically use a compatible disk as a spare to replace a failed disk in a disk group if no compatible spare is available. • `Disabled`: The dynamic spares feature is disabled. • `Enabled`: The dynamic spares feature is enabled.
emp-poll-rate	string	Shows the interval in seconds at which the storage system will poll each enclosure's Enclosure Management Processor (EMP) for status changes, from 5 to 3600 seconds.
host-cache-control	string	Shows whether hosts are allowed to use the SCSI `MODE SELECT` command to change the storage system's write-back cache setting. • `Disabled`: Host control of caching is disabled. • `Enabled`: Host control of caching is enabled.
host-cache-control-numeric	uint32	Numeric equivalents for `host-cache-control` values. • `0`: Disabled • `1`: Enabled
sync-cache-mode	string	Shows how the SCSI `SYNCHRONIZE CACHE` command is handled.

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
		• `Immediate`: Good status is returned immediately and cache content is unchanged. • `Flush To Disk`: Good status is returned only after all write-back data for the specified volume is flushed to disk.
sync-cache-mode-numeric	uint32	Numeric equivalents for `sync-cache-mode` values. • `0`: Immediate • `1`: Flush to Disk
independent-cache	string	Shows the cache redundancy mode for a dual-controller storage system. • `Disabled`: Controller failover is enabled and data in a controller's write-back cache is mirrored to the partner controller. • `Enabled`: The controllers use Independent Cache Performance Mode, in which controller failover is disabled and data in a controller's write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.
independent-cache-numeric	uint32	Numeric equivalents for `independent-cache` values. • `0`: Disabled • `1`: Enabled
missing-lun-response	string	Shows whether host drivers may probe for LUNs until the host drivers reach the LUN to which they have access. • `Not Ready`: Sends a reply that there is a LUN where a gap has been created but that it's "not ready." Sense data returned is sensekey = 2, code = 4, qualifier = 3. • `Illegal Request`: Sends a reply that there is a LUN but that the request is "illegal." Sense data returned is sensekey = 5, code = 25h, qualifier = 0.
missing-lun-response-numeric	uint32	Numeric equivalents for `missing-lun-response` values. • `0`: Not Ready • `1`: Illegal Request
controller-failure	string	Shows whether the cache policy will change from write-back to write-through when a controller fails. • `Disabled`: The controller failure trigger is disabled. • `Enabled`: The controller failure trigger is enabled.
controller-failure-numeric	uint32	Numeric equivalents for `controller-failure` values. • `0`: Disabled • `1`: Enabled
super-cap-failure	string	Shows whether the cache policy will change from write-back to write-through when the supercapacitor that provides backup power for cache is not fully charged or fails. • `Disabled`: The supercapacitor failure trigger is disabled. • `Enabled`: The supercapacitor failure trigger is enabled.
super-cap-failure-numeric	uint32	Numeric equivalents for `super-cap-failure` values. • `0`: Disabled • `1`: Enabled
compact-flash-failure	string	Shows whether the cache policy will change from write-back to write-through when CompactFlash memory is not detected during POST (Power-On Self-Test), fails during POST, or fails during controller operation. • `Disabled`: The CompactFlash failure trigger is disabled. • `Enabled`: The CompactFlash failure trigger is enabled.
compact-flash-failure-numeric	uint32	Numeric equivalents for compact-flash-failure values.

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
		• 0: Disabled • 1: Enabled
power-supply-failure	string	Shows whether the cache policy will change from write-back to write-through when a power supply fails. • Disabled: The power-supply failure trigger is disabled. • Enabled: The power-supply failure trigger is enabled.
power-supply-failure-numeric	uint32	Numeric equivalents for power-supply-failure values. • 0: Disabled • 1: Enabled
fan-failure	string	Shows whether the cache policy will change from write-back to write-through when a fan fails. • Disabled: The fan failure trigger is disabled. • Enabled: The fan failure trigger is enabled.
fan-failure-numeric	uint32	Numeric equivalents for fan-failure values. • 0: Disabled • 1: Enabled
temperature-exceeded	string	Shows whether the system will shut down a controller when its temperature exceeds the critical operating range. • Disabled: The over-temperature trigger is disabled. • Enabled: The over-temperature trigger is enabled.
temperature-exceeded-numeric	uint32	Numeric equivalents for temperature-exceeded values. • 0: Disabled • 1: Enabled
partner-notify	string	Shows whether the partner controller will be notified when a trigger condition occurs. • Disabled: Notification is disabled. The partner controller will continue using its current caching mode. • Enabled: Notification is enabled. The partner controller will change to write-through mode for better data protection.
partner-notify-numeric	uint32	Numeric equivalents for partner-notify values. • 0: Disabled • 1: Enabled
auto-write-back	string	Shows whether the cache policy will change from write-through to write-back when the trigger condition is cleared. • Disabled: Auto-write-back is disabled. • Enabled: Auto-write-back is enabled.
auto-write-back-numeric	uint32	Numeric equivalents for auto-write-back values. • 0: Disabled • 1: Enabled
disk-dsd-enable	string	Shows whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the disk-dsd-delay property. • Disabled: Drive spin down for available disks and global spares is disabled. • Enabled: Drive spin down for available disks and global spares is enabled.
disk-dsd-enable-numeric	uint32	Numeric equivalents for disk-dsd-enable values. • 0: Disabled • 1: Enabled

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
disk-dsd-delay	uint16	Specifies the period of inactivity in minutes after which spinning disks that are available or are global spares will spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.
background-disk-scrub	string	Shows whether disks that are not in disk groups are automatically checked for disk defects to ensure system health. The interval between background disk scrub finishing and starting again is 72 hours. • `Disabled`: Background disk scrub is disabled. • `Enabled`: Background disk scrub is enabled.
background-disk-scrub-numeric	uint32	Numeric equivalents for `background-disk-scrub` values. • `0`: Disabled • `1`: Enabled
managed-logs	string	Shows whether the managed logs feature is enabled, which allows log files to be transferred from the storage system to a log-collection system to avoid losing diagnostic data as logs fill. • `Disabled`: The managed logs feature is disabled. • `Enabled`: The managed logs feature is enabled.
managed-logs-numeric	uint32	Numeric equivalents for `managed-logs` values. • `0`: Disabled • `1`: Enabled
single-controller	string	For a system that had two controller modules but now has only one and is intended to be used as a single-controller system, this property shows whether the operating/redundancy mode is set to Single Controller. This prevents the system from reporting the absent partner controller as an error condition. This parameter does not affect any other system settings. Installing a second, functional controller module will change the mode to Active-Active ULP. • `Enabled`: Single Controller mode is enabled. • `Disabled`: Single Controller mode is disabled.
single-controller-numeric	uint32	Numeric equivalents for `single-controller` values. • `0`: Disabled • `1`: Enabled
auto-stall-recovery	string	Shows whether the auto stall recovery feature is enabled, which detects situations where a controller stall is preventing I/O operations from completing, and recovers the system so that at least one controller is operational, thus avoiding data-unavailability situations. • `Disabled`: Auto stall recovery is disabled. • `Enabled`: Auto stall recovery is enabled.
auto-stall-recovery-numeric	uint32	Numeric equivalents for `auto-stall-recovery` values. • `0`: Disabled • `1`: Enabled
restart-on-capi-fail	string	Shows whether a Storage Controller that experiences a CAPI hang will be forced to restart. A CAPI hang is perceived as a management-interface hang. As part of the restart process, a dump file is created and event 107 is logged. To provide the dump file to technical support for debugging, use the Save Logs action in the PowerVault Manager.
restart-on-capi-fail-numeric	uint32	Numeric equivalents for `restart-on-capi-fail` values. • `0`: Disabled • `1`: Enabled
large-pools	string	Shows whether the large-pools feature is enabled. This option provides the capability to create a virtual pool larger than 512 TiB on each controller by limiting the number of user-defined snapshots that can be created in snapshot trees.

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
		• `enabled or on`: The maximum size for a virtual pool will increase to 1024 TiB (1 PiB). The maximum number of volumes per snapshot tree will decrease to 9 (base volume plus 8 snapshots). • `disabled or off`: The maximum size for a virtual pool will increase to 512 TiB. The maximum number of volumes per snapshot tree will decrease to 255 (base volume plus 254 snapshots).
large-pools-numeric	uint32	Numeric equivalents for `large-pools` values. • `0`: Disabled • `1`: Enabled
random-io-performance-optimization	string	Shows whether random I/O performance optimization is enabled or disabled.
random-io-performance-optimization-numeric	uint32	• `0`: Disabled • `1`: Enabled
cache-flush-timeout	string	Shows whether the cache flush timeout is enabled or disabled.
cache-flush-timeout-numeric	uint32	• `0`: Disabled • `1`: Enabled

cache-parameter

This basetype is used by show cache-parameters, when a volume is specified, to show volume cache properties.

Table 8. cache-parameter properties

Name	Type	Description
serial-number	string	If a volume is specified, its serial number.
volume-name	string	If a volume is specified, its name.
write-policy	string	If a volume is specified, its cache write policy. • `write-back`: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput. • `write-through`: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance.
write-policy-numeric	uint32	Numeric equivalents for write-policy values. • `0`: write-through • `1`: write-back
cache-optimization	string	If a volume is specified, its cache optimization mode. • `standard`: This controller cache mode of operation is optimized for sequential and random I/O and is the optimization of choice for most workloads. In this mode, the cache is kept coherent with the partner controller. This mode gives you high performance and high redundancy. • `no-mirror`: In this mode of operation, the controller cache performs the same as the standard mode with the exception that the cache metadata is not mirrored to the partner. While this improves the response time of write I/O, it comes at the cost of redundancy. If this option is used, the user can expect higher write performance but is exposed to data loss if a controller fails.
cache-optimization-numeric	uint32	Numeric equivalents for `cache-optimization` values.

Table 8. cache-parameter properties (continued)

Name	Type	Description
		• 0: standard • 2: no-mirror
read-ahead-size	string	The read-ahead cache setting of the volume. • Disabled: Read-ahead is disabled. • Adaptive: Adaptive read-ahead is enabled, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload. • Stripe: Read-ahead is set to one stripe. The controllers treat NRAID and RAID-1 disk groups internally as if they have a stripe size of 512 KB, even though they are not striped. • 512 KB, 1 MB, 2 MB, 4 MB, 8 MB, 16 MB, or 32 MB: Size selected by a user.
read-ahead-numeric	uint32	Numeric equivalents for read-ahead-size values. • -2: Stripe • -1: Adaptive • 0: Disabled • 524288: 512 KB • 1048576: 1 MB • 2097152: 2 MB • 4194304: 4 MB • 8388608: 8 MB • 16777216: 16 MB • 33554432: 32 MB

cache-settings

This basetype is used by show cache-parameters to show system cache properties.

Table 9. cache-settings properties

Name	Type	Description
operation-mode	string	The operating mode of the system, also called the cache redundancy mode. • Independent Cache Performance Mode: For a dual-controller system, controller failover is disabled and data in the write-back cache if the controller is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache. • Active-Active ULP: Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance. • Single Controller: The enclosure contains a single controller. • Failed Over: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy. • Down: Both controllers are not operational.
operation-mode-numeric	uint32	Numeric equivalents for operation-mode values. • 1: Independent Cache Performance Mode • 2: Active-Active ULP • 3: Single Controller • 4: Failed Over • 5: Down
controller-cache-parameters	Embedded, see controller-cache-parameters	

certificate-status

This basetype is used by `show certificate`show certificate.

Table 10. certificate-status properties

Name	Type	Description
controller	string	• `A`: Controller A. • `B`: Controller B.
controller-numeric	uint32	Numeric equivalents for controller values. • `0`: A • `1`: B
certificate-status	string	• `Customer-supplied`: The controller is using a certificate that you have uploaded. • `System-generated`: The controller is using system-generated certificates. • `Unknown status`: The controller certificate cannot be read. This most often occurs when a controller is restarting or the certificate replacement process is still in process.
certificate- status-numeric	uint32	Numeric equivalents for `certificate-status` values. • `0`: Default • `1`: Customer-supplied
certificate-time	string	The date and time, in the format *`year-month-day hour:minutes:seconds`*, when the certificate was created.
certificate- signature	string	The first few characters of the certificate file. This property is for diagnostic purposes, and can be used to verify that the proper certificate is in use.
certificate-text	string	The full text of the certificate.

chap-records

This basetype is used by `show chap-records`.

Table 11. chap-records properties

Name	Type	Description
initiator-name	string	The originator name.
initiator-secret	string	The secret that the recipient uses to authenticate the originator.
oname	string	For mutual CHAP, the recipient name.
osecret	string	For mutual CHAP, the secret that the originator uses to authenticate the recipient.

cli-parameters

This basetype is used by `show cli-parameters`.

Table 12. cli-parameters properties

Name	Type	Description
timeout	uint32	Time in seconds that the session can be idle before it automatically ends. Valid values are 120–43200 seconds (2–720 minutes).

Table 12. cli-parameters properties (continued)

Name	Type	Description
output-format	string	• `console`: Supports interactive use of the CLI by displaying command output in easily readable format. This format automatically sizes fields according to content and adjusts content to window resizes. • `api`: Supports scripting by displaying command output in XML. All objects are displayed at the same level, related by COMP elements. • `api-embed`: Alternate form of XML output which displays “child” objects embedded (indented) under “parent” objects. • `ipa`: Alternate form of XML output which displays like api-embed format with brief mode enabled. • `ipa`: Alternate form of XML output which displays like api-embed format with brief mode enabled. • `json`: Standard JavaScript Object Notation (JSON) output. • `wbi`: A JSON-like format used internally by the PowerVault Manager.
output-format-api	string	• `console` • `api` • `api-brief` • `api-embed` • `api-embed-brief` • `json` • `json-full`
output-format-api- numeric	uint32	Numeric equivalents for `output-format-api` values. • `1`: console • `2`: api • `3`: api-brief • `4`: api-embed • `5`: api-embed-brief • `6`: json • `7`: json-full
brief-mode	string	• `Enabled`: In XML output, this setting shows a subset of attributes of object properties. The name and type attributes are always shown. • `Disabled`: In XML output, this setting shows all attributes of object properties.
brief-mode-numeric	uint32	Numeric equivalents for `brief-mode` values. • `0`: Disabled • `1`: Enabled
base	uint8	Alias for `storage-size-base`.
pager	string	• `Enabled`: Halts output after each full screen to wait for keyboard input. • `Disabled`: Output is not halted. When displaying output in API format, which is intended for scripting, disable paging.
pager-numeric	uint32	Numeric equivalents for `pager` values. • `0`: Disabled • `1`: Enabled
locale	string	The display language.
locale-numeric	uint32	Numeric equivalents for `locale` values. • `0`: English • `3`: Spanish • `4`: French

Table 12. cli-parameters properties (continued)

Name	Type	Description
		• 5: German • 7: Japanese • 8: Korean • 11: Chinese-simplified
storage-size-base	uint8	Base for entry and display of storage-space sizes. • 2: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude. • 10: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. Operating systems usually show volume size in base 2. Disk drives usually show size in base 10. Memory (RAM and ROM) size is always shown in base 2.
storage-size- precision	uint8	Number of decimal places (1–10) for display of storage-space sizes.
storage-size-units	string	Unit for display of storage-space sizes. • Auto: Lets the system determine the proper unit for a size. • MB: Sizes are shown in megabytes. • GB: Sizes are shown in gigabytes. • TB: Sizes are shown in terabytes. Based on the precision setting, if a size is too small to meaningfully display in the selected unit, the system uses a smaller unit for that size. For example, if storage-size-units is set to TB, storage-size-precision is set to 1, and storage-size-base is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.
storage-size- units-numeric	uint32	Numeric equivalents for storage-size-units values. • 0: Auto • 1: MB • 2: GB • 3: TB
temperature-scale	string	• Fahrenheit: Temperatures are shown in degrees Fahrenheit. • Celsius: Temperatures are shown in degrees Celsius.
temperature-scale- numeric	uint32	Numeric equivalents for temperature-scale values. • 0: Fahrenheit • 1: Celsius
user-type	string	The experience level of the logged-in user. • Novice • Standard • Advanced • Diagnostic
user-type-numeric	uint32	Numeric equivalents for user-type values. • 1: Novice • 2: Standard • 3: Advanced • 4: Diagnostic
username	string	The logged-in user name.
management-mode	string	The management mode used in the current CLI session. • Linear: Uses linear-storage terminology in command output and system messages. For example, *vdisk* for disk groups and pools.

Table 12. cli-parameters properties (continued)

Name	Type	Description
		• `Virtual`: Uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, *`disk group`* for disk groups and *`pool`* for pools.
management-mode-numeric	uint32	Numeric equivalents for `management-mode` values. • `2`: Linear • `3`: Virtual

cloud-iq

This basetype is used by `show cloud-iq`.

Table 13. chap-records properties

Name	Type	Description
cloud-iq	string	Shows whether the ability to remotely monitor the system by using the Dell EMC CloudIQ application is enabled or disabled. • `Enabled`: Use of the CloudIQ application is enabled. • `Disabled`: Use of the CloudIQ application is disabled.
cloud-iq-numeric	unit32	Numeric equivalents for `cloud-iq` values. • `0`: Disabled • `1`: Enabled
cloudiq-last-logssend-status	string	Specifies the status of the last transmission of storage system configuration data to the support server.
cloudiq-last-logssend-time	string	Specifies the date/time of the last transmission of storage system configuration data to the support server.
cloudiq-lastconfig-send-timenumeric	unit32	Unformatted `cloudiq-last-config-send-time` value.
cloudiq-last-perfsend-status	string	Specifies the status of the last transmission of storage system performance data to the support server.
cloudiq-last-perfsend-time	string	Specifies the date/time of the last transmission of storage system performance data to the support server.
cloudiq-last-perfsend-time-numeric	unit32	Unformatted `cloudiq-last-perf-send-time` value.

code-load-readiness

This basetype is used by `check firmware-upgrade-health` .

Table 14. code-load-readiness properties

Name	Type	Description
overall-health	string	• `Pass`: There are no risks to performing firmware upgrade. • `Fail`: At least one condition exists that presents a risk of upgrade failure or loss of availability.
overall-health-numeric	uint32	Numeric equivalents for `overall-health` values. • `0`: Pass • `1`: Fail
code-load-readiness-reasons	Embedded; see code-load-readiness-reasons.	

code-load-readiness-reasons

This basetype is used by `check firmware-upgrade-health` .

Table 15. code-load-readiness-reasons properties

Name	Type	Description
readiness-reason	string	The condition that was detected.
failure-risks	string	The problems that are likely to result if you do not resolve the conditions before performing a firmware upgrade.
failure-risks-numeric	uint32	Numeric equivalents for `failure-risks` values.

communication-ports

This basetype is used by `show protocols`.

Table 16. communication-ports properties

Name	Type	Description
ssh-port	uint16	The port number used for SSH.
sftp-port	uint16	The port number used for SFTP.

compact-flash

This basetype is used by `show controllers`.

Table 17. compact-flash properties

Name	Type	Description
durable-id	string	• `Ctlr A CF`: CompactFlash card in controller A. • `Ctlr B CF`: CompactFlash card in controller B.
controller-id	string	• `A`: Controller A. • `B`: Controller B.
controller-id-numeric	uint32	Numeric equivalents for `controller-id` values. • `0`: B • `1`: A
name	string	• `Controller A CompactFlash` • `Controller B CompactFlash`
status	string	• `Not Installed` • `Installed`
status-numeric	uint32	Numeric equivalents for `status` values. • `0`: Not Installed • `1`: Installed
cache-flush	string	• `Enabled`: If the controller loses power, it will automatically write cache data to the CompactFlash card. Cache flush is normally enabled, but is temporarily disabled during controller shut down. • `Disabled`: Cache flush is disabled.
cache-flush-numeric	uint32	Numeric equivalents for `cache-flush` values. • `0`: Disabled

Table 17. compact-flash properties (continued)

Name	Type	Description
		• `1`: Enabled
health	string	• `OK` • `Fault` • `N/A`
health-numeric	uint32	Numeric equivalents for `health` values. • `0`: OK • `2`: Fault • `4`: N/A
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended action to take to resolve the health issue.

contact-information

This basetype is used by `show support-assist`.

Table 18. contact-information properties

Name	Type	Description
company-name	string	The name of the customer.
company-country-territory	string	The country/territory code of the customer.
first-name	string	The first name of the customer contact.
last-name	string	The last name of the customer contact.
phone-number	string	The phone number of the customer contact.
alternate-phone-number	string	The alternate phone number of the customer contact.
email-address	string	The email address of the customer contact.
alternate-email-address	string	The alternate email address of the customer contact.
address-line1	string	The mailing address of the customer, including country/territory code.
address-line2	string	
address-line3	string	
address-city-town	string	
address-country-territory	string	
address-state-province-region	string	
address-zip-postal-code	string	
time-zone	string	The time zone of the customer.
preferred-contact-method	string	The preferred contact method: `email` or `phone`.
preferred-contact-hours-start-time	string	The preferred contact hours: `start` and `end`.
preferred-contact-hours-end-time	string	
preferred-email-language	string	The preferred email language.
email-notifications	string	• `Disabled`: Email notifications are disabled.

Table 18. contact-information properties (continued)

Name	Type	Description
		• `Enabled`: Email notifications are enabled.
email-notifications-numeric	uint32	Numeric equivalents for `email-notifications` values. • `0`: Disabled • `1`: Enabled

controller-cache-parameters

This basetype is used by `show cache-parameters`.

Table 19. controller-cache-parameters properties

Name	Type	Description
durable-id	string	• `cache-params-a`: Cache parameters for controller A. • `cache-params-b`: Cache parameters for controller B.
controller-id	string	• `A`: Controller A. • `B`: Controller B.
controller-id-numeric	uint32	Numeric equivalents for `controller-id` values. • `0`: B • `1`: A
name	string	• `Controller A Cache Parameters` • `Controller B Cache Parameters`
write-back-status	string	Shows the current, system-wide cache policy as determined by auto-write-through logic. This value is not settable by users. If an auto-write-through trigger condition (such as a CompactFlash failure) is met, the cache policy for all volumes changes to write-through, overriding the volume-specific settings. When the problem is corrected, the cache policy reverts to the value configured for each individual volume. • `Enabled`: Write-back. This is the normal state. • `Disabled`: Write-through. • `Not up`: The controller is not up.
write-back-status-numeric	uint32	Numeric equivalents for write-back-status values. • `0`: Enabled (write-back) • `1`: Disabled (write-through) • `2`: Not up
compact-flash-status	string	Numeric equivalents for `compact-flash-status` values. • `Not Installed`: The CompactFlash card is not installed. • `Installed`: The CompactFlash card is installed.
compact-flash-status-numeric	uint32	• `0`: Not Installed • `1`: Installed
compact-flash-health	string	• `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
compact-flash-health-numeric	uint32	Numeric equivalents for `compact-flash-health` values. • `0`: OK • `1`: Degraded

Table 19. controller-cache-parameters properties (continued)

Name	Type	Description
		• 2: Fault • 3: Unknown • 4: N/A
cache-flush	string	• Enabled: If the controller loses power, it will automatically write cache data to the CompactFlash card. Cache flush is normally enabled, but is temporarily disabled during controller shut down. • Disabled: Cache flush is disabled.
cache-flush-numeric	uint32	Numeric equivalents for cache-flush values. • 0: Disabled • 1: Enabled

controllers

This basetype is used by show configuration and show controllers.

Table 20. controllers properties

Name	Type	Description
durable-id	string	• controller a • controller b
controller-id	string	• A: Controller A. • B: Controller B.
controller-id-numeric	uint32	• 0: B • 1: A
serial-number	string	• Serial number of the controller module. • Not Available: The controller module is down or not installed.
hardware-version	string	Controller module hardware version.
cpld-version	string	Complex Programmable Logic Device (CPLD) firmware version.
mac-address	string	Controller network port MAC address.
node-wwn	string	Storage system World Wide Node Name (WWNN).
ip-address	string	Controller network port IP address.
ip-subnet-mask	string	Controller network port IP subnet mask.
ip-gateway	string	Controller network port gateway IP address.
ip6-link-local-address	string	The link-local IPv6 address.
ip6-auto-address	string	The automatically configured IPv6 address of the controller, when applicable.
ip61-address	string	First IPv6 address for the controller management port, if set.
ip62-address	string	Second IPv6 address for the controller management port, if set.
ip63-address	string	Third IPv6 address for the controller management port, if set.
ip64-address	string	Fourth IPv6 address for the controller management port, if set.
disks	uint32	Number of disks in the storage system.
number-of-storage-pools	uint32	Number of virtual pools in the storage system.
virtual-disks	uint32	Number of disk groups in the storage system.

Table 20. controllers properties (continued)

Name	Type	Description
cache-memory-size	uint32	Controller cache memory size (MB).
system-memory-size	uint32	Controller module cache memory size, in MB, including CPU memory available to I/O.
host-ports	uint32	Number of host ports in the controller module.
drive-channels	uint32	Number of expansion ports in the controller enclosure.
drive-bus-type	string	Controller interface to disks. • `SAS`
drive-bus-type-numeric	uint32	Numeric equivalent for drive-bus-type value. • `8`: SAS
status	string	• `Operational` • `Down` • `Not installed`
status-numeric	uint32	Numeric equivalents for status values. • `0`: Operational • `1`: Down • `2`: Not installed
failed-over	string	Indicates whether the partner controller has failed over to this controller. • `No`: The partner controller has not failed over to this controller. • `Yes`: The partner controller has either failed or been shut down, and its responsibilities have been taken over by this controller. There will be a delay between the time that the value of the `status` property becomes `Down` for one controller and the time that the value of the `failed-over property` becomes `Yes` for the other controller. This time period is the time that it takes for a controller to take over the responsibilities of its partner.
failed-over-numeric	uint32	Numeric equivalents for `failed-over` values. • `0`: No • `1`: Yes
fail-over-reason	string	If `failed-over` is `Yes`, a reason for the failover appears; otherwise, `Not applicable` appears.
fail-over-reason-numeric	uint32	Numeric equivalents for `fail-over-reason` values.
sc-fw	string	Storage Controller firmware version.
vendor	string	Controller manufacturer.
model	string	Controller model.
platform-type	string	Enclosure platform type.
platform-type-numeric	uint32	Numeric equivalents for `platform-type` values.
multicore	string	Shows whether the controller module is using multiple application processing cores. • `Enabled`: Multiple cores are active. • `Disabled`: A single core is active.
multicore-numeric	uint32	Numeric equivalents for `multicore` values. • `0`: Enabled • `1`: Disabled
sc-cpu-type	string	Storage Controller processor type.
sc-cpu-speed	sint32	Storage Controller processor speed.

Table 20. controllers properties (continued)

Name	Type	Description
internal-serial-number	string	Internal serial number of the controller.
cache-lock	string	Shows whether hosts are prevented from using the SCSI `MODE SELECT` command to change the write-back cache setting of the storage system. ● `No`: Hosts are permitted to disable write-back cache. ● `Yes`: Hosts are prevented from disabling write-back cache.
cache-lock-numeric	uint32	Numeric equivalents for `cache-lock` values. ● `0`: No ● `1`: Yes
write-policy	string	The current, system-wide cache policy as determined by auto-write-through (AWT) logic. This value is not settable by users. If an AWT trigger condition (such as a CompactFlash failure) is met, the cache policy for all volumes changes to write-through, overriding the volume-specific settings. When the problem is corrected, the cache policy reverts to the value configured for each individual volume. ● `write-back`: This is the normal state. ● `write-through` ● `Not up`: The controller is not up.
write-policy-numeric	uint32	Numeric equivalents for `write-policy` values. ● `0`: write-back ● `1`: write-through ● `2`: Not up
description	string	FRU long description.
part-number	string	Part number for the FRU.
revision	string	Hardware revision level for the FRU.
dash-level	string	FRU template revision number.
fru-shortname	string	FRU short description.
mfg-date	string	Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), when the PCBA of the controller was programmed.
mfg-date-numeric	uint32	Unformatted `mfg-date` value.
mfg-location	string	City, state/province, and country where the FRU was manufactured.
mfg-vendor-id	string	JEDEC ID of the FRU manufacturer.
locator-led	string	Shows the state of the locator LED on a controller module. ● `Off` ● `On`
locator-led-numeric	uint32	Numeric equivalents for locator-led values. ● `0`: Off ● `1`: On
ssd-alt-path-io-count	uint8	The ratio of I/Os that alternate between the primary path and the alternate path to the SSDs. Thus, `2` means every second I/O will go to the alternate path, or `3` means every third I/O will go to the alternate path.
health	string	● `OK` ● `Degraded` ● `Fault` ● `Unknown` ● `N/A`

Table 20. controllers properties (continued)

Name	Type	Description
health-numeric	uint32	Numeric equivalents for health values. • 0 : OK • 1: Degraded • 2: Fault • 3: Unknown • 4: N/A
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.
position	string	Position of the controller module, as viewed from the back of the enclosure. • Left • Right • Top • Bottom
position-numeric	uint32	Numeric equivalents for position values. • 0: Left • 1: Right • 2: Top • 3: Bottom
rotation	string	Rotation of the controller module in the enclosure. • 0 Degrees • 90 Degrees • 180 Degrees • 270 Degrees
rotation-numeric	string	Numeric equivalents for position values. • 0: 0 Degrees • 1: 90 Degrees • 2: 180 Degrees • 3: 270 Degrees
phy-isolation	string	Shows whether the automatic disabling of SAS expander PHYs having high error counts is enabled or disabled for this controller. • Enabled: PHY fault isolation is enabled. • Disabled: PHY fault isolation is disabled.
phy-isolation-numeric	uint32	Numeric equivalents for phy-isolation values. • 0: Enabled • 1: Disabled
redundancy-mode	string	The operating mode of the sytem, also called the cache redundancy mode. • Independent Cache Performance Mode: For a dual-controller system, controller failover is disabled and data in a controller's write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache. • Active-Active ULP: Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance. • Single Controller: The enclosure contains a single controller. • Failed Over: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy.
redundancy-mode-numeric	uint32	Numeric equivalents for redundancy-mode values.

Table 20. controllers properties (continued)

Name	Type	Description
		• 1: Independent Cache Performance Mode • 2: Active-Active ULP • 3: Single Controller • 4: Failed Over • 5: Down
redundancy-status	string	• Redundant with independent cache: Both controllers are operational but are not mirroring their cache metadata to each other. • Redundant: Both controllers are operational. • Operational but not redundant: In active-active mode, one controller is operational and the other is offline. In single-controller mode, the controller is operational. • Down: This controller is not operational. • Unknown: Status information is not available.
redundancy-status-numeric	uint32	Numeric equivalents for redundancy-status values. • 0: Operational but not redundant • 1: Redundant with independent cache • 3: Redundant • 4: Down • 5: Unknown
unhealthy-component	Embedded; see unhealthy-component.	
ip-address	Embedded; see network-parameters.	
port-details	Embedded; see port.	
enclosure-id	Embedded; see expander-ports.	
compact-flash	Embedded; see compact-flash.	
expander-details	Embedded; seeexpanders.	

controller-statistics

This basetype is used by `show controller-statistics`.

Table 21. controller-statistics properties

Name	Type	Description
durable-id	string	• controller a • controller b
cpu-load	uint32	Percentage of time the CPU is busy, from 0 to 100.
power-on-time	uint32	Number of seconds since the controller was restarted.
write-cache-used	uint32	Percentage of write cache in use, from 0 to 100.
bytes-per-second	string	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	uint64	Unformatted bytes-per-second value.
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

Table 21. controller-statistics properties (continued)

Name	Type	Description
number-of-reads	uint64	For the controller whose host ports had I/O activity, the number of read operations since these statistics were last reset or since the controller was restarted.
read-cache-hits	uint64	For the controller that owns the volume, the number of times the block to be read is found in cache.
read-cache-misses	uint64	For the controller that owns the volume, the number of times the block to be read is not found in cache.
number-of-writes	uint64	For the controller whose host ports had I/O activity, the number of write operations since these statistics were last reset or since the controller was restarted.
write-cache-hits	uint64	For the controller that owns the volume, the number of times the block written to is found in cache.
write-cache-misses	uint64	For the controller that owns the volume, the number of times the block written to is not found in cache.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	uint64	Unformatted `data-written` value.
num-forwarded-cmds	uint32	The current count of commands that are being forwarded or are queued to be forwarded to the partner controller for processing. This value will be zero if no commands are being forwarded or are queued to be forwarded.
reset-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	uint32	Unformatted `reset-time` value.
start-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling started for the `iops` and `bytes-per-second` values.
start-sample-time-numeric	uint32	Unformatted `start-sample-time` value.
stop-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling stopped for the `iops` and `bytes-per-second` values.
stop-sample-time-numeric	uint32	Unformatted `stop-sample-time` value.
total-power-on-hours	string	The total amount of hours the controller has been powered on in its life time.

copy-volumes

This basetype is used by `show volume-copies`.

Table 22. copy-volumes properties

Name	Type	Description
source-volume	string	The name of the source volume.
source-volume-serial	string	The serial number of the source volume.
source-type	string	The type of the source volume: `Virtual` or `Linear`.
source-type-numeric	uint32	Numeric equivalents for source-type values.

Table 22. copy-volumes properties (continued)

Name	Type	Description
		• 0: Linear • 1: Virtual
source-pool-name	string	The name of the source pool: A or B.
destination-volume	string	The name of the destination volume.
destination-volume-serial	string	The serial number of the destination volume.
destination-type	string	The type of the destination volume.
destination-type-numeric	uint32	Numeric equivalents for `destination-type` values. • 0: Linear • 1: Virtual
destination-pool-name	string	The name of the destination pool: `A` or `B`.
progress	string	The percent complete of the operation.

cs-replicate-tasks

This basetype is used by `show schedules`.

Table 23. cs-replicate-tasks properties

Name	Type	Description
replication-set-name	string	The name of the replication set.
replication-set-serialnum	string	The serial number of the replication set.
replicate-last-snapshot	string	• `False`: The primary volume will be replicated. • `True`: The most recent snapshot of the primary volume will be replicated.
replicate-last-snapshot-numeric	uint32	Numeric equivalents for replicate-last-snapshot values. • 0: False • 1: True

cs-replication

This basetype is used by `show replication-sets`.

Table 24. cs-replication-set properties

Name	Type	Description
replication-state	string	• `Last Run` • `Current Run`
replication-state- numeric	uint32	Numeric equivalents for `replication-state` values. • 0: Last Run • 1: Current Run
image-generation	sint32	The generation number of the replication. If the replication set is unsynchronized, which means the replication set is ready for replication but no replications have been performed, the value will be 0.
progress	string	The percentage complete of the active replication. Otherwise, N/A.
total-data- transferred	string	The total number of bytes transferred.

Table 24. cs-replication-set properties (continued)

Name	Type	Description
total-data- transferred-numeric	uint64	Unformatted `total-data-transferred` value.
collection-time	uint32	The date and time when the replication data shown by this command was collected.
collection-time- numeric	uint32	Unformatted `collection-time` value.
time-start	string	The date and time when the replication started.
time-start-numeric	uint32	Unformatted `time-start` value.
time-end	string	The date and time when the replication ended.
time-end-numeric	uint32	Unformatted `time-end` value.
estimated-time- completion	string	The date and time when the replication is estimated to end.
estimated-time- completion-numeric	uint32	Unformatted `estimated-time-completion` value.
most-recent- suspend-time	string	The most recent time that the replication was suspended.
most-recent- suspend-time-numeric	uint32	Unformatted `most-recent-suspend-time` value.
num-seconds- suspended	uint32	The amount of time, in seconds, that the replication was suspended.
suspend-count	uint32	The number of times the replication was suspended.
error-count	uint32	The number of times the replication experienced an error.
run-error	string	A message that says whether the replication succeeded or an error occurred.

cs-replication-set

This basetype is used by `show replication-sets` for a virtual replication set.

Table 25. cs-replication-set-properties

Name	Type	Description
name	string	The replication set name.
serial-number	string	The replication set serial number.
group	string	• `Yes`: The replication set is part of a group. • `No`: The replication set is not part of a group.
group-numeric	uint32	Numeric equivalents for group values. • `0`: No • `1`: Yes
primary-location	string	The location of the primary volume in the replication set: Local or Remote.
primary-location-numeric	uint32	Numeric equivalents for `primary-location` values. • `0`: Remote • `1`: Local
peer-connection-name	string	The name of the peer connection.
peer-connection-serial	string	The serial number of the peer connection.
primary-volume-name	string	The primary volume name. If it is a volume group, it uses the .* notation.
primary-volume-serial	string	The serial number of the primary volume.

Table 25. cs-replication-set-properties (continued)

Name	Type	Description
secondary-volume-name	string	The secondary volume name. If it is a volume group, it uses the .* notation.
secondary-volume-serial	string	The serial number of the secondary volume.
sync-job-active	string	• `False`: No replication is in progress on the replication set. • `True`: A replication is currently in progress on the replication set.
sync-job-active-numeric	uint32	Numeric equivalents for `sync-job-active` values. • `0`: False • `1`: True
queue-policy	string	The action to take when a replication is running and a new replication is requested. • `discard`: Discard the new replication request. • `queue-latest`: Take a snapshot of the primary volume and queue the new replication request. If the queue contained an older replication request, discard that older request. A maximum of one replication can be queued.
queue-policy-numeric	uint32	Numeric equivalents for `queue-policy` values. • `0`: none • `1`: discard • `2`: queue-latest
queue-count	uint8	The number of queued replications for the replication set: either 0 or 1.
snapshot-history	string	Specifies whether to maintain a replication snapshot history for the replication set. • `disabled` or `off`: A snapshot history will not be kept. • `secondary`: A snapshot history set will be kept on the secondary system for the secondary volume. • `both`: A snapshot history will be kept for the primary volume on the primary system and for the secondary volume on the secondary system.
snapshot-history-numeric	uint32	Numeric equivalents for `snapshot-history` values. • `0`: disabled • `1`: secondary • `2`: both
snapshot-count	uint32	The number of snapshots to retain in snapshot history. When a new snapshot exceeds this limit, the oldest snapshot in the snapshot history is deleted.
snapshot-basename	string	The user-defined prefix for the snapshots.
retention-priority	string	The retention priority for snapshots, which is used when automatic deletion of snapshots is enabled by using the set snapshot-space command. In a snapshot tree, only leaf snapshots can be deleted automatically. Deletion based on retention priority is unrelated to deleting the oldest snapshots to maintain a snapshot count. • `never-delete`: Snapshots will never be deleted automatically to make space. The oldest snapshot in the snapshot history will be deleted once the snapshot-count value has been exceeded. • `high`: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted. • `medium`: Snapshots can be deleted after all eligible low-priority snapshots have been deleted. • `low`: Snapshots can be deleted.
retention-priority-numeric	uint32	Numeric equivalents for `retention-priority-numeric` values. • `0`: never-delete • `1`: low

Table 25. cs-replication-set-properties (continued)

Name	Type	Description
		• 2: medium • 3: high
status	string	• Not Ready: The replication set is not ready for replications because the system is still preparing the replication set. • Unsynchronized: The primary and secondary volumes are unsynchronized because the system has prepared the replication set, but the initial replication has not run. • Running: A replication is in progress. • Ready: The replication set is ready for a replication. • Suspended: Replications have been suspended. • Unknown: This system cannot communicate with the primary system and thus cannot be sure of the current state of the replication set. Check the state of the primary system.
status-numeric	uint32	Numeric equivalents for status values.
failback-in-progress	string	Not supported.
failback-in-progress-numeric	uint32	Not supported.
failback-sync- complete	string	Not supported.
failback-sync-complete-numeric	uint32	Not supported.
last-success-time	string	The date and time when the system took a snapshot of the primary volume in preparation for starting the last successful replication run. The value shows when the primary and secondary volumes were last known to be in sync.
last-success-time-numeric	uint32	Unformatted last-success-time value.
last-success-generation	sint32	The number of times a replication has successfully completed.
last-run-status	string	The status of the last attempted replication. • N/A: The replication has not yet completed. • Success: The replication completed successfully. • Fail: The replication failed.
last-run-status-numeric	uint32	Numeric equivalents for last-run-status values. • 0: N/A • 1: Success • 2: Fail
estimated-time-completion	string	For the current run, the date and time when the replication is estimated to end. If no replication is in progress, N/A.
estimated-time-completion-numeric	uint32	Unformatted estimated-time-completion value.
previous-replication-run	Embedded; see cs-replication.	
current-replication-run	Embedded; see cs-replication.	
current-replication- snapshots	Embedded; see current-replication-snapshots.	

current-replication-snapshots

This basetype is used by show replication-snapshot-history.

Table 26. current-replication-snapshots properties

Name	Type	Description
serial-number	string	The snapshot serial number.
name	string	The snapshot name.
creation-date-time	string	The date and time when the snapshot was prepared or committed.
snap-data	blocks	The total amount of write data associated with the snapshot.
unique-data	blocks	The amount of write data that is unique to the snapshot.
base-volume	string	The base volume name.
base-serial-number	string	The base volume serial number.

disk-groups

This basetype is used by `show configuration`, `show disk-groups`, and `show pools`.

Table 27. disk-groups properties

Name	Type	Description
name	string	The name of the disk group.
url	string	Disk group URL.
blocksize	uint32	The size of a block, in bytes.
size	string	Disk group capacity, formatted to use the current base, precision, and units.
size-numeric	uint64	Unformatted `size` value in blocks.
freespace	string	The amount of free space in the disk group, formatted to use the current base, precision, and units.
freespace-numeric	uint64	Unformatted `freespace` value in blocks.
raw-size	string	The raw capacity of the disks in the disk group, irrespective of space reserved for RAID overhead and so forth, formatted to use the current base, precision, and units.
raw-size-numeric	uint64	Unformatted `raw-size` value in blocks.
storage-type	string	• `Linear`: The disk group acts as a linear pool. • `Virtual`: The disk group is in a virtual pool.
storage-type-numeric	uint32	Numeric equivalents for `storage-type` values. • `0`: Linear • `1`: Virtual
pool	string	The name of the pool that contains the disk group.
pools-url	string	Pool URL.
pool-serial-number	string	The serial number of the pool that contains the disk group.
storage-tier	string	• `Archive`: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • `Performance`: The disk group is in the highest storage tier, which uses SSDs (high speed). • `Read Cache`: The disk is an SSD providing high-speed read cache for a storage pool. • `Standard`: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).

Table 27. disk-groups properties (continued)

Name	Type	Description
storage-tier-numeric	uint32	Numeric equivalents for `storage-tier` values. • `0`: N/A • `1`: Performance • `2`: Standard • `4`: Archive • `8`: Read Cache
total-pages	uint32	For a virtual disk group, the total number of 4 MB pages it contains. For a linear disk group, 0.
allocated-pages	uint32	For a virtual pool, the number of 4 MB pages that are currently in use. For a linear pool, 0.
available-pages	uint32	For a virtual pool, the number of 4 MB pages that are still available to be allocated. For a linear pool, 0.
pool-percentage	uint8	The percentage of pool capacity that the disk group occupies.
performance-rank	uint8	Disk group performance rank within the virtual pool.
owner	string	Either the preferred owner during normal operation or the partner controller when the preferred owner is offline. • `A`: Controller A. • `B`: Controller B.
owner-numeric	uint32	Numeric equivalents for `owner` values. • `0`: B • `1`: A
preferred-owner	string	Controller that owns the disk group and its volumes during normal operation. • `A`: Controller A. • `B`: Controller B.
preferred-owner-numeric	uint32	Numeric equivalents for `preferred-owner` values. • `0`: B • `1`: A
raidtype	string	The RAID level of the disk group. • `NRAID` • `RAID0` • `RAID3` • `RAID5` • `RAID6` • `RAID10` • `RAID50` • `ADAPT`
raidtype-numeric	uint32	Numeric equivalents for `raidtype` values. • `0`: RAID0 • `1`: RAID1 • `2`: ADAPT • `3`: RAID3 • `5`: RAID5 • `6`: NRAID • `8`: RAID50 • `10`: RAID10 • `11`: RAID6

Table 27. disk-groups properties (continued)

Name	Type	Description
diskcount	uint16	Number of disks in the disk group.
sparecount	uint16	For a linear disk group, the number of spares assigned to the disk group. For a virtual disk group, 0.
chunksize	string	• For RAID levels except NRAID, RAID 1, and RAID 50, the chunk size for the disk group. • For NRAID and RAID 1, chunk-size has no meaning and is therefore shown as not applicable (N/A). • For RAID 50, the disk-group chunk size calculated as: *configured-chunk-size x (subgroup-members - 1)*. For a disk group configured to use 64-KB chunk size and 4-disk subgroups, the value would be 192k (64KB x 3).
status	string	• `CRIT`: Critical. The disk group is online but isn't fault tolerant because some of its disks are down. • `DMGD`: Damaged. The disk group is online and fault tolerant, but some of its disks are damaged. • `FTDN`: Fault tolerant with a down disk. The disk group is online and fault tolerant, but some of its disks are down. • `FTOL`: Fault tolerant and online. • `MSNG`: Missing. The disk group is online and fault tolerant, but some of its disks are missing. • `OFFL`: Offline. Either the disk group is using offline initialization, or its disks are down and data may be lost. • `QTCR`: Quarantined critical. The disk group is critical with at least one inaccessible disk. For example, two disks are inaccessible in a RAID-6 disk group or one disk is inaccessible for other fault-tolerant RAID levels. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined. • `QTDN`: Quarantined with a down disk. The RAID-6 disk group has one inaccessible disk. The disk group is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined. • `QTOF`: Quarantined offline. The disk group is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 disk group. • `STOP`: The disk group is stopped. • `UNKN`: Unknown. • `UP`: Up. The disk group is online and does not have fault-tolerant attributes.
status-numeric	uint32	Numeric equivalents for `status` values. • `0`: FTOL • `1`: FTDN • `2`: CRIT • `3`: OFFL • `4`: QTCR • `5`: QTOF • `6`: QTDN • `7`: STOP • `8`: MSNG • `9`: DMGD • `250`: UP • `other`:UNKN
lun	uint32	Deprecated.

Table 27. disk-groups properties (continued)

Name	Type	Description
min-drive-size	string	Minimum disk size that can this disk group can use, formatted to use the current base, precision, and units.
min-drive-size-numeric	uint64	Numeric equivalents for `min-drive-size` values.
create-date	string	Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), when the disk group was created.
create-date-numeric	uint32	Unformatted `create-date` value.
cache-read-ahead	string	Deprecated.
cache-read-ahead-numeric	uint64	Deprecated.
cache-flush-period	uint32	Deprecated.
read-ahead-enabled	string	Deprecated.
read-ahead-enabled-numeric	uint32	Deprecated.
write-back-enabled	string	Deprecated.
write-back-enabled-numeric	uint32	Deprecated.
job-running	string	Same as current-job.
current-job	string	Job running on the disk group, if any. • `DRSC`: A disk is being scrubbed. • `EXPD`: The disk group is being expanded. • `INIT`: The disk group is initializing. • `RBAL`: The ADAPT disk group is being rebalanced. • `RCON`: At least one disk in the disk group is being reconstructed. • `VDRAIN`: The virtual disk group is being removed and its data is being drained to another disk group. • `VPREP`: The virtual disk group is being prepared for use in a virtual pool. • `VRECV`: The virtual disk group is being recovered to restore its membership in the virtual pool. • `VREMV`: The disk group and its data are being removed. • `VRFY`: The disk group is being verified. • `VRSC`: The disk group is being scrubbed. • Blank if no job is running.
current-job-numeric	uint32	Numeric equivalents for current-job values. • `0`: (blank) • `2`: INIT • `3`: RCON • `4`: VRFY • `5`: EXPD • `6`: VRSC • `7`: DRSC • `9`: VREMV • `12`: VPREP • `13`: VDRAIN • `14`: VRECV • `16`: RBAL
current-job-completion	string	• `0%–99%`: Percent complete of running job. • (blank): No job is running (job has completed).
num-array-partitions	uint32	Number of volumes in the disk group.

Table 27. disk-groups properties (continued)

Name	Type	Description
largest-free-partition-space	string	The largest contiguous space in which a volume can be created. The value is formatted to use the current base, precision, and units.
largest-free-partition-space-numeric	uint64	Unformatted `largest-free-partition-space` value in blocks.
num-drives-per-low-level-array	uint8	• For a RAID-10 or RAID-50 disk group, the number of disks in each subgroup. • For other RAID levels, 1.
num-expansion-partitions	uint8	Not used.
num-partition-segments	uint8	Number of free segments available for expansion of volumes.
new-partition-lba	string	Maximum number of blocks that could be allocated to a newly created volume. The value is formatted to use the current base, precision, and units. Expanding a volume in the same disk group will reduce this amount.
new-partition-lba-numeric	uint64	Unformatted `new-partition-lba` value in blocks.
array-drive-type	string	Type of disks used in the disk group. • `SAS`: Enterprise SAS • `SAS MDL`: Midline SAS. • `sSAS`: SAS SSD. • `MIXED`: Mixture of enterprise SAS and midline SAS disks
array-drive-type-numeric	uint32	Numeric equivalents for `array-drive-type` values. • `1`: MIXED • `4`: SAS • `8`: sSAS • `11`: SAS MDL
disk-description	string	Disk description. • `SAS`: Enterprise SAS spinning disk. • `SAS MDL`: Midline SAS spinning disk. • `SSD SAS`: SAS solid-state disk.
disk-description-numeric	uint32	Numeric equivalents for description values. • `4`: SAS • `8`: SSD SAS • `11`: SAS MDL
is-job-auto-abortable	string	• `false`: The current job must be manually aborted before you can delete the disk group. • `true`: The current job will automatically abort if you delete the disk group.
is-job-auto-abortable-numeric	uint32	Numeric equivalents for `is-job-auto-abortable` values. • `0`: false • `1`: true
serial-number	string	Disk group serial number.
blocks	string	The number of blocks, whose size is specified by the `blocksize` property.
blocks-numeric	uint64	Unformatted blocks value.
disk-dsd-enable-vdisk	string	• `Disabled`: DSD is disabled for the disk group • `Enabled` - all spinning: DSD is enabled for the disk group. • `Partial spin-down`: DSD is enabled for the disk group and its disks are partially spun down to conserve power. • `Full spin-down`: DSD is enabled for the disk group and its disks are fully spun down to conserve power.

Table 27. disk-groups properties (continued)

Name	Type	Description
disk-dsd-enable-vdisk-numeric	uint32	Numeric equivalents for `disk-dsd-enable-vdisk` values. • `0`: Disabled • `1`: Enabled - all spinning • `2`: Partial spin-down • `3`: Full spin-down
disk-dsd-delay-vdisk	uint32	For spinning disks in a linear disk group, the period of inactivity after which the disks and dedicated spares will automatically spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.
adapt-target-spare-capacity	string	For an ADAPT disk group, the target spare capacity in GiB. Typically twice the capacity of the largest disk in the disk group.
adapt-target-spare-capacity-numeric	uint64	Unformatted `adapt-target-spare-capacity` value in blocks.
adapt-actual-spare-capacity	string	For an ADAPT disk group, the currently available spare capacity in GiB.
adapt-actual-spare-capacity-numeric	uint64	Unformatted `adapt-actual-spare-capacity` value in blocks.
adapt-critical-capacity	string	For an ADAPT disk group, the amount of storage space that is not currently protected against disk loss. (Normally all data is protected against loss of two disks.)
adapt-critical-capacity-numeric	uint64	Unformatted `adapt-critical-capacity` value in blocks.
adapt-degraded-capacity	string	For an ADAPT disk group, the amount of storage space that is protected against loss of a single disk only. (Normally all data is protected against loss of two disks.)
adapt-degraded-capacity-numeric	uint64	Unformatted `adapt-degraded-capacity` value in blocks.
adapt-linear-volume-boundary	uint32	The block size by which volumes are aligned in a linear ADAPT disk group. Disk group space is allocated in multiples of this size to such volumes.
pool-sector-format	string	The sector format of disks in the disk group. • `512n`: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes. • `512e`: All disks use 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries. • `Mixed`: The disk group contains a mix of 512n and 512e disks. This is supported, but for consistent and predictable performance, do not mix disks of different sector size types (512n, 512e).
pool-sector-format-numeric	uint32	Numeric equivalents for `pool-sector-format` values. • `0`: 512n • `1`: 512e • `3`: Mixed
health	string	• `OK` • `Degraded` • `Fault` • `Unknown` • `N/A`
health-numeric	uint32	Numeric equivalents for `health` values. • `0`: OK • `1`: Degraded

Table 27. disk-groups properties (continued)

Name	Type	Description
		• 2: Fault • 3: Unknown • 4 : N/A
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.
unhealthy-component	Embedded; see unhealthy-component.	

disk-groups-preview

This basetype is used by add storage when the preview parameter is specified.

Table 28. disk-groups-preview properties

Name	Type	Description
name	string	The name of the disk group.
pool	string	The name of the pool that contains the disk group.
type	string	Disk description. • SAS: Enterprise SAS spinning disk. • SAS MDL: Midline SAS spinning disk. • SSD SAS: SAS solid-state disk.
type-numeric	uint32	Numeric equivalents for description values. • 4: SAS • 8: SSD SAS • 11: SAS MDL
size	string	Disk group capacity, formatted to use the current base, precision, and units.
raidtype	string	The RAID level of the disk group. • NRAID • RAID0 • RAID3 • RAID5 • RAID6 • RAID10 • RAID50 • ADAPT
raidtype-numeric	uint32	Numeric equivalents for raidtype values. • 0 : RAID0 • 1 : RAID1 • 2 : ADAPT • 3: RAID3 • 5 : RAID5 • 6: NRAID • 8: RAID50 • 10: RAID10 • 11: RAID6
tier	string	• Archive: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity).

Table 28. disk-groups-preview properties (continued)

Name	Type	Description
		• `Performance`: The disk group is in the highest storage tier, which uses SSDs (high speed). • `Read Cache`: The disk is an SSD providing high-speed read cache for a storage pool. • `Standard`: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity)
tier-numeric	uint32	Numeric equivalents for storage-tier values. • `0`: N/A • `1`: Permance • `2`: Standard • `4`: Archive • `8`: Read Cache
enclosure-id	string	Enclosure ID.
disk-count	unit32	Number of disks in the disk group.
disk-display	string	The disks that would be used, listed as hyphenated disk ranges where possible to aid readability (e.g., 1.1-12,...). If the list exceeds 60 characters, see the full list shown by `disk-display-full`.
disk-display-full	string	The disks that would be used, listed individually (e.g., 1.1,1.2,...).

disk-group-statistics

This basetype is used by `show disk-group-statistics`.

Table 29. disk-group-statistics properties

Name	Type	Description
serial-number	string	The serial number of the disk group.
name	string	The name of the disk group.
time-since-reset	uint32	The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.
time-since-sample	uint32	The amount of time, in milliseconds, since this set of statistics was last sampled by the Storage Controller.
number-of-reads	uint64	Number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	Number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	uint64	Unformatted `data-written` value.
bytes-per-second	string	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	uint64	Unformatted `bytes-per-second` value.

Table 29. disk-group-statistics properties (continued)

Name	Type	Description
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
avg-rsp-time	uint32	Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.
avg-read-rsp-time	uint32	Average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.
avg-write-rsp-time	uint32	Average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.
disk-group-statistics-paged	Embedded; see disk-group-statistics-paged.	

disk-group-statistics-paged

This basetype is used by `show disk-group-statistics` for a virtual disk group.

Table 30. disk-group-statistics-paged properties

Name	Type	Description
serial-number	string	The serial number of the disk group.
pages-alloc-per-minute	uint32	The rate, in pages per minute, at which pages are allocated to volumes in the disk group because they need more space to store data.
pages-dealloc-per-minute	uint32	The rate, in pages per minute, at which pages are deallocated from volumes in the disk group because they no longer need the space to store data.
pages-reclaimed	uint32	The number of 4 MB pages that have been automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).
num-pages-unmap-per-minute	uint32	The number of 4 MB pages that host systems have unmapped per minute, through use of the SCSI `UNMAP` command, to free storage space as a result of deleting files or formatting volumes on the host.

disk-hist-statistics

This basetype is used by `show disk-statistics` when the `historical` parameter is specified.

Table 31. disk-hist-statistics properties

Name	Type	Description
number-of-ios	uint64	Total number of read and write operations since the last sampling time.
number-of-reads	uint64	Number of read operations since the last sampling time.
number-of-writes	uint64	Number of write operations since the last sampling time.
total-data-transferred	string	Total amount of data read and written since the last sampling time.
total-data-transferred-numeric	uint64	Unformatted `total-data-transferred` value.
data-read	string	Amount of data read since the last sampling time.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	Amount of data written since the last sampling time.
data-written-numeric	uint64	Unformatted data-written value.

Table 31. disk-hist-statistics properties (continued)

Name	Type	Description
total-iops	uint64	Total number of read and write operations per second since the last sampling time.
read-iops	uint64	Number of read operations per second since the last sampling time.
write-iops	uint64	Number of write operations per second since the last sampling time.
total-bytes-per-sec	string	Total data transfer rate, in bytes per second, since the last sampling time.
total-bytes-per-sec-numeric	uint64	Unformatted `total-bytes-per-second` value.
read-bytes-per-sec	string	Data transfer rate, in bytes per second, for read operations since the last sampling time.
read-bytes-per-sec-numeric	uint64	Unformatted `read-bytes-per-second` value.
write-bytes-per-sec	string	Data transfer rate, in bytes per second, for write operations last sampling time.
write-bytes-per-sec-numeric	uint64	Unformatted `write-bytes-per-second` value.
queue-depth	uint64	Average number of pending read and write operations being serviced since the last sampling time. This value represents periods of activity only and excludes periods of inactivity.
avg-rsp-time	uint64	Average response time, in microseconds, for read and write operations since the last sampling time.
avg-read-rsp-time	uint64	Average response time, in microseconds, for read operations since the last sampling time.
avg-write-rsp-time	uint64	Average response time, in microseconds, for write operations since the last sampling time.
avg-io-size	string	Average data size of read and write operations since the last sampling time.
avg-io-size-numeric	uint64	Unformatted `avg-io-size` value.
avg-read-io-size	string	Average data size of read operations since the last sampling time.
avg-read-io-size-numeric	uint64	Unformatted `avg-read-io-size` value.
avg-write-io-size	string	Average data size of write operations since the last sampling time.
avg-write-io-size-numeric	uint64	Unformatted `avg-write-io-size` value.
number-of-disk-errors	uint64	Total number of disk errors detected since the last sampling time. Error types include: number of SMART events; number of timeouts accessing the disk; number of times the disk did not respond; number of attempts by the storage system to spin-up the disk; media errors generated by the disk as specified by its manufacturer; non-media errors (generated by the storage system, or by the disk and not categorized as media errors); number of bad-block reassignments.
sample-time	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when the data sample was taken.
sample-time-numeric	uint32	Unformatted `sample-time` value.

disk-statistics

This basetype is used by `show disk-statistics` when the `historical` parameter is omitted.

Table 32. disk-statistics properties

Name	Type	Description
durable-id	string	Disk ID in the format `disk_`*`enclosure-number.disk-number`*.

Table 32. disk-statistics properties (continued)

Name	Type	Description
location	string	The disk location in the format `disk_enclosure-number.disk-number`.
serial-number	string	Disk serial number.
power-on-hours	uint32	The total number of hours that the disk has been powered on since it was manufactured. This value is stored in disk metadata and is updated in 30- minute increments.
bytes-per-second	string	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	uint64	Unformatted `bytes-per-second` value.
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
number-of-reads	uint64	Number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	Number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	uint64	Unformatted `data-written` value.
queue-depth	uint32	Number of pending I/O operations currently being serviced.
lifetime-data-read	string	The amount of data read from the disk in its lifetime.
lifetime-data-read-numeric	uint64	Unformatted `lifetime-data-read` value.
lifetime-data-written	string	The amount of data written to the disk in its lifetime.
lifetime-data-written-numeric	uint64	Unformatted `lifetime-data-written` value.
reset-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	uint32	Unformatted `reset-time` value.
start-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling started for the iops and bytes-per-second values.
start-sample-time-numeric	uint32	Unformatted `start-sample-time` value.
stop-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling stopped for the iops and bytes-per-second values.
stop-sample-time-numeric	uint32	Unformatted `stop-sample-time` value.
smart-count-1	uint32	For port 1, the number of SMART events recorded.
io-timeout-count-1	uint32	For port 1, the number of timeouts accessing the disk.
no-response-count-1	uint32	For port 1, the number of times the disk did not respond.
spinup-retry-count-1	uint32	For port 1, the number of attempts by the storage system to spin up the disk.
number-of-media-errors-1	uint32	For port 1, the number of media errors generated by the disk, as specified by its manufacturer.

Table 32. disk-statistics properties (continued)

Name	Type	Description
number-of-nonmedia-errors-1	uint32	For port 1, the number of other errors generated by the storage system, or generated by the disk and not categorized as media errors.
number-of-block-reassigns-1	uint32	For port 1, the number of times blocks were reassigned to alternate locations.
number-of-bad-blocks-1	uint32	For port 1, the number of bad blocks encountered.
smart-count-2	uint32	For port 2, the number of pending I/O operations currently being serviced.
io-timeout-count-2	uint32	For port 2, the number of SMART events recorded.
no-response-count-2	uint32	For port 2, the number of timeouts accessing the disk.
spinup-retry-count-2	uint32	For port 2, the number of times the disk did not respond.
number-of-media-errors-2	uint32	For port 2, the number of attempts by the storage system to spin up the disk.
number-of-nonmedia-errors-2	uint32	For port 2, the number of media errors generated by the disk, as specified by its manufacturer.
number-of-block-reassigns-2	uint32	For port 2, the number of other errors generated by the storage system, or generated by the disk and not categorized as media errors.
number-of-bad-blocks-2	uint32	For port 2, the number of times blocks were reassigned to alternate locations.

dns-parameters

This basetype is used by `show dns-parameters`.

Table 33. dns-parameters properties

Name	Type	Description
controller	string	• `A`: Controller A. • `B`: Controller B.
controller-numeric	uint32	• `0`: B • `1`: A
name-servers	string	The management host name of the controller.
search-domains	string	The controller FQDN or '-'.

drawers

This basetype is used by `show enclosures`.

Table 34. drawers properties

Name	Type	Description
durable-id	string	Drawer ID.
drawer-id (5U84 enclosure)	uint8	• `0`: Top • `1`: Bottom
drawer-id (2U12/24 enclosure)	uint8	Not applicable (`255`).
drawer-wwn	string	Drawer WWN.
part-number	string	Drawer part number.

Table 34. drawers properties (continued)

Name	Type	Description
name	string	Drawer name.
position	string	The drawer position in the enclosure, as viewed from the front. • `Left` • `Right` • `Top` • `Bottom`
position-numeric	uint32	Numeric equivalents for `position` values. • `0`: Left • `1`: Right • `2`: Top • `3`: Bottom
rows	uint8	Number of rows of disk slots.
columns	uint8	Number of columns of disk slots.
slots	uint8	Number of disk slots in drawer.
number-of-disks	uint8	Number of disk slots (not installed disks) in drawer.
emp-a-busid	string	SCSI channel ID of Enclosure Management Processor (EMP) A in the Expander Controller of a drawer.
emp-a-targetid	string	SCSI target ID of Enclosure Management Processor (EMP) A in the Expander Controller of a drawer.
emp-a-rev	string	Firmware revision of Enclosure Management Processor (EMP) A in the Expander Controller of a drawer.
emp-b-busid	string	SCSI channel ID of Enclosure Management Processor (EMP) B in the Expander Controller of a drawer.
emp-b-targetid	string	SCSI target ID of Enclosure Management Processor (EMP) B in the Expander Controller of a drawer.
emp-b-rev	string	Firmware revision of Enclosure Management Processor (EMP) B in the Expander Controller of a drawer.
emp-a	string	Shows the field name `EMP A` in console format.
emp-a-ch-id-rev	string	Channel ID and firmware revision of Enclosure Management Processor A in the Expander Controller of a drawer.
emp-b	string	Shows the field name `EMP B` in console format.
emp-b-ch-id-rev	string	Channel ID and firmware revision of Enclosure Management Processor B in the Expander Controller of a drawer.
locator-led	string	Shows the state of the locator LED on a drawer: • `Off` • `On`
locator-led-numeric	uint32	Numeric equivalents for locator-led values. • `0`: Off • `1`: On
status	string	Drawer status. • `Unsupported` • `OK` • `Critical` • `Warning`

Table 34. drawers properties (continued)

Name	Type	Description
		• `Unrecoverable` • `Not Installed` • `Unknown` • `Unavailable`
status-numeric	uint32	Numeric equivalents for status values. • `0`: Unsupported • `1`: OK • `2`: Critical • `3`: Warning • `4`: Unrecoverable • `5`: Not Installed • `6`: Unknown • `7`: Unavailable
extended-status	hex32	A numeric value that supplements the standard SES status shown by the `status` and `status-numeric` properties, and represents a specific condition.
health	string	• `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for health values. • `0`: OK • `1`: Degraded • `2`: Fault • `4`: N/A
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended actions to take to resolve the health issue.
unhealthy component	Embedded; see unhealthy-component.	
sideplane-details	Embedded; see sideplanes.	

drive-parameters

This basetype is used by `show disk-parameters`.

Table 35. drive-parameters properties

Name	Type	Description
smart	string	Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks. • `Detect-Only`: Each disk in the system retains its individual SMART setting, as will new disks added to the system. • `Enabled`: SMART is enabled for all disks in the system and will be enabled for new disks added to the system. • `Disabled`: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.
smart-numeric	uint32	Numeric equivalents for `smart` values. • `0`: Detect-Only

Table 35. drive-parameters properties (continued)

Name	Type	Description
		• 1: Enabled • 2: Disabled
drive-write-back-cache	string	• Disabled: Disk write-back cache is disabled for all disks in the system and will be enabled for new disks added to the system. This value cannot be changed.
drive-write-back-cache-numeric	uint32	Numeric equivalents for drive-write-back-cache values. • 2: Disabled
drive-timeout-retry-max	uint8	Maximum number of times a timed-out I/O operation can be retried before the operation is failed. This value cannot be changed.
drive-attempt-timeout	uint8	Number of seconds before an I/O operation is aborted and possibly retried. This value cannot be changed.
drive-overall-timeout	uint8	Total time in seconds before an I/O operation is failed regardless of the drive-attempt-timeout and drive-timeout-retry-max settings. This value cannot be changed.
disk-dsd-enable	string	Shows whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the disk-dsd-delay property. • Disabled: Drive spin down for available disks and global spares is disabled. • Enabled: Drive spin down for available disks and global spares is enabled.
disk-dsd-enable-numeric	uint32	Numeric equivalents for disk-dsd-enable values. • 0: Disabled • 1: Enabled
disk-dsd-delay	uint16	Shows the period of inactivity in minutes after which spinning disks that are available or are global spares will spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.

drive-summary

This basetype is used by `show disk-statistics` when the historical parameter is specified.

Table 36. drive-summary properties

Name	Type	Description
durable-id	string	Disk ID in the format disk_*enclosure-number.disk-number*.
serial-number	string	Disk serial number.
disk-hist-statistics	Embedded; see disk-hist-statistics.	

drives

This basetype is used by `show configuration` and `show disks`.

Table 37. drives properties

Name	Type	Description
durable-id	string	Disk ID in the format disk_*enclosure-ID.slot-number*.
enclosure-id	uint32	Enclosure ID.
drawer-id	uint8	• 0: Top

Table 37. drives properties (continued)

Name	Type	Description
(5U84 enclosure)		• 1: Bottom
drawer-id (2U12/24 enclosure)	uint8	Not applicable (255).
slot	uint32	Disk slot number.
location	string	Enclosure ID of the disk and slot number.
url	string	Disk URL.
port	uint32	For internal use only.
scsi-id	uint32	SCSI ID assigned to this disk for the primary channel.
blocksize	uint32	The size of a block, in bytes.
blocks	uint64	The number of blocks, whose size is specified by the blocksize property.
serial-number	string	Disk serial number.
vendor	string	Disk vendor.
model	string	Disk model.
revision	string	Disk firmware revision level.
secondary-channel	uint32	SCSI ID assigned to this disk for the secondary channel.
container-index	uint32	Container index.
member-index	uint32	Index for this disk in the disk group list.
description	string	Disk description. • SAS: Enterprise SAS spinning disk. • SAS MDL: Midline SAS spinning disk. • SSD SAS: SAS solid-state disk.
description-numeric	uint32	Numeric equivalents for description values. • 4: SAS • 8: SSD SAS • 11: SAS MDL
architecture	string	Disk architecture. • HDD • SSD
architecture-numeric	uint32	Numeric equivalents for architecture values. • 0: SSD • 1: HDD
interface	string	Disk interface. • SAS
interface-numeric	uint32	Numeric equivalents for interface values. • 0: SAS
single-ported	string	• Disabled: The disk has a dual-port connection to the midplane. • Enabled: The disk has a single-port connection to the midplane. **NOTE:** ME4 Series systems support only dual-ported disks.
single-ported-numeric	uint32	Numeric equivalents for single-ported values. • 0: Disabled

Table 37. drives properties (continued)

Name	Type	Description
		• 1: Enabled **NOTE:** ME4 Series systems support only dual-ported disks.
type	string	Type of disk. • SAS: Enterprise SAS. • SAS MDL: Midline SAS. • sSAS: SAS SSD.
type-numeric	uint32	Numeric equivalents for type values. • 4: SAS • 8: sSAS • 11: SAS MDL
usage	string	Shows the usage of the disk. • AVAIL: The disk is available. • DEDICATED SP: The disk is a spare assigned to a linear disk group. • FAILED: The disk is unusable and must be replaced. Reasons for this status include: excessive media errors, SMART error, disk hardware failure, or unsupported disk. • GLOBAL SP: The disk is a global spare. • LEFTOVR: The disk is a leftover. • LINEAR POOL: The disk is a member of a linear disk group. • UNUSABLE: The disk cannot be used in a disk group because the system is secured or the disk is locked to data access. • VDISK: The disk is a member of a linear disk group. • VDISK SP: The disk is a spare assigned to a linear disk group. • VIRTUAL POOL: The disk is a member of a disk group in a virtual pool.
usage-numeric	uint32	Numeric equivalents for usage values. • 0: AVAIL • 1: VDISK or LINEAR POOL • 2: VDISK SP or DEDICATED SP • 3: GLOBAL SP • 5: LEFTOVR • 7: FAILED • 8: UNUSABLE • 9: VIRTUAL POOL
smart-numeric	uint32	Numeric equivalents for smart values. • 0: Disabled • 1: Enabled
dual-port	uint32	• 0: Single-ported disk. • 1: Dual-ported disk. **NOTE:** ME4 Series systems support only dual-ported disks.
error	uint32	Not used.
fc-p1-channel	uint32	Port 1 channel ID.
fc-p1-device-id	uint32	Port 1 device ID.
fc-p1-node-wwn	string	Port 1 WWNN.
fc-p1-port-wwn	string	Port 1 WWPN.
fc-p1-unit-number	uint32	Port 1 unit number.

Table 37. drives properties (continued)

Name	Type	Description
fc-p2-channel	uint32	Port 2 channel number.
fc-p2-device-id	uint32	Port 2 device ID.
fc-p2-node-wwn	string	Port 2 WWNN.
fc-p2-port-wwn	string	Port 2 WWPN.
fc-p2-unit-number	uint32	Port 2 unit number.
drive-down-code	uint8	Numeric code indicating why the disk is down.
owner	string	Current owner, which is either the preferred owner during normal operation or the partner controller when the preferred owner is offline. • `A`: Controller A. • `B`: Controller B.
owner-numeric	uint32	Numeric equivalents for owner values. • `0`: B • `1`: A
index	uint32	For internal use only.
rpm	uint32	The speed of a spinning disk, in thousands of revolutions per minute, as specified by the disk vendor. For an SSD, 0 is shown.
size	string	Disk capacity, formatted to use the current base, precision, and units.
size-numeric	uint64	Unformatted `size` value in blocks.
sector-format	string	The disk sector format. • `512n`: The disk uses 512-byte native sector size. Each logical block and physical block is 512 bytes. • `512e`: The disk uses 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.
sector-format-numeric	uint32	Numeric equivalents for `sector-format` values. • `0`: 512n • `1`: 512e
transfer-rate	string	Disk data transfer rate in Gbit/s. It is normal behavior for the rate to vary. • `1.5` • `3.0` • `6.0` Some 6 Gbit/s disks might not consistently support a 6 Gbit/s transfer rate. If this happens, the controller automatically adjusts transfers to those disks to3 Gbit/s, increasing reliability and reducing error messages with little impact on system performance. This rate adjustment persists until the controller is restarted or power-cycled.
transfer-rate-numeric	uint32	For internal use only.
attributes	string	Shows which controller a single-ported disk is connected to. • `A`: Controller A. • `B`: Controller B. **NOTE:** ME4 Series systems support only dual-ported disks.
attributes-numeric	uint32	For internal use only.
enclosure-wwn	string	Enclosure WWN.
enclosures-url	string	Enclosure URL.

Table 37. drives properties (continued)

Name	Type	Description
status	string	Disk status. ● `Up`: The disk is present and is properly communicating with the expander. ● `Spun Down`: The disk is present and has been spun down by the drive spin down feature. ● `Warning`: The disk is present but the system is having communication problems with the disk LED processor. For disk and midplane types where this processor also controls power to the disk, power-on failure will result in Error status. ● `Error`: The disk is present but is not detected by the expander. ● `Unknown`: Initial status when the disk is first detected or powered on. ● `Not Present`: The disk slot indicates that no disk is present. ● `Unrecoverable`: The disk is present but has unrecoverable errors. ● `Unavailable`: The disk is present but cannot communicate with the expander. ● `Unsupported`: The disk is present but is an unsupported type.
recon-state	string	The state of the disk (source or destination) if it is involved in a reconstruct operation. ● `From`: This disk is being used as the source of a reconstruct operation. ● `To`: This disk is being used as the target of a reconstruct operation. ● `N/A`: This disk is not being used in a reconstruct operation.
recon-state-numeric	uint32	Numeric equivalents for `recon-state` values. ● `0`: N/A ● `1`: From ● `2`: To
disk-dsd-count	uint32	Number of times the DSD feature has spun down this disk.
spun-down	uint32	Shows whether the disk is spun down by the DSD feature. ● `0`: Not spun down. ● `1`: Spun down.
number-of-ios	uint64	Total number of I/O operations (reads and writes).
total-data-transferred	string	The total number of bytes transferred.
total-data-transferred-numeric	uint64	Unformatted `total-data-transferred` value.
avg-rsp-time	uint64	Average I/O response time in microseconds.
fde-state	string	The FDE state of the disk. ● `Unknown`: The FDE state is unknown. ● `Not FDE Capable`: The disk is not FDE-capable. ● `Not Secured`: The disk is not secured. ● `Secured, Unlocked`: The system is secured and the disk is unlocked. ● `Secured, Locked`: The system is secured and the disk is locked to data access, preventing its use. ● `FDE Protocol Failure`: A temporary state that can occur while the system is securing the disk.
fde-state-numeric	uint32	Numeric equivalents for `fde-state` values. ● `0`: Not FDE Capable ● `1`: Not Secured ● `2`: Secured, Unlocked ● `3`: Secure, Locked ● `4`: FDE Protocol Failure ● `5`: Unknown

Table 37. drives properties (continued)

Name	Type	Description
lock-key-id	string	Current lock ID, or `00000000` if not set.
import-lock-key-id	string	Import lock ID, or `00000000` if not set.
fde-config-time	string	If the system is secured, the time at which the current lock ID was set in the format `year-month-day hour:minutes:seconds` (UTC). Otherwise, N/A.
fde-config-time-numeric	uint32	Unformatted `fde-config-time` value.
temperature	string	Temperature of the disk.
temperature-numeric	uint32	Numeric equivalent for the `temperature` value.
temperature-status	string	• `OK`: The disk sensor is present and detects no error condition. • `Warning`: The disk sensor detected a non-critical error condition. The temperature is between the warning and critical thresholds. • `Critical`: The disk sensor detected a critical error condition. The temperature currently exceeds the critical threshold. • `Unknown`: The disk sensor is present but status is not available.
temperature-status-numeric	uint32	Numeric equivalents for `temperature-status` values. • `1`: OK • `2`: Critical • `3`: Warning • *`other`*: Unknown
power-on-hours	unit32	The total number of hours that the disk has been powered on since it was manufactured. This value is stored in disk metadata and is updated in 30- minute increments.
extended-status	uint64	A numeric value that supplements the standard SES status shown by the `status` and `status-numeric` properties, and represents a specific condition. • `0x00000000`: OK • `0x00000001`: Single-pathed, A down • `0x00000002`: SSD exhausted • `0x00000004`: Degraded warning • `0x00000008`: Spun down • `0x00000010`: Downed by user • `0x00000020`: Reconstruction failed • `0x00000040`: Leftover, no reason • `0x00000080`: Previously missing • `0x00000100`: Medium error • `0x00000200`: SMART event • `0x00000400`: Hardware failure • `0x00000800`: Foreign disk unlocked • `0x00001000`: Non-FDE disk • `0x00002000`: FDE protocol failure • `0x00004000`: Using alternate path • `0x00008000`: Initialization failed • `0x00010000`: Unsupported type • `0x00040000`: Recovered errors • `0x00080000`: Unexpected leftover • `0x00100000`: Not auto-secured • `0x00200000`: SSD nearly exhausted • `0x00400000`: Degraded critical • `0x00800000`: Single-pathed, B down • `0x01000000`: Foreign disk secured

Table 37. drives properties (continued)

Name	Type	Description
		• 0x02000000: Foreign disk secured and locked • 0x04000000: Unexpected usage • 0x08000000: Enclosure fault sensed • 0x10000000: Unsupported block size • 0x20000000: Unsupported vendor • 0x40000000: Timed-out • 0x200000000: Preemptive pending degraded
health	string	Disk health. • OK • Degraded • Fault • Unknown • N/A
health-numeric	uint32	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown • 4: N/A
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.

email-parameters

This basetype is used by show email-parameters.

Table 38. email-parameters properties

Name	Type	Description
email-notification	string	Shows whether email (SMTP) notification of events is enabled. • Disabled: Email notification is disabled. • Enabled: Email notification is enabled.
email-notification-numeric	uint32	Numeric equivalents for email-notification values. • 0: Disabled • 1: Enabled
email-notification-filter	string	The minimum severity for which the system should send notifications: • crit: Sends notifications for Critical events only. • error: Sends notifications for Error and Critical events. • warn: Sends notifications for Warning, Error, and Critical events. • resolved: Sends notifications for Resolved, Warning, Error, and Critical events. • info: Sends notifications for all events. • none: Disables email notification. This parameter does not apply to managed-logs notifications.
email-notification-filter-numeric	uint32	Numeric equivalents for email-notification-filter values. • 0: info • 1: resolved

Table 38. email-parameters properties (continued)

Name	Type	Description
		• 2: warn • 3: error • 4: crit • 5: none
email-notify-address-1	string	Up to three email addresses for recipients of event notifications.
email-notify-address-2	string	
email-notify-address-3	string	
email-notify-address-4	string	Shows the email address for the log-collection system used by the log-management feature.
email-security-protocol	string	• TLS: Transport Layer Security (TLS) authentication is enabled. • SSL: Secure Sockets Layer (SSL) authentication is enabled. • None: No authentication is enabled.
email-security-protocol-numeric	uint32	Numeric equivalents for email-security-protocol values. • 0: None • 1: TLS • 2: SSL
email-smtp-port	string	The port on which the configured SMTP server is listening.
email-server	string	The IP address of the SMTP mail server to use for the email messages.
email-domain	string	The domain name that, with the sender name, forms the “from” address for remote notification.
email-sender	string	The sender name that, with the domain name, forms the “from” address for remote notification.
email-sender-password	string	The sender password.
include-logs	string	Shows whether system log files will automatically be attached for email notification messages generated by the log-management feature. This is the “push” mode of log management.
include-logs-numeric	uint32	Numeric equivalents for include-logs values. • 0: Disabled • 1: Enabled

enclosure-fru

This basetype is used by show configuration and show frus.

Table 39. enclosure-fru properties

Name	Type	Description
name	string	FRU name. • CHASSIS_MIDPLANE: Chassis and midplane circuit board • RAID_IOM: Controller module • BOD_IOM: Expansion module • POWER_SUPPLY: Power supply module • MEMORY CARD: CompactFlash card
description	string	FRU long description.
part-number	string	FRU part number.

Table 39. enclosure-fru properties (continued)

Name	Type	Description
serial-number	string	FRU serial number.
revision	string	FRU hardware revision level.
dash-level	string	FRU template revision number.
fru-shortname	string	FRU short description.
mfg-date	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when a PCBA was programmed or a power supply module was manufactured.
mfg-date-numeric	uint32	Unformatted `mfg-date` value.
mfg-location	string	City, state/province, and country where the FRU was manufactured.
mfg-vendor-id	string	JEDEC ID (global manufacturing code) of the FRU manufacturer.
fru-location	string	Location of the FRU in the enclosure. • `MID-PLANE SLOT`: Chassis midplane. • `UPPER IOM SLOT`: Controller module or expansion module A. • `LOWER IOM SLOT`: Controller module or expansion module B. • `LEFT IOM SLOT`: Controller module or expansion module A, in the left slot as viewed from the back. • `RIGHT IOM SLOT`: Controller module or expansion module B, in the right slot as viewed from the back. • `CONTROLLER A`: Controller module A. • `CONTROLLER B`: Controller module B. • `UPPER IOM MEMORY CARD SLOT`: Memory card slot in controller module A. • `LOWER IOM MEMORY CARD SLOT`: Memory card slot in controller module B. • `LEFT IOM MEMORY CARD SLOT`: Memory card slot in controller module B. • `RIGHT IOM MEMORY CARD SLOT`: Memory card slot in controller module A.
configuration-serialnumber	string	Configuration serial number.
fru-status	string	• `Absent`: The FRU is not present. • `Fault`: The FRU's health is Degraded or Fault. • `Invalid Data`: The FRU ID data is invalid. The FRU's EEPROM is improperly programmed. • `OK`: The FRU is operating normally. • `Power OFF`: The FRU is powered off.
fru-status-numeric	uint32	• `0`: Invalid Data • `1`: Fault • `2`: Absent • `3`: Power OFF • `4`: OK • `5`: N/A
original-serialnumber	string	For a power supply module, the original manufacturer serial number. Otherwise, N/A.
original-partnumber	string	For a power supply module, the original manufacturer part number. Otherwise, N/A.
original-revision	string	For a power supply module, the original manufacturer hardware revision. Otherwise, N/A.
enclosure-id	uint32	Enclosure ID.

enclosure-list

This basetype is used by `show configuration`, and by `show disks` when the `encl` parameter is specified.

Table 40. enclosure-list properties

Name	Type	Description
status	string	Disk slot status. • `Up`: The disk is present and is properly communicating with the expander. • `Spun Down`: The disk is present and has been spun down by the drive spin down feature. • `Warning`: The disk is present but the system is having communication problems with the disk LED processor. For disk and midplane types where this processor also controls power to the disk, power-on failure will result in Error status. • `Error`: The disk is present but is not detected by the expander. • `Unknown`: Initial status when the disk is first detected or powered on. • `Not Present`: The disk slot indicates that no disk is present. • `Unrecoverable`: The disk is present but has unrecoverable errors. • `Unavailable`: The disk is present but cannot communicate with the expander. • `Unsupported`: The disk is present but is an unsupported type.
status-numeric	uint32	Numeric equivalents for `status` values. • `0`: Unsupported • `1`: Up • `2`: Error • `3`: Warning • `4`: Unrecoverable • `5`: Not Present • `6`: Unknown • `7`: Unavailable • `20`: Spun Down
enclosure-id	uint32	Enclosure ID.
slot	uint32	Disk slot number.
vendor	string	Disk vendor.
model	string	Disk model.
serial-number	string	Disk serial number.
size	string	Disk capacity, formatted to use the current base, precision, and units.
size-numeric	uint64	Unformatted `size` value in blocks.

enclosures

This basetype is used by `show configuration` and `show enclosures`.

Table 41. enclosure properties

Name	Type	Description
durable-id	string	Enclosure ID in the format `enclosure_`*`number`*.
enclosure-id	uint8	Enclosure ID.

Table 41. enclosure properties (continued)

Name	Type	Description
enclosure-wwn	string	Enclosure WWN.
name	string	Enclosure name.
type	string	Internal name for the enclosure type.
type-numeric	uint32	Numeric equivalents for `type` values.
iom-type	string	I/O module type.
iom-type-numeric	uint32	Numeric equivalents for `iom-type` values.
platform-type	string	Hardware `platform` type.
platform-type-numeric	uint32	Numeric equivalents for `platform-type` values.
board-model	string	Board model.
board-model-numeric	uint32	Numeric equivalents for `board-model` values.
location	string	Enclosure location, or blank if not set.
rack-number	uint8	Number of the rack that contains the enclosure.
rack-position	uint8	Position of the enclosure in the rack.
number-of-coolings-elements	uint8	Number of fan units in the enclosure.
number-of-disks	uint8	Number of disk slots (not installed disks) in the enclosure.
number-of-power-supplies	uint8	Number of power supplies in the enclosure.
status	string	Enclosure status. • `Unsupported` • `OK` • `Critical` • `Warning` • `Unrecoverable` • `Not Installed` • `Unknown` • `Unavailable`
status-numeric	uint32	Numeric equivalents for `status` values. • `0`: Unsupported • `1`: OK • `2`: Critical • `3`: Warning • `4`: Unrecoverable • `5`: Not Installed • `6`: Unknown • `7`: Unavailable
extended-status	hex32	A numeric value that supplements the standard SES status shown by the `status` and `status-numeric` properties, and represents a specific condition. • `0x01`: IOM A incompatible • `0x02`: IOM B incompatible
midplane-serial-number	string	Midplane serial number.
vendor	string	Enclosure vendor.
model	string	Enclosure model.
fru_tlapn	string	FRU top-level assembly part number.

Table 41. enclosure properties (continued)

Name	Type	Description
fru-shortname	string	FRU short description.
fru-location	string	FRU location. • `MID-PLANE SLOT`: Chassis midplane. • (blank): Not applicable.
part-number	string	FRU part number.
mfg-date	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*(UTC), when a PCBA was programmed or a power supply module was manufactured.
mfg-date-numeric	uint32	Unformatted `mfg-date` value.
mfg-location	string	City, state/province, and country where the FRU was manufactured.
description	string	FRU long description.
revision	string	Hardware revision level for the FRU.
dash-level	string	FRU template revision number.
emp-a-rev	string	Firmware revision of controller A's EMP.
emp-b-rev	string	Firmware revision of controller B's EMP.
rows	uint8	Number of rows of disk slots.
columns	uint8	Number of columns of disk slots.
slots	uint8	Number of disk slots in this enclosure
locator-led	string	Shows the state of the locator LED on an enclosure. • `Off` • `On`
locator-led-numeric	uint32	Numeric equivalents for `locator-led` values. • `0`: Off • `1`: On
drive-orientation	string	• `vertical`: Disks are oriented vertically. • `horizontal`: Disks are oriented horizontally.
drive-orientation-numeric	uint32	Numeric equivalents for `drive-orientation` values. • `0`: vertical • `1`: horizontal
enclosure-arrangement	string	• `vertical`: Disks are numbered vertically (by column from top to bottom, proceeding from left to right). • `horizontal`: Disks are numbered horizontally (by row from left to right, proceeding from top to bottom).
enclosure-arrangement-numeric	uint32	Numeric equivalents for `enclosure-arrangement` values. • `0`: vertical • `1`: horizontal
emp-a-busid	string	SCSI channel ID of controller A EMP.
emp-a-targetid	string	SCSI target ID of controller A EMP.
emp-b-busid	string	SCSI channel ID of controller B EMP.
emp-b-targetid	string	SCSI target ID of controller B EMP.
emp-a	string	Shows the field name EMP A in console format.

Table 41. enclosure properties (continued)

Name	Type	Description
emp-a-ch-id-rev	string	SCSI address and firmware revision of controller A EMP.
emp-b	string	Shows the field name EMP B in console format.
emp-b-ch-id-rev	string	SCSI address and firmware revision of controller B EMP.
midplane-type	string	An abbreviation that describes the enclosure midplane's rack-unit height, maximum number of disks, maximum data rate to disks (Gbit/s), and hardware version.
midplane-type-numeric	uint32	Numeric equivalents for `midplane-type` values.
midplane-rev	uint8	Midplane revision number.
enclosure-power	string	Enclosure power in watts.
pcie2-capable	string	• `False`: Enclosure is not capable of using PCI Express version 2. • `True`: Enclosure is capable of using PCI Express version 2.
pcie2-capable-numeric	uint32	Numeric equivalents for `pcie2-capable` values. • `0`: False • `1`: True
health	string	• `OK` • `Degraded` • `Fault` • `Unknown` • `N/A`
health-numeric	uint32	Numeric equivalents for `health` values. • `0`: OK • `1`: Degraded • `2`: Fault • `3`: Unknown • `4`: N/A
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended actions to take to resolve the health issue.
unhealthy-component	Embedded; see unhealthy-component.	
drawer	Embedded; see drawers.	
controllers	Embedded; see controllers, io-modules.	
power-supplies	Embedded; see power-supplies.	
fan-modules	Embedded; see fan-modules.	
fan-details	Embedded; see fan.	

events

This basetype is used by `show events`.

Table 42. event properties

Name	Type	Description
time-stamp	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when this event was detected.

Table 42. event properties (continued)

Name	Type	Description
time-stamp-numeric	uint32	Unformatted time-stamp value.
event-code	string	Event code.
event-id	string	Event ID.
model	string	Controller model.
serial-number	string	Controller serial number.
controller	string	• `A`: Controller A. • `B`: Controller B.
controller-numeric	uint32	Numeric equivalents for `controller` values. • `0`: B • `1`: A
severity	string	Event severity. • `CRITICAL`: A failure occurred that may cause a controller to shut down. Correct the problem immediately. • `ERROR`: A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible. • `WARNING`: A problem occurred that may affect system stability but not data integrity. Evaluate the problem and correct it if necessary. • `INFORMATIONAL`: A configuration or state change occurred, or a problem occurred that the system corrected. No action is required. • `RESOLVED`: A condition that caused an event to be logged has been resolved.
severity-numeric	uint32	Numeric equivalents for `severity` values. • `0`: INFORMATIONAL • `1`: WARNING • `2`: ERROR • `3`: CRITICAL • `4`: RESOLVED
message	string	Brief description of the event that occurred. For some events, the message includes data about affected components.
additional- information	string	Shows additional information, if available, about the event.
recommended-action	string	Recommends actions to take, if any, to resolve the issue reported by the event.

eventsLogs

This basetype is used by `show events` when the `logs` parameter is specified.

Table 43. eventsLogs properties

Name	Type	Description
event-id	string	Event ID prefaced by A or B to identify the controller that logged the event.
time-stamp	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when this event was detected.
time-stamp-numeric	string	Unformatted `time-stamp` value.
event-code	string	Event code identifying the type of event to help diagnose problems.
severity	string	Event severity. • `CRITICAL`: A failure occurred that may cause a controller to shut down. Correct the problem immediately.

Table 43. eventsLogs properties (continued)

Name	Type	Description
		• `ERROR`: A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible. • `WARNING`: A problem occurred that may affect system stability but not data integrity. Evaluate the problem and correct it if necessary. • `INFORMATIONAL`: A configuration or state change occurred, or a problem occurred that the system corrected. No action is required. • `RESOLVED`: A condition that caused an event to be logged has been resolved.
severity-numeric	uint32	Numeric equivalents for `severity` values. • `0`: INFORMATIONAL • `1`: WARNING • `2`: ERROR • `3`: CRITICAL • `4`: RESOLVED
message	string	Message giving details about the event.

expander-ports

This basetype is used by `show sas-link-health`.

Table 44. expander-ports properties

Name	Type	Description
durable-id	string	Expander port ID.
enclosure-id	uint32	Enclosure ID.
controller	string	• `A`: Controller A. • `B`: Controller B.
controller-numeric	uint32	Numeric equivalents for `controller` values. • `0`: B • `1`: A
sas-port-type	string	• `Drawer Port Egress` • `Drawer Port Ingress` • `Expansion Port Egress` • `Expansion Port Ingress` • `Expansion Port Universal`
sas-port-type-numeric	uint32	Numeric equivalents for `sas-port-type` values. • `1`: Drawer Port Egress • `2`: Drawer Port Ingress • `3`: Expansion Port Egress • `4`: Expansion Port Ingress • `5`: Expansion Port Universal
sas-port-index	uint32	The expander port index. For an IOM with two expansion ports, this value differentiates the two egress ports (0–1) and two ingress ports (0–1) for each path A and B. This value is appended to the port's `durable-id` value.
name	string	• `Out Port`: Egress (expansion) port on controller module or an expansion module. Can be connected to an ingress port in an expansion module. • `In Port`: Ingress port on an expansion module. Can be connected to an egress (expansion) port in a controller module or an expansion module.

Table 44. expander-ports properties (continued)

Name	Type	Description
		• `Universal Port`: Port that can function as either an egress or ingress port in a controller module or an expansion module.
status	string	Expander port status. • `Up`: The port is cabled and has an I/O link. • `Warning`: Not all of the port PHYs are up. • `Error`: The port is reporting an error condition. • `Not Present`: The controller module is not installed or is down. • `Disconnected`: Either no I/O link is detected or the port is not cabled.
status-numeric	uint32	Numeric equivalents for `status` values. • `0`: Up • `1`: Warning • `2`: Error • `3`: Not Present • `4`: Unknown • `6`: Disconnected
health	string	• `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health` values. • `0`: OK • `1`: Degraded • `2`: Fault • `3`: Unknown • `4`: N/A
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended actions to take to resolve the health issue.

expander-versions

This basetype is used by `show versions` when the `frus` parameter is specified.

Table 45. expander-versions properties

Name	Type	Description
name	string	Expansion IOM name in the format IOM *enclosure-ID*, *position*.
location	string	Expander location in the format Enclosure *enclosure-ID*, IOM *I/O-module- ID*.
enclosure-id	uint32	Enclosure ID.
drawer-id	uint8	• `0`: Top • `1`: Bottom
expander-id	uint8	Expander ID.
controller	string	• `A`: Controller A. • `B`: Controller B.
controller-numeric	uint32	Numeric equivalents for `controller` values.

Table 45. expander-versions properties (continued)

Name	Type	Description
		• 0: B • 1: A
fw-revision	string	IOM firmware version, short form.
fw-revision-full	string	IOM firmware version, long form.
vpd-format-version	string	Vital Product Data (VPD) version.
vpd-crc	string	VPD CRC.
cfg-format-version	string	Configuration format version.
cfg-crc	string	CFG CRC.
bootloader-version	string	Boot loader version.
cpld-version	string	Complex Programmable Logic Device (CPLD) firmware version

expanders

This basetype is used by `show enclosures`.

Table 46. expanders properties

Name	Type	Description
durable-id	string	Expander ID.
enclosure-id	uint32	Enclosure ID.
drawer-id (5U84 enclosure)	uint8	• 0: Top • 1: Bottom
drawer-id (2U12/24 enclosure)	uint8	Not applicable (255).
dom-id	uint32	The expander position, shown as an index value that starts at 0 and increments from left to right as viewed from the back of the enclosure.
path-id	string	• A: Controller A. • B: Controller B.
path-id-numeric	uint32	Numeric equivalents for `path-id` values. • 0: B • 1: A
name	string	Expander name.
location	string	Expander location.
status	string	Expander status. • Unsupported • OK • Critical • Warning • Unrecoverable • Not Installed • Unknown • Unavailable
status-numeric	uint32	Numeric equivalents for `status` values.

Table 46. expanders properties (continued)

Name	Type	Description
		• 0: Unsupported • 1: OK • 2: Critical • 3: Warning • 4: Unrecoverable • 5: Not Installed • 6: Unknown • 7: Unavailable
extended-status	hex32	Always 0 for this component.
fw-revision	string	Expander firmware revision.
health	string	• OK • Degraded • Fault • N/A • Unknown
health-numeric	uint32	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: N/A • 4: Unknown
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended action to take to resolve the health issue.
unhealthy-component	Embedded; see unhealthy-component.	
sas-port-details	Embedded; see expander-ports.	

fan

This basetype is used by `show fans` and `show power-supplies`.

Table 47. fan properties

Name	Type	Description
durable-id	string	Fan ID.
name	string	Fan name.
location	string	Fan location.
status-ses	string	Fan status. • Unsupported • OK • Critical • Warning • Unrecoverable • Not Installed • Unknown • Unavailable
status-ses-numeric	uint32	Numeric equivalents for status-ses values.

Table 47. fan properties (continued)

Name	Type	Description
		• 0: Unsupported • 1: OK • 2: Critical • 3: Warning • 4: Unrecoverable • 5: Not Installed • 6: Unknown • 7: Unavailable
extended-status	hex32	A numeric value that provides additional information to supplement the standard SES status shown by the `status` and `status-numeric` properties. The `extended-status` value is a bitwise value computed from the values of five status bits, and may be one of the following values or a combination of these values. • 1: The device has reported a failure. • 2: The device is off. • 4: The device FRU is not installed. • 8: The device status cannot be determined. • 16: The device is requested to be on (not off). This is the default status and represents normal operation. • 17: Device has failed. • 18: Device is off. • 19: Device has failed and is off. • 24: Device status is unknown, which could represent an I2C communication issue.
status	string	Fan unit status. • `Up` • `Error` • `Off` • `Missing`
status-numeric	uint32	Numeric equivalents for `status` values. • 0: Up • 1: Error • 2: Off • 3: Missing
speed	uint32	Fan speed (revolutions per minute).
position	string	Fan position, as viewed from the back of the enclosure. • `Left` • `Right` • `N/A`
position-numeric	uint32	Numeric equivalents for `position` values. • 0: Left • 1: Right • 6: N/A
serial-number	string	• (blank): Not applicable.
part-number	string	• (blank): Not applicable.
fw-revision	string	• (blank): Not applicable. • Firmware revision of a fan FRU.
hw-revision	string	• (blank): Not applicable.

Table 47. fan properties (continued)

Name	Type	Description
locator-led	string	Shows the state of the locator LED on a fan unit. • `Off` • `On`
locator-led-numeric	uint32	Numeric equivalents for `locator-led` values. • `0`: Off • `1`: On
health	string	• `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health` values. • `0`: OK • `1`: Degraded • `2`: Fault • `3`: N/A • `4`: Unknown
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended actions to take to resolve the health issue.

fan-module-versions

This basetype is used by `show versions` when the `frus` parameter is specified.

Table 48. fan-module-versions properties

Name	Type	Description
name	string	Fan name in the format `fan_`*`enclosure-ID.fan-number`*.
location	string	Fan location in the format Enclosure *`enclosure-ID - position`*. The position is as viewed from the back of the enclosure.
enclosure-id	uint32	Enclosure ID.
fan-module-id	uint8	Fan module ID.
fw-revision	string	Fan firmware version.
cfg-crc	string	CFG CRC.

fan-modules

This basetype is used by `show fan-modules`.

Table 49. fan-modules properties

Name	Type	Description
durable-id	string	Fan module ID.
enclosure-id	uint32	Enclosure ID.

Table 49. fan-modules properties (continued)

Name	Type	Description
dom-id	uint32	The fan module position, shown as an index value that starts at 0 and increments from left to right as viewed from the back of the enclosure.
name	string	Fan module name.
location	string	Fan module location.
status	string	Fan module status. • `Unsupported` • `OK` • `Critical` • `Warning` • `Unrecoverable` • `Not Installed` • `Unknown` • `Unavailable`
status-numeric	uint32	Numeric equivalents for `status` values. • `0`: Unsupported • `1`: OK • `2`: Critical • `3`: Warning • `4`: Unrecoverable • `5`: Not Installed • `6`: Unknown • `7`: Unavailable
extended-status	hex32	A numeric value that supplements the standard SES status shown by the `status` and `status-numeric` properties, and represents a specific condition.
position	string	Fan module position, as viewed from the back of the enclosure. • `Indexed`
position-numeric	uint32	Numeric equivalents for `position` values. • `5`: Indexed
health	string	• `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health`values. • `0`: OK • `1`: Degraded • `2`: Fault • `3` • `4`: Unknown
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended action to take to resolve the health issue.
unhealthy-component	Embedded; see unhealthy-component.	
fan-details	Embedded; see fan.	

fc-port

This basetype is used by `show ports` for a Fibre Channel port.

Table 50. fc-port properties

Name	Type	Description
configured-topology	string	Configured topology. • `Loop` : Fibre Channel arbitrated loop (public or private). • `PTP` : Fibre Channel point-to-point. • `Auto` : Loop preferred, otherwise point-to-point, based on the detected connection type.
configured-topology-numeric	uint32	Numeric equivalents for `configured-topology` values. • `0`: Loop • `1` : PTP • `2`: Auto
primary-loop-id	string	If the port is using loop topology and the port status is Up, this field shows the primary loop ID. If the port is not using loop topology or the port status is not `Up`, this field shows `N/A`.
sfp-status	string	SFP status. • `OK` • `Not present` : No SFP is inserted in this port. • `Not compatible` : The SFP in this port is not qualified for use in this system. When this condition is detected, event 464 is logged. • `Incorrect protocol` : The SFP protocol does not match the port protocol. When this condition is detected, event 464 is logged.
sfp-status-numeric	uint32	Numeric equivalents for `sfp-status` values. • `0` : Not compatible • `1` : Incorrect protocol • `2` : Not present • `3` : OK
sfp-present	string	Shows whether the port contains an SFP. • `Not Present` • `Present`
sfp-present-numeric	uint32	Numeric equivalents for `sfp-present` values. • `0`: Not Present • `1`: Present
sfp-vendor	string	The SFP vendor.
sfp-part-number	string	The SFP part number.
sfp-revision	string	The SFP revision.
sfp-supported-speeds	string	The link speeds that the SFP supports.
sfp-supported-speeds-numeric	uint32	Numeric equivalents for `sfp-supported-speeds` values.

fde-state

This basetype is used by `show fde-state`.

Table 51. fde-state properties

Name	Type	Description
fde-security-status	string	Shows whether the system is secured or unsecured: • `Unsecured`: The system has not been secured with a passphrase. • `Secured, Lock Ready`: The system has been secured and lock keys have been cleared. The system will become locked after the next power cycle. • `Secured, Locked`: The system is secured and the disks are locked to data access, preventing their use.
fde-security-status-numeric	uint32	Numeric equivalents for `fde-security-status` values. • `1`: Unsecured • `2`: Secured • `3`: Secured, Lock Ready • `4`: Secured, Locked
lock-key-id	string	Current lock ID.
import-lock-key-id	string	The previous or import lock ID.
fde-config-time	string	If the system is secured, the time at which the current lock ID was set in the format *`year-month-day hour:minutes:seconds`* (UTC).
fde-config-time-numeric	uint32	Unformatted `fde-config-time` value.

fenced-data

This basetype is used by `show fenced-data`.

Table 52. fenced-data properties

Name	Type	Description
volume	string	The volume name for which fenced data is reported.
volume-serial	string	The volume serial number for which fenced data is reported.
volume-lba	string	The LBA in the volume at which fenced data is reported.
virtual-disk	string	The name of the disk group for which fenced data is reported.
virtual-disk-serial	string	The serial number of the disk group for which fenced data is reported.
virtual-disk-lba	string	The LBA in the disk group at which fenced data is reported.

fru-versions

This basetype is used by `show versions` when the `frus` parameter is specified.

Table 53. fru-versions properties

Name	Type	Description
enclosure-id	uint32	The enclosure ID.
midplane-versions	Embedded; see midplane-versions.	
expander-versions	Embedded; see expander-versions.	

Table 53. fru-versions properties (continued)

Name	Type	Description
fan-module- versions	Embedded; see fan-module-versions	
psu-versions	Embedded; see psu-versions.	

host

This basetype is used by `show host-groups`.

Table 54. host properties

Name	Type	Description
durable-id	string	Host ID.
name	string	The name of the host.
serial-number	string	The serial number of the host.
member-count	uint32	The number of initiators in the host.
host-group	uint32	If the host is a member of a host group, the serial number of the host group. Otherwise, `UNGROUPEDHOSTS`.
group-key	string	If the host is a member of a host group, the durable ID of the host group. Otherwise, `HGU`.
initiator	Embedded; see initiator.	

host-group

This basetype is used by `show host-groups`.

Table 55. host-group properties

Name	Type	Description
durable-id	string	Host group ID.
name	string	The name of the host group.
serial-number	string	The serial number of the host group.
member-count	uint32	The number of hosts in the host group.
host	Embedded; see host.	

host-group-view

This basetype is used by `show maps` when the `initiator` parameter is specified.

Table 56. host-group-view properties

Name	Type	Description
durable-id	string	Host group ID.
serial-number	string	The serial number of the host group.
group-name	string	The name of the host group in the format *`host-group`*`.*.*`, where the first * represents all hosts in the group and the second * represents all initiators in those hosts.

Table 56. host-group-view properties (continued)

Name	Type	Description
host-view-mappings	Embedded; see host-view-mappings.	

host-port-statistics

This basetype is used by `show host-port statistics`.

Table 57. host-port-statistics properties

Name	Type	Description
durable-id	string	Host port ID in the format `hostport_`*`controller-ID-and-port-number`*.
bytes-per-second	string	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	uint64	Unformatted `bytes-per-second` value.
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
number-of-reads	uint64	Number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	Number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	uint64	Unformatted `data-written` value.
queue-depth	uint32	The number of pending I/O operations currently being serviced.
avg-rsp-time	uint32	Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.
avg-read-rsp-time	uint32	Average response time, in microseconds, for all read operations, calculated over the interval since these statistics were last requested or reset.
avg-write-rsp-time	uint32	Average response time, in microseconds, for all write operations, calculated over the interval since these statistics were last requested or reset.
reset-time	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	uint32	Unformatted `reset-time` value.
start-sample-time	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when sampling started for the iops and bytes-per-second values.
start-sample-time-numeric	uint32	Unformatted `start-sample-time` value.
stop-sample-time	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when sampling stopped for the `iops` and `bytes-per-second` values.
stop-sample-time-numeric	uint32	Unformatted `stop-sample-time` value.

host-view-mappings

This basetype is used by `show maps` when the `initiator` parameter is specified.

Table 58. host-view-mappings properties

Name	Type	Description
volume-name	string	Volume name.
volume-serial	string	Volume serial number.
lun	string	LUN assigned to the mapping.
access	string	Type of host access to the volume. • `read-write: Read and write` • `read-only: Read only` • `no-access: No access (masked)` • `not-mapped: Not mapped`
access-numeric	uint32	Numeric equivalents of access values. • `0`: not-mapped • `1`: no-access • `2`: read-only • `3`: read-write
ports	string	Controller host ports assigned to the mapping.

initiator

This basetype is used by `show initiators`.

Table 59. initiator properties

Name	Type	Description
durable-id	string	Initiator ID.
nickname	string	The nickname of the initiator, or blank.
discovered	string	• `Yes`: The initiator was discovered and its entry was automatically created. • `No`: The initiator was manually created.
mapped	string	• `Yes`: At least one volume is explicitly mapped to the initiator. • `No`: No volumes are explicitly mapped to the initiator.
profile	string	`Standard` : Default profile.
profile-numeric	uint32	Numeric equivalents of `profile` values. • `0`: Standard
host-bus-type	string	• If the host was discovered and its entry was automatically created, its host interface type: `FC`, `iSCSI`, `SAS`. • If the host entry was manually created: `Undefined`.
host-bus-type- numeric	uint32	Numeric equivalents of `host-bus-type` values. • `0`: UNKNOWN • `6`: FC • `8`: SAS • `9`: iSCSI
id	string	• For an FC initiator, its WWPN. • For a SAS initiator, its WWPN.

Table 59. initiator properties (continued)

Name	Type	Description
		• For an iSCSI initiator, its node name (typically the IQN).
host-id	string	If the initiator is a member of a host, the serial number of the host. Otherwise, `NOHOST`.
host-key	string	If the initiator is a member of a host, the durable ID of the host. Otherwise, `HU`.
host-port-bits-a	uint32	For internal use only.
host-port-bits-b	uint32	For internal use only.

initiator-view

This basetype is used by `show maps` when the `initiator` parameter is specified.

Table 60. initiator-view properties

Name	Type	Description
id	string	• For an FC initiator, its WWPN. • For a SAS initiator, its WWPN. • For an iSCSI initiator, its node name (typically the IQN).
hba-nickname	string	The nickname of the initiator.
host-profile	string	`Standard`: Default profile.
host-profile-numeric	uint32	Numeric equivalents of `host-profile` values. • `0`: Standard
host-view-mappings	Embedded; see host-view-mappings.	

inquiry

This basetype is used by `show inquiry`.

Table 61. inquiry properties

Name	Type	Description
mc-fw	string	Management Controller firmware version.
mc-loader	string	Management Controller loader firmware version.
sc-fw	string	Storage Controller firmware version.
sc-loader	string	Storage Controller loader firmware version.
serial-number	string	Controller serial number.
mac-address	string	Controller network port MAC address.
ip-address	string	Controller network port IP address.
ip6-link-local-address	string	The link-local IPv6 address.
ip6-auto-source-address	string	The automatically configured IPv6 address, when applicable.
ip6-auto-address-source-numeric	uint32	The method used to assign or compute the automatic address: • `0`: DHCPv6 • `1`: IPv6 SLAAC
ip61-address	string	First IPv6 address for the controller management port, if set.

Table 61. inquiry properties (continued)

Name	Type	Description
ip62-address	string	Second IPv6 address for the controller management port, if set.
ip63-address	string	Third IPv6 address for the controller management port, if set.
ip64-address	string	Fourth IPv6 address for the controller management port, if set.
nvram-defaults	string	For internal use only.

io-modules

This basetype is used by `show enclosures` for an expansion module.

Table 62. io-modules properties

Name	Type	Description
durable-id	string	Expansion module ID.
controller-id	string	• `A`: Controller A. • `B`: Controller B.
controller-id-numeric	uint32	Numeric equivalents for `controller-id` values. • `0`: B • `1`: A
name	string	FRU name.
description	string	FRU long description.
part-number	string	FRU part number.
serial-number	string	FRU serial number.
revision	string	FRU hardware revision level.
dash-level	string	FRU template revision number.
fru-shortname	string	FRU short description.
mfg-date	string	Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), when the PCBA of the controller was programmed or a power supply module was manufactured.
mfg-date-numeric	uint32	Unformatted `mfg-date` value.
mfg-location	string	City, state/province, and country where the FRU was manufactured.
mfg-vendor-id	string	JEDEC ID of the FRU manufacturer.
position	string	FRU position, as viewed from the back of the enclosure. • `Left` • `Right` • `Top` • `Bottom`
position-numeric	uint32	Numeric equivalents for `position` values. • `0`: Left • `1`: Right • `2`: Top • `3`: Bottom
rotation	string	Rotation of the controller module in the enclosure. • `0 Degrees`

Table 62. io-modules properties (continued)

Name	Type	Description
		• `90 Degrees` • `180 Degrees` • `270 Degrees`
rotation-numeric	string	Numeric equivalents for `position` values. • `0`: 0 Degrees • `1`: 90 Degrees • `2`: 180 Degrees • `3`: 270 Degrees
configuration-serialnumber	string	Configuration serial number.
phy-isolation	string	Shows whether the automatic disabling of SAS expander PHYs having high error counts is enabled or disabled for this controller. • `Enabled`: PHY fault isolation is enabled. • `Disabled`: PHY fault isolation is disabled.
phy-isolation-numeric	uint32	Numeric equivalents for `phy-isolation` values. • `0`: Enabled • `1`: Disabled
locator-led	string	Shows the state of the locator LED on an expansion module. • `Off` • `On`
locator-led-numeric	uint32	Numeric equivalents for `locator-led` values. • `0`: Off • `1`: On
status	string	• `Operational` • `Down` • `Not installed` • `Unknown`
status-numeric	uint32	Numeric equivalents for `status` values. • `0`: Operational • `1`: Down • `2`: Not installed • `3`: Unknown
health	string	• `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health` values. • `0`: OK • `1`: Degraded • `2`: Fault • `3`: Unknown • `4`: N/A
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended action to take to resolve the health issue.
unhealthy-component	Embedded; see unhealthy-component.	

Table 62. io-modules properties (continued)

Name	Type	Description
enclosure-id	Embedded; see expander-ports.	
expander-details	Embedded; see expanders.	

iom-versions

This basetype is used by `show versions` when the `frus` parameter is specified.

Table 63. iom-versions properties

Name	Type	Description
name	string	Expansion IOM name in the format `IOM` *`enclosure-ID`*, *`position`*.
fw-revision	string	IOM firmware version, short form.
fw-revision-full	string	IOM firmware version, long form.
vpd-format-version	string	Vital Product Data (VPD) version.
vpd-crc	string	VPD CRC.
cfg-format-version	string	Configuration format version.
cfg-crc	string	CFG CRC.
bootloader-version	string	Boot loader version.
cpld-version	string	Complex Programmable Logic Device (CPLD) firmware version.
fru-descriptor	string	FRU descriptor.
part-number	string	IOM part number.
iom-serial-number	string	IOM serial number.

ipv6-network-parameters

This basetype is used by `show ipv6-network-parameters`.

Table 64. ipv6-network-parameters properties

Name	Type	Description
controller	string	• `A`: Controller A. • `B`: Controller B.
controller-numeric	uint32	Numeric equivalents for `controller` values. • `0`: A • `1`: B
firewall	string	• `Enabled` • `Disabled`
firewall-numeric	uint32	Numeric equivalents for `firewall` values. • `0`: Disabled • `1`: Enabled
autoconfig	string	• `Enabled` • `Disabled`
autoconfig-numeric	uint32	Numeric equivalents for `autoconfig` values.

Table 64. ipv6-network-parameters properties (continued)

Name	Type	Description
		• 0: Disabled • 1: Enabled
gateway	string	The gateway IP address.
link-local-address	string	The link-local IPv6 address.
autoconfig-ip	string	The auto-configured IPv6 address for the controller.
ip6-address-1	string	First IPv6 address for the controller management port, if set.
ip6-label-1	string	First IPv6 address name, if set.
ip6-address-2	string	Second IPv6 address for the controller management port, if set.
ip6-label-2	string	Second IPv6 address name, if set.
ip6-address-3	string	Third IPv6 address for the controller management port, if set.
ip6-label-3	string	Third IPv6 address name, if set.
ip6-address-4	string	Fourth IPv6 address for the controller management port, if set.
ip6-label-4	string	Fourth IPv6 address name, if set.

iscsi-parameters

This basetype is shown by `show iscsi-parameters`.

Table 65. iscsi-parameters properties

Name	Type	Description
chap	string	Shows whether Challenge-Handshake Authentication Protocol (CHAP) is enabled. • `Enabled`: CHAP is enabled. • `Disabled`: CHAP is disabled.
chap-numeric	uint32	Numeric equivalents for `chap` values. • 0: Disabled • 1: Enabled
jumbo-frames	string	Shows whether support for jumbo frames is enabled. • `Enabled`: Jumbo-frame support is enabled. • `Disabled`: Jumbo-frame support is disabled.
jumbo-frames-numeric	uint32	Numeric equivalents for `jumbo-frames` values. • 0: Disabled • 1: Enabled
isns	string	Shows whether support for Internet Storage Name Service (iSNS) is enabled. • `Enabled`: iSNS is enabled. • `Disabled`: iSNS is disabled.
isns-numeric	uint32	Numeric equivalents for `isns` values. • 0: Disabled • 1: Enabled
isns-ip	string	Address of the iSNS server. The default address is all zeroes.
isns-alt-ip	string	Address of the alternate iSNS server. The default address is all zeroes.
iscsi-speed	string	iSCSI host port link speed.

Table 65. iscsi-parameters properties (continued)

Name	Type	Description
		• `auto`: The proper speed is auto-negotiated. • `1Gbps`: The speed is forced to 1 Gbit/s, overriding a downshift that can occur during auto-negotiation with 1-Gbit/s HBAs. This setting does not apply to 10-Gbit/s HBAs.
iscsi-speed-numeric	uint32	Numeric equivalents for `iscsi-speed` values. • `0`: auto • `1`: 1Gbps
iscsi-ip-version	uint8	iSCSI IP version. • `4`: iSCSI host port addresses use IPv4 format. • `6`: iSCSI host port addresses use IPv6 format.

iscsi-port

This basetype is used by `show ports` for an iSCSI host port.

Table 66. iscsi-port properties

Name	Type	Description
ip-version	string	iSCSI IP version. • `IPv4`: iSCSI host port addresses use IPv4 format. • `IPv6`: iSCSI host port addresses use IPv6 format.
ip-address	string	Assigned port IP address.
gateway	string	For IPv4, gateway IP address for assigned IP address.
netmask	string	For IPv4, subnet mask for assigned IP address.
default-router	string	For IPv6, default router for the assigned IP address.
link-local-address	string	For IPv6, the link-local address that is automatically generated from the MAC address and assigned to the port.
mac-address	string	Unique Media Access Control (MAC) hardware address, also called the physical address.
sfp-status	string	SFP status. • `OK` • `Not present`: No SFP is inserted in this port. • `Not compatible`: The SFP in this port is not qualified for use in this system. When this condition is detected, event 464 is logged. • `Incorrect protocol`: The SFP protocol does not match the port protocol. When this condition is detected, event 464 is logged.
sfp-status-numeric	uint32	Numeric equivalents for `sfp-status` values. • `0`: Not compatible • `1`: Incorrect protocol • `2`: Not present • `3`: OK
sfp-present	string	Shows whether the port contains an SFP. • `Not Present` • `Present`
sfp-present-numeric	uint32	Numeric equivalents for `sfp-present` values. • `0`: Not Present • `1`: Present

Table 66. iscsi-port properties (continued)

Name	Type	Description
sfp-vendor	string	The SFP vendor.
sfp-part-number	string	The SFP part number.
sfp-revision	string	The SFP revision.
sfp-10G-compliance	string	The 10G compliance code of the SFP, if supported, or `No Support`.
sfp-10G-compliance-numeric	uint32	Numeric equivalents of `sfp-10G-compliance` values.
sfp-ethernet-compliance	string	The Ethernet compliance code of the SFP, if supported, or `No Support`.
sfp-ethernet-compliance-numeric	uint32	Numeric equivalents of `sfp-ethernet-compliance` values.
sfp-cable-technology	string	Shows whether the SFP supports active or passive cable technology.
sfp-cable-technology-numeric	uint32	Numeric equivalents of `sfp-cable-technology` values.
sfp-cable-length	uint8	The link length (in meters) that is supported by the SFP while operating in compliance with applicable standards for the cable type.

license

This basetype is used by `show license`.

Table 67. license properties

Name	Type	Description
license-key	string	• The license key, if a license is installed and valid. • Blank if a license is not installed.
license-serial-number	string	The serial number to use when requesting a license.
platform-max-snapshots	uint32	Maximum number of snapshots that the highest-level license allows.
base-max-snapshots	uint32	Maximum number of snapshots allowed without an installed license.
max-snapshots	uint32	Maximum number of snapshots allowed by the installed license.
in-use-snapshots	uint32	Number of existing licensed snapshots.
max-snapshots-expiry	string	Shows when the snapshot license will expire. • `Never`: License doesn't expire. • *`days`*: Number of days remaining for a temporary license. • `Expired`: Temporary license has expired and cannot be renewed.
max-snapshots-expiry-numeric	uint32	Numeric equivalents for `max-snapshots-expiry` values. • `0`: Never • `255`: Expired • *`days`*: Number of days remaining
virtualization	string	Shows whether the capability to create and manage virtual pools is enabled or disabled. • `Disabled`: The capability is disabled. • `Enabled`: The capability is enabled.
virtualization-numeric	uint32	Numeric equivalents for `virtualization` values. • `0`: Disabled • `1`: Enabled
virtualization-expiry	string	Shows when the virtualization license will expire. • `Never`: License is purchasable and doesn't expire.

Table 67. license properties (continued)

Name	Type	Description
virtualization-expiry-numeric	uint32	Numeric equivalents for `virtualization-expiry` values. • `0`: Never
performance-tier	string	Shows whether the capability to create a Performance tier comprised of SSDs is enabled or disabled. • `Disabled`: The capability is disabled. • `Enabled`: The capability is enabled.
performance-tier-numeric	uint32	Numeric equivalents for `performance-tier` values. • `0`: Disabled • `1`: Enabled
performance-tier-expiry	string	Shows when the performance tier license will expire. • `Never`: License is purchasable and doesn't expire. • *`days`*: Number of days remaining for a temporary license. • `Expired`: Temporary license has expired and cannot be renewed.
performance-tier-expiry-numeric	uint32	Numeric equivalents for `performance-tier-expiry` values. • `0`: Never • `255`: Expired • *`days`*`: Number of days remaining`
volume-copy	string	Shows whether the capability to copy volumes is enabled or disabled. • `Disabled`: The capability is disabled. • `Enabled`: The capability is enabled.
volume-copy-numeric	uint32	Numeric equivalents for `volume-copy` values. • `0`: Disabled • `1`: Enabled
volume-copy-expiry	string	Shows when the volume copy license will expire. • `Never`: Always enabled and doesn't expire.
volume-copy-expiry-numeric	uint32	Numeric equivalents for `volume-copy-expiry` values. • `0`: Never
remote-snapshot-replication	string	Shows whether the capability to replicate volumes to a remote system is enabled or disabled. • `Disabled`: The capability is disabled. • `Enabled`: The capability is enabled.
remote-snapshot-replication-numeric	uint32	Numeric equivalents for `remote-snapshot-replication` values. • `0`: Disabled • `1`: Enabled
remote-snapshot-replication-expiry	string	Shows when the volume replication feature will expire. • `Never`: License is purchasable and doesn't expire. • *`days`*: Number of days remaining for a temporary license. • `Expired`: Temporary license has expired and cannot be renewed.
remote-snapshot-replication-expiry-numeric	uint32	Numeric equivalents for `remote-snapshot-replication` values. • `0`: Never • `255`: Expired • *`days`*: Number of days remaining
vds	string	Shows whether the VDS (Virtual Disk Service) Hardware Provider is enabled. • `Disabled`: VDS is disabled. • `Enabled`: VDS is enabled.
vds-numeric	uint32	Numeric equivalents for `vds` values.

Table 67. license properties (continued)

Name	Type	Description
		• `0`: Disabled • `1`: Enabled
vds-expiry	string	Shows when the VDS (Virtual Disk Service) Hardware Provider will expire. • `Never`: License and doesn't expire. • *`days`*: Number of days remaining for a temporary license. • `Expired`: Temporary license has expired and cannot be renewed.
vds-expiry-numeric	uint32	Numeric equivalents for `vds-expiry` values. • `0`: Never • `255`: Expired • *`days`*: Number of days remaining
vss	string	Shows whether the VSS (Volume Shadow Copy Service) Hardware Provider is enabled. • `Disabled`: VSS is disabled. • `Enabled`: VSS is enabled.
vss-numeric	uint32	Numeric equivalents for `vss` values. • `0`: Disabled • `1`: Enabled
vss-expiry	string	Shows when the VSS (Volume Shadow Copy Service) Hardware Provider will expire. • `Never`: License and doesn't expire. • *`days`*: Number of days remaining for a temporary license. • `Expired`: Temporary license has expired and cannot be renewed.
vss-expiry-numeric	uint32	Numeric equivalents for `vss-expiry` values. • `0`: Never • `255`: Expired • *`days`*: Number of days remaining
dsd	string	Shows whether the Drive Spin Down (DSD) feature is enabled. • `Disabled`: DSD is disabled. • `Enabled`: DSD is enabled.
dsd-numeric	uint32	Numeric equivalents for `dsd` values. • `0`: Disabled • `1`: Enabled
dsd-expiry	string	Shows when the Drive Spin Down (DSD) feature will expire. • `Never`: Always enabled and doesn't expire.
dsd-expiry-numeric	uint32	Numeric equivalents for `dsd-expiry` values. • `0`: Never
sra	string	Shows whether Storage Replication Adapter (SRA) support is enabled. • `Disabled`: SRA is disabled. • `Enabled`: SRA is enabled.
sra-numeric	uint32	Numeric equivalents for `sra` values. • `0`: Disabled • `1`: Enabled
sra-expiry	string	Shows when the SRA feature will expire. • `Never`: License and doesn't expire. • *`days`*: Number of days remaining for a temporary license. • `Expired`: Temporary license has expired and cannot be renewed.

Table 67. license properties (continued)

Name	Type	Description
sra-expiry-numeric	uint32	Numeric equivalents for `sra-expiry` values. • `0`: Never • `255`: Expired • *`days`*: Number of days remaining

local-ports

This basetype is used by `show peer-connections`.

Table 68. local-ports properties

Name	Type	Description
local-host-port	string	The ID of the port in the local system.
port-address	string	The assigned port address.

local-ports-detail

This basetype is used by `show peer-connections` when the `verify-links` parameter is specified.

Table 69. local-ports-detail properties

Name	Type	Description
local-host-port	string	The ID of the port in the local system.
port-address	string	The assigned port address.
remote-links	string	The IDs of linked ports in the remote system.

log-header-table

This basetype is used in the log file downloaded from the system by using the PowerVault Manager or FTP.

Table 70. log-header-table properties

Name	Type	Description
log-contact	string	Name of the contact person, if specified in the PowerVault Manager Save Logs panel.
log-email	string	Email address of the contact person, if specified in the PowerVault Manager Save Logs panel.
log-phone	string	Phone number of the contact person, if specified in the PowerVault Manager Save Logs panel.
log-comments	string	Comments describing the problem and specifying the date and time when the problem occurred, if specified in the PowerVault Manager Save Logs panel.
log-content	uint32	For internal use only.
log-timestamp	string	Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), when log content was saved to the file.
log-timestamp-numeric	uint32	Unformatted `log-timestamp` value.

mgmt-hostnames

This basetype is used by `show dns-management-hostname`.

Table 71. mgmt-hostnames properties

Name	Type	Description
controller	string	• `A`: Controller A. • `B`: Controller B.
controller-numeric	uint32	• `0: B` • `1: A`
mgmt-hostname	string	The controller's management host name.
domain-name	string	The controller's FQDN or '-'.

midplane-versions

This basetype is used by `show versions` when the `frus` parameter is specified.

Table 72. midplane-versions properties

Name	Type	Description
vpd-format-version	string	Vital Product Data (VPD) version.
vpd-crc	string	VPD CRC.
cfg-mismatch- version	string	Configuration mismatch version.
cpld-version	string	Complex Programmable Logic Device (CPLD) firmware version.
fru-descriptor	string	FRU descriptor.
part-number	string	Midplane part number.
midplane-serial- number	string	Midplane serial number.

network-parameters

This basetype is used by `show network-parameters`.

Table 73. network-parameters properties

Name	Type	Description
durable-id	string	Controller network port ID in the format `mgmtport_`*`controller-ID`*
active-version	uint32	The configured network port IP version. • `4`: IPv4 • `6`: IPv6
ip-address	string	Controller network port IP address.
gateway	string	Controller network port gateway IP address
subnet-mask	string	Controller network port IP subnet mask
mac-address	string	Controller network port MAC address.
addressing-mode	string	• `Manual`: Network settings are set manually (statically). • `DHCP`: DHCP is used to set network parameters.

Table 73. network-parameters properties (continued)

Name	Type	Description
addressing-mode-numeric	uint32	Numeric equivalents for `addressing-mode` values. • `1: Manual` • `2: DHCP`
link-speed	string	• `Unknown`: For a system operating in Single Controller mode, this controller module is not present. • `10mbps`: The network port link speed is set to 10 Mb/s. • `100mbps`: The network port link speed is set to 100 Mb/s. • `1000mbps`: The network port link speed is set to 1000 Mb/s.
link-speed-numeric	uint32	Numeric equivalents for `link-speed` values. • `0: 10mbps` • `1: 100mbps` • `2: 1000mbps`
duplex-mode	string	• `Undefined`: For a system operating in Single Controller mode, this controller module is not present. • `Half`: The network port duplex mode is set to half duplex. • `Full`: The network port duplex mode is set to full duplex.
duplex-mode-numeric	uint32	Numeric equivalents for `duplex-mode` values. • `0: full` • `1: half` • `2: Undefined`
health	string	The health of the network connection. • `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health` values. • `0: OK` • `1: Degraded` • `2: Fault` • `3: Unknown` • `4: N/A`
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended actions to take to resolve the health issue.
ping-broadcast	string	• `Enabled`: The system will respond to a broadcast ping. `Disabled`: The system will not respond to a broadcast ping.
ping-broadcast-numeric	uint32	Numeric equivalents for `ping-broadcast` values. • `0: Disabled` • `1: Enabled`

ntp-status

This basetype is used by `show ntp-status`.

Table 74. ntp-status properties

Name	Type	Description
ntp-status	string	Shows whether use of Network Time Protocol (NTP) is enabled. • `activated`: NTP is enabled. • `deactivated`: NTP is disabled.
ntp-server-address	string	• The current NTP server IP address if NTP is enabled. • The last-set NTP server IP address if NTP was enabled and has been disabled. • `0.0.0.0` if the NTP server IP address has not been set.
ntp-contact-time	string	(UTC), of the last message received from the NTP server. • Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), of the last message received from the NTP server. • `none`: No contact.

peer-connection-info

This basetype is used by `query peer-connection`.

Table 75. peer-connection-info properties

Name	Type	Description
system-name	string	The name of the system.
system-contact	string	The name of the person who administers the system.
system-location	string	The location of the system.
system-information	string	A brief description of what the system is used for or how it is configured.
midplane-serial-number	string	The serial number of the controller enclosure midplane.
vendor-name	string	The vendor name.
product-id	string	The product model identifier.
license-key and other license properties	See license.	
peer-controllers	Embedded; see peer-controllers.	

peer-connections

This basetype is used by `show peer-connections`.

Table 76. peer-connections properties

Name	Type	Description
peer-connection-name	string	The name of the peer connection.
serial-number	string	The serial number of the peer connection.
connection-type	string	The type of ports being used for the peer connection: • `FC` • `iSCSI`
connection-type-numeric	uint32	Numeric equivalents for `connection-type` values. • `1: FC` • `2: iSCSI`
connection-status	string	• `Online`: The systems have a valid connection.

Table 76. peer-connections properties (continued)

Name	Type	Description
		• `Offline`: No connection is available to the remote system.
connection-status-numeric	uint32	Numeric equivalents for `connection-status` values.
health	string	• `OK` • `Fault` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health` values. • `0: OK` • `1: Degraded` • `2: Fault` • `3: Unknown` • `4: N/A`
health-reason	string	If Health is not `OK`, this field shows the reason for the health state.
health-recommendation	string	If Health is not `OK`, this field shows recommended actions to take to resolve the health issue.
local-ports	Embedded; see local-ports.	
remote-ports	Embedded; see remote-ports.	

peer-controllers

This basetype is used by `query peer-connection`.

Table 77. peer-controllers properties

Name	Type	Description
controller	string	• `A`: Controller A. • `B`: Controller B.
controller-numeric	uint32	Numeric equivalents for `controller` values. • `0: A` • `1: B`
sc-fw	string	Storage Controller firmware version.
sc-loader	string	Storage Controller loader firmware version.
mc-fw	string	Management Controller firmware version.
mc-loader	string	Management Controller loader firmware version
ec-fw	string	Controller firmware version.
pld-rev	string	Complex Programmable Logic Device (CPLD) firmware version.
hw-rev	string	Controller hardware version.
ip-address	string	Controller network port IP address.
host-name	string	The remote host name.
ip61-address	string	First IPv6 address for the controller management port, if set.
ip62-address	string	Second IPv6 address for the controller management port, if set.
ip63-address	string	Third IPv6 address for the controller management port, if set.

Table 77. peer-controllers properties (continued)

Name	Type	Description
ip64-address	string	Fourth IPv6 address for the controller management port, if set.
local-ports	Embedded; see peer-ports.	

peer-ports

This basetype is used by `query peer-connection`.

Table 78. peer-ports properties

Name	Type	Description
local-host-port	string	The ID of the port in the local system.
connection-type	string	The type of ports being used for the peer connection: • `iSCSI`
connection-type-numeric	uint32	Numeric equivalents for `connection-type` values. • `2: iSCSI`
host-port-health	string	• `OK` • `Degraded` • `Fault` • `N/A`
host-port-health-numeric	uint32	Numeric equivalents for `health` values. • `0: OK` • `1: Degraded` • `2: Fault` • `3: Unknown` • `4: N/A`
port-address	string	The assigned port address.
local-links	string	The IDs of linked ports in the local system.

pool-hist-statistics

This basetype is used by `show pool-statistics` when the `historical` parameter is specified.

Table 79. pool-hist-statistics properties

Name	Type	Description
number-of-ios	uint64	The total number of read and write operations since the last sampling time.
number-of-reads	uint64	The number of read operations since the last sampling time.
number-of-writes	uint64	The number of write operations since the last sampling time.
total-data-transferred	string	The total amount of data read and written since the last sampling time.
total-data-transferred-numeric	uint64	Unformatted `total-data-transferred` value.
data-read	string	The amount of data read since the last sampling time.
data-read-numeric	uint64	The amount of data written since the last sampling time.

Table 79. pool-hist-statistics properties (continued)

Name	Type	Description
data-written	string	The amount of data written since the last sampling time.
data-written-numeric	uint64	The amount of data written since the last sampling time.
total-iops	uint64	The total number of read and write operations per second since the last sampling time.
read-iops	uint64	The number of read operations per second since the last sampling time.
write-iops	uint64	The number of write operations per second since the last sampling time.
total-bytes-per-sec	string	The total data transfer rate, in bytes per second, since the last sampling time.
total-bytes-per-sec-numeric	uint64	Unformatted `total-bytes-per-second` value.
read-bytes-per-sec	string	The data transfer rate, in bytes per second, for read operations since the last sampling time.
read-bytes-per-sec-numeric	uint64	Unformatted `read-bytes-per-second` value.
write-bytes-per-sec	string	The data transfer rate, in bytes per second, for write operations since the last sampling time.
write-bytes-per-sec-numeric	uint64	Unformatted `write-bytes-per-second` value.
number-of-allocated-pages	uint64	The number of 4 MB pages allocated to volumes in the pool.
sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when the data sample was taken.
sample-time-numeric	uint32	Unformatted sample-time value.

pool-statistics

This basetype is used by `show pool-statistics`.

Table 80. pool-statistics properties

Name	Type	Description
sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when the data sample was taken.
sample-time-numeric	uint32	Unformatted `sample-time` value.
serial-number	string	The serial number of the pool.
pool	string	The name of the pool.
pages-alloc-per-minute	uint32	The rate, in pages per minute, at which pages are allocated to volumes in the pool because they need more space to store data.
pages-alloc-per-hour	uint32	The rate, in pages per hour, at which pages are allocated to volumes in the pool because they need more space to store data.
pages-dealloc-per-minute	uint32	The rate, in pages per minute, at which pages are deallocated from volumes in the pool because they no longer need the space to store data.
pages-dealloc-per-hour	uint32	The rate, in pages per hour, at which pages are deallocated from volumes in the pool because they no longer need the space to store data.
num-pages-unmap-per-minute	uint32	The number of 4 MB pages that host systems have unmapped per minute, through use of the SCSI UNMAP command, to free storage space as a result of deleting files or formatting volumes on the host.

Table 80. pool-statistics properties (continued)

Name	Type	Description
num-pages-unmap-per-hour	uint32	The number of 4 MB pages that host systems have unmapped per hour, through use of the SCSI `UNMAP` command, to free storage space as a result of deleting files or formatting volumes on the host.
num-blocked-ssd-promotions-per-minute	uint32	The rate, in pages per minute, at which pages cannot be moved to SSD. A consistent non-zero rate may indicate the SSD tier is too small for the current workload.
num-blocked-ssd-promotions-per-hour	uint32	The rate, in pages per hour, at which pages cannot be moved to SSD. A consistent non-zero rate may indicate the SSD tier is too small for the current workload.
num-page-allocations	uint64	The number of pages allocated to volumes in the pool because they need more space to store data.
num-page-deallocations	uint64	The number of pages deallocated from volumes in the pool because they no longer need the space to store data.
num-page-unmaps	uint64	The number of 4 MB pages that host systems have unmapped since statistics were last reset.
num-page-promotions-to-ssd-blocked	uint64	The number of pages that could not be moved to SSD since statistics were last reset.
num-hot-page-moves	uint64	The number of “hot” pages promoted from lower tiers to higher tiers since statistics were last reset.
num-cold-page-moves	uint64	The number of “cold” pages promoted from lower tiers to higher tiers since statistics were last reset.
resettable-statistics	Embedded; see resettable-statistics.	
tier-statistics	Embedded; see tier-statistics.	

pool-summary

This basetype is used by `show pool-statistics` when the historical parameter is specified.

Table 81. pool-summary properties

Name	Type	Description
serial-number	string	The serial number of the pool.
pool	string	The name of the pool.
pool-hist- statistics	Embedded; see pool-hist-statistics.	

pools

This basetype is used by `show configuration` and `show pools`.

Table 82. pools properties

Name	Type	Description
name	string	The name of the pool.
serial-number	string	The serial number of the pool.
url	string	Pool URL.
storage-type	string	• `Linear`: Linear pool.

Table 82. pools properties (continued)

Name	Type	Description
		• `Virtual`: Virtual pool.
storage-type- numeric	uint32	Numeric equivalents for `storage-type` values. • `0: Linear` • `1: Virtual`
blocksize	uint32	The size of a block, in bytes.
total-size	string	The total capacity of the pool.
total-size-numeric	unit64	Unformatted `total-size` value in blocks.
total-avail	string	The available capacity in the pool.
total-avail-numeric	unit64	Unformatted total-avail value in blocks.
snap-size	string	Not applicable.
snap-size-numeric	unit64	Not applicable.
allocated-pages	uint32	For a virtual pool, the number of 4 MB pages that are currently in use. For a linear pool, 0.
available-pages	uint32	For a virtual pool, the number of 4 MB pages that are still available to be allocated. For a linear pool, 0.
overcommit	string	• `Disabled`: The allocated size of the volumes cannot exceed the physical capacity of the pool. • `Enabled`: The allocated size of the volumes can exceed the physical capacity of the pool. • `N/A`: Not applicable (linear pool).
overcommit-numeric	uint32	Numeric equivalents for `overcommit` values. • `0: Disabled` • `1: Enabled` • `2: N/A`
over-committed	string	• `True`: The pool is overcommitted. • `False`: The pool is not overcommitted.
over-committed-numeric	uint32	Numeric equivalents for `over-committed` values. • `0: Disabled` • `1: Enabled`
disk-groups	uint16	The number of disk groups in the pool.
volumes	uint16	The number of volumes in the pool.
page-size	string	The page size, formatted to use the current base, precision, and units.
page-size-numeric	uint64	Unformatted `page-size` value in blocks.
low-threshold	string	The low threshold for page allocation as a percentage of pool capacity.
middle-threshold	string	The middle threshold for page allocation as a percentage of pool capacity.
high-threshold	string	The high threshold for page allocation as a percentage of pool capacity. The threshold value is automatically calculated based on the available capacity of the pool minus 200 GB of reserved space.
utility-running	string	Job running on the disk, if any. • (blank): None. • `DRSC`: The disk group is being scrubbed. • `EXPD`: The disk group is being expanded. • `INIT`: The disk group is being initialized.

Table 82. pools properties (continued)

Name	Type	Description
		• RBAL: The ADAPT disk group is being rebalanced. • RCON: At least one disk in the disk group is being reconstructed. • VDRAIN: The virtual disk group is being removed and its data is being drained to another disk group. • VPREP: The virtual disk group is being prepared for use in a virtual pool. • VRECV: The virtual disk group is being recovered to restore its membership in the virtual pool. • VREMV: The disk group and its data are being removed. • VREMV: The disk group and its data are being removed. • VRFY: The disk group is being verified. • VRSC: The disk group is being scrubbed.
utility-running-numeric	uint32	Numeric equivalents for job-running values. • 0: None • 2: INIT • 3: RCON • 4: VRFY • 5: EXPD • 6: VRSC • 7: DRSC • 9: VREMV • 12: VPREP • 13: VDRAIN • 14: VRECV • 16: RBAL
preferred-owner	string	Controller that owns the disk group and its volumes during normal operation. • A: Controller A. • B: Controller B.
preferred-owner-numeric	uint32	Numeric equivalents for preferred-owner values. • 0: B • 1: A
owner	string	Current owner, which is either the preferred owner during normal operation or the partner controller when the preferred owner is offline. • A: Controller A. • B: Controller B.
owner-numeric	uint32	Numeric equivalents for owner values. • 0: B • 1: A
rebalance	string	For internal use only.
rebalance-numeric	uint32	For internal use only.
migration	string	For internal use only.
migration-numeric	uint32	For internal use only.
zero-scan	string	For internal use only.
zero-scan-numeric	uint32	For internal use only.
idle-page-check	string	For internal use only.
idle-page-check-numeric	uint32	For internal use only.

Table 82. pools properties (continued)

Name	Type	Description
read-flash-cache	string	For internal use only.
read-flash-cache-numeric	uint32	For internal use only.
metadata-vol-size	string	The size of the pool's metadata volume, formatted to use the current base, precision, and units. This needs to be taken into consideration to account for all pages in the pool that are used.
metadata-vol-size-numeric	uint64	Unformatted `metadata-vol-size` value in blocks.
total-rfc-size	string	The total size in blocks of the read cache in the pool.
total-rfc-size-numeric	uint64	Unformatted `total-rfc-size` value in blocks.
available-rfc-size	string	The unused read-cache space in blocks that is available for use by the pool.
available-rfc- size-numeric	uint64	Unformatted available-rfc-size value in blocks.
reserved-size	string	The total number of pages that are reserved for virtual volumes in the pool.
reserved-size-numeric	unit64	Unformatted `reserved-size` value in blocks.
reserved-unalloc-size	string	The total number of pages that are reserved, but not yet allocated, for virtual volumes in the pool.
reserved-unalloc-size-numeric	unit64	Unformatted `reserved-unalloc-size` value in blocks.
pool-sector-format	string	The sector format of disks in the disk group. • `512n`: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes. • `512e`: All disks use 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries. • `Mixed`: The disk group contains a mix of 512n and 512e disks. This is supported, but for consistent and predictable performance, do not mix disks of different sector size types (512n, 512e).
pool-sector-format-numeric	uint32	Numeric equivalents for `pool-sector-numeric` values. • `0: 512n` • `1: 512e` • `3: Mixed`
health	string	• `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health` values. • `0: OK` • `1: Degraded` • `2: Fault` • `3: Unknown` • `4: N/A`
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended actions to take to resolve the health issue.
disk-groups	Embedded; see disk-groups.	
tiers	Embedded; see tiers.	

Table 82. pools properties (continued)

Name	Type	Description
unhealthy-component	Embedded; see unhealthy-component.	

port

This basetype is used by `show configuration` and `show ports`.

Table 83. port properties

Name	Type	Description
durable-id	string	Controller host port ID in the format `hostport_`*`controller-ID-and-port-number`*.
controller	string	• `A` : Controller A. • `B` : Controller B.
controller-numeric	uint32	Numeric equivalents for controller values. • `0: B` • `1: A`
port	string	Controller ID and port number.
port-type	string	• `FC` : Fibre Channel. • `iSCSI` : Internet SCSI. • `SAS` : Serial Attached SCSI.
port-type-numeric	uint32	Numeric equivalents for `port-type` values. • `0: UNKNOWN` • `6: FC` • `8: SAS` • `9: iSCSI`
media	string	• `FC(P)` : Fibre Channel Point-to-Point. • `FC(L)` : Fibre Channel-Arbitrated Loop (public or private). • `FC(-)` : Not applicable, as when the port is disconnected. • `SAS` : Serial Attached SCSI. • `iSCSI` : Internet SCSI.
target-id	string	• For an FC port, its WWPN. • For a SAS port, its WWPN. • For an iSCSI port, its node name (typically the IQN).
status	string	Port status. • `Up` : The port is cabled and has an I/O link. • `Warning` : Not all of the port's PHYs are up. • `Error` : The port is reporting an error condition. • `Not Present` : The controller module is not installed or is down • `Disconnected` : Either no I/O link is detected or the port is not cabled.
status-numeric	uint32	Numeric equivalents for `status` values. • `0: Up` • `1: Warning` • `2: Error` • `3: Not Present` • `6: Disconnected`
actual-speed	string	Actual link speed in Mbit/s or Gbit/s.

Table 83. port properties (continued)

Name	Type	Description
		• 10Mb • 100Mb • 1Gb • 4Gb • 6Gb • 8Gb • 12Gb • 16Gb • (blank): Port is disconnected.
actual-speed-numeric	uint32	Numeric equivalents for actual-speed values. • 0: 1Gb • 2: 4Gb • 6: 6Gb • 7: 8Gb • 8: 10Mb • 9: 100Mb • 11: 12Gb • 12: 16Gb • 255 : Port is disconnected.
configured-speed	string	Configured host-port link speed in Gbit/s. • Auto • 1Gb • 4Gb • 8Gb • 12Gb • 16Gb
configured-speed-numeric	uint32	Numeric equivalents for configured-speed values. • 0: 1Gb • 2: 4Gb • 3: Auto • 7: 8Gb • 11: 12Gb • 12: 16Gb
health	string	• OK • Degraded • Fault • N/A • Unknown
health-numeric	uint32	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown • 4: N/A
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK , the recommended actions to take to resolve the health issue.
port-details	Embedded; see fc-port, iscsi-port, sas-port	

power-supplies

This basetype is used by `show power-supplies`.

Table 84. power-supplies properties

Name	Type	Description
durable-id	string	Power supply ID in the format `psu_enclosure-ID.power-supply-number`.
enclosure-id	uint32	Enclosure ID.
dom-id	uint32	The power supply position, shown as an index value that starts at 0 and increments from left to right as viewed from the back of the enclosure.
serial-number	string	Power supply serial number.
part-number	string	FRU part number.
description	string	FRU long description.
name	string	Power supply identifier and location.
fw-revision	string	• (blank): Not applicable. • Firmware revision of the power supply.
revision	string	FRU hardware revision level.
model	string	Power supply model.
vendor	string	Power supply vendor.
location	string	Power supply location in the format Enclosure *enclosure-ID - position*, where the position is as viewed from the back of the enclosure.
position	string	Power supply position, as viewed from the back of the enclosure. • `Left` • `Right` • `Top` • `Bottom`
position-numeric	uint32	Numeric equivalents for `position` values. • `0: Left` • `1: Right` • `2: Top` • `3: Bottom`
dash-level	string	FRU template revision number.
fru-shortname	string	FRU short description.
mfg-date	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the power supply module was manufactured.
mfg-date-numeric	uint32	Unformatted `mfg-date` value.
mfg-location	string	City, state/province, and country where the FRU was manufactured.
mfg-vendor-id	string	JEDEC ID of the FRU manufacturer.
configuration-serialnumber	string	Configuration serial number.
dc12v	uint32	Deprecated; power-supply sensor status is shown by the sensors property.
dc5v	uint32	
dc33v	uint32	
dc12i	uint32	
dc5i	uint32	

Table 84. power-supplies properties (continued)

Name	Type	Description
dctemp	uint32	
health	string	• OK • Degraded • Fault • N/A • Unknown
health-numeric	uint32	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown • 4: N/A
health-reason	string	If Health is not OK , the reason for the health state.
health-recommendation	string	If Health is not OK , the recommended actions to take to resolve the health issue.
status	string	Power supply status. • Up • Warning • Error • Not Present • Unknown
status-numeric	uint32	Numeric equivalents for status values. • 0: Up • 1: Warning • 2: Error • 3: Not Present • 4: Unknown
unhealthy-component	Embedded; see unhealthy-component.	
fan-details	Embedded; see fan .	

product-info

This basetype is used by show inquiry.

Table 85. product-info properties

Name	Type	Description
vendor-name	string	Vendor name.
product-id	string	Product model identifier.
scsi-vendor-id	string	Vendor name returned by the SCSI INQUIRY command.

provisioning

This basetype is used by show provisioning.

Table 86. provisioning properties

Name	Type	Description
volume	string	• Volume name. • Blank if the disk group or pool does not have a volume.
volume-serial	string	Volume serial number.
wwn	string	• Volume World Wide Name. • Blank if the disk group or pool does not have a volume.
controller	string	Owning controller of the disk group or pool. • `A` : Controller A. • `B` : Controller B.
controller-numeric	uint32	Numeric equivalents for `controller` values. • `0: B` • `1: A`
disk-display	string	Shorthand list of the disks within a disk group or pool.
disk-display-full	string	List or range of the disks in the disk group or pool specified by the `virtual-disk` property.
virtual-disk	string	Name of the disk group or pool.
virtual-disk- serial	string	Serial number of the disk group or pool.
health	string	Health of the associated disk group or pool. • `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health` values. • `0: OK` • `1: Degraded` • `2: Fault` • `3: Unknown` • `4: N/A`
mapped	string	• `Yes` : The volume is mapped. • `No` : The volume is not mapped.
lun-view	Embedded; see volume-view-mappings	

proxy-information

This basetype is used by `show support-assist`.

Table 87. proxy-information properties

Name	Type	Description
proxy-state	string	• `Disabled` : Use of a proxy host for SupportAssist is disabled. • `Enabled` : Use of a proxy host for SupportAssist is enabled.
proxy-state-numeric	uint32	Numeric equivalents for `proxy-state-numeric` values. • `0: Disabled` • `1: Enabled`
host	string	The proxy host ID.

Table 87. proxy-information properties (continued)

Name	Type	Description
port	string	The proxy host port number.
protocol	string	• `HTTP`
protocol-numeric	uint32	• `0: HTTP`
user-name	string	The proxy user name used to access the proxy server.

psu-versions

This basetype is used by `show versions` when the `frus` parameter is specified.

Table 88. psu-versions properties

Name	Type	Description
name	string	Power supply unit (PSU) name in the format PSU *enclosure-ID*, *position*.
fw-revision	string	PSU firmware version.
dsp-version	string	PSU Digital Signal Processor (DSP) firmware version.
vpd-format-version	string	Vital Product Data (VPD) version.
vpd-crc	string	VPD CRC.
fru-descriptor	string	FRU descriptor.
part-number	string	PSU part number.
psu-serial-number	string	PSU serial number.

readcache-hist-statistics

This basetype is used by `show pool-statistics` when the `historical` parameter is specified.

Table 89. readcache-hist-statistics properties

Name	Type	Description
number-of-ios	uint64	The total number of read and write operations since the last sampling time.
number-of-reads	uint64	The number of read operations since the last sampling time.
number-of-writes	uint64	The number of write operations since the last sampling time.
total-data-transferred	string	The total amount of data read and written since the last sampling time.
total-data-transferred-numeric	uint64	Unformatted `total-data-transferred` value.
data-read	string	The amount of data read since the last sampling time.
data-read-numeric	uint64	The amount of data written since the last sampling time.
data-written	string	The amount of data written since the last sampling time.
data-written-numeric	uint64	The amount of data written since the last sampling time.
total-iops	uint64	The total number of read and write operations per second since the last sampling time.
read-iops	uint64	The number of read operations per second since the last sampling time.
write-iops	uint64	The number of write operations per second since the last sampling time.

Table 89. readcache-hist-statistics properties (continued)

Name	Type	Description
total-bytes-per-sec	string	The total data transfer rate, in bytes per second, since the last sampling time.
total-bytes-per-sec-numeric	uint64	Unformatted `total-bytes-per-second` value.
read-bytes-per-sec	string	The data transfer rate, in bytes per second, for read operations since the last sampling time.
read-bytes-per-sec-numeric	uint64	Unformatted `read-bytes-per-second` value.
write-bytes-per-sec	string	Data transfer rate, in bytes per second, for write operations since the last sampling time.
write-bytes-per-sec-numeric	uint64	Unformatted `write-bytes-per-second` value.
number-of-allocated-pages	uint64	The number of 4 MB pages allocated to volumes in the pool.
number-of-pages-copied	uint64	The number of pages copied to read cache in the sample time period.
number-of-pages-discarded	uint64	The number of pages discarded from read cache (to make room for new hot data) in the sample time period.
sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when the data sample was taken.
sample-time-numeric	uint32	Unformatted `sample-time` value.

redundancy

This basetype is used by `show redundancy-mode`.

Table 90. redundancy properties

Name	Type	Description
redundancy-mode	string	The operating mode of the system, also called the cache redundancy mode. • `Active-Active ULP` : Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance. • `Single Controller`: The enclosure contains a single controller. • `Failed Over` : Operation has failed over to one controller because its partner is not operational. The system has lost redundancy. • `Down` : Both controllers are not operational.
redundancy-mode-numeric	uint32	Numeric equivalents for `redundancy-mode`values. • `2: Active-Active ULP` • `3: Single Controller` • `4: Failed Over` • `5: Down`
redundancy-status	string	• `Redundant` : Both controllers are operational. • `Operational but not redundant` : In active-active mode, one controller is operational and the other is offline. In single-controller mode, the controller is operational. • `Down` : This controller is not operational. • `Unknown`: Status information is not available.
redundancy-status-numeric	uint32	Numeric equivalents for `redundancy-status` values. • `1: Redundant` • `3: Operational but not redundant` • `4: Down` • `5: Unknown`

Table 90. redundancy properties (continued)

Name	Type	Description
controller-a-status	string	• `Operational` : The controller is operational. • `Down` : The controller is installed but not operational. • `Not Installed` : The controller is not installed.
controller-a-status-numeric	uint32	Numeric equivalents for `controller-a-status` values. • `0: Operational` • `1: Down` • `2: Not Installed`
controller-a-serial-number	string	• Controller module serial number • `Not Available` : The controller is down or not installed.
controller-b-status	string	• `Operational` : The controller is operational. • `Down` : The controller is installed but not operational. • `Not Installed` : The controller is not installed.
controller-b-status-numeric	uint32	Numeric equivalents for `controller-b-status` values. • `0: Operational` • `1: Down` • `2: Not Installed`
controller-b-serial-number	string	• Controller module serial number • `Not Available` : The controller is down or not installed.
other-MC-status	string	The operational status of the Management Controller in the partner controller. This is not factored into system health. • `Not Communicating` • `Not Operational` • `Operational` • `Unknown`
other-MC-status-numeric	uint32	Numeric equivalents for `other-mc-status` values. • `1524: Not Communicating` • `3231: Not Operational` • `4749: Operational` • `1496: Unknown`

refresh-counters

This basetype is used by `show refresh-counters`

Table 91. refresh-counters properties

Name	Type	Description
basetype-name	(Not shown)	Shows when the data represented by the base type was last updated. • `0`: The data has never been updated and is not cached. • `nonzero-number` : A timestamp indicating that the data has been updated. If the value has changed since the last time you called this command then the data has changed.

remote-ports

This basetype is used by `show peer-connections`.

Table 92. remote-ports properties

Name	Type	Description
remote-host-port	string	The ID of the port in the remote system.
port-address	string	The assigned port address.

remote-ports-detail

This basetype is used by `show peer-connections` when the `verify-links` parameter is specified.

Table 93. remote-ports-detail parameters

Name	Type	Description
remote-host-port	string	The ID of the port in the remote system.
port-address	string	The assigned port address.
local-links	string	The IDs of linked ports in the local system.

remote-system

This basetype is used by `show remote-systems`.

Table 94. remote-system properties

Name	Type	Description
id	string	Remote system ID.
system-name	string	• The name of the remote system. • `Uninitialized Name` : The default value.
system-contact	string	• The name of the person who administers the remote system. • `Uninitialized Contact` : The default value.
system-location	string	• The location of the remote system. • `Uninitialized Location` : The default value.
system-information	string	• A brief description of the remote system. • `Uninitialized Info` : The default value.
vendor-name	string	The vendor name of the remote system.
product-id	string	The product model identifier of the remote system.
product-brand	string	The brand name of the remote system.
ip-address-a	string	• The IP address of the network port in controller A in the remote system. • `Not Present`
ip-address-b	string	• The IP address of the network port in controller B in the remote system. • `Not Present`
username	string	The name of a user that is configured in the remote system. This must be a user with the manage role to remotely configure or provision that system.
status	string	• `Uninitialized` : This system hasn't communicated with the remote system. • `Ready` : This system has contacted the remote system and it is ready to use. • `Connected` : This system is transferring data to the remote system. • `Not Connected` : The system is not connected to the remote system.
status-numeric	uint32	Numeric equivalents for `status` values.

Table 94. remote-system properties (continued)

Name	Type	Description
		• `0: Uninitialized` • `1: Ready` • `2: Connected`
last-connected	string	Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), when successful communication was last established between the Management Controller in the local system and the Management Controller in the remote system. This value does not indicate when connection status was last determined, and will not be updated if the remote Management Controller is not accessible or if the connection status is Not Connected .
interfaces	string	• `FC` • `iSCSI` • `SAS` • `Hybrid: FC and iSCSI`
interfaces-numeric	uint32	Numeric equivalents for `interfaces` values. • `0: FC` • `1: iSCSI` • `2: SAS` • `3: Hybrid`
storage-model	string	• `LINEAR`
storage-model- numeric	uint32	Numeric equivalents for `storage-model` values. • `0: LINEAR`
isvalid-ip-a	string	• `False` : The IP address is not valid for controller module A in the remote system. • `True` : The IP address is valid for controller module A in the remote system.
isvalid-ip-a- numeric	uint32	Numeric equivalents for `isvalid-ip-a` values. • `0: False` • `1: True`
isvalid-ip-b	string	• `False` : The IP address is not valid for controller B in the remote system. • `True` : The IP address is valid for controller B in the remote system.
isvalid-ip-b- numeric	uint32	Numeric equivalents for `isvalid-ip-b` values. • `0: False` • `1: True`

replication-snapshot-history

This basetype is used by `show replication-snapshot-history`.

Table 95. replication-snapshot-history properties

Name	Type	Description
name	string	The replication set name.
serial-number	string	The replication set serial number.
snapshot-history	string	Specifies whether to maintain a replication snapshot history for the replication set. • `disabled or off` : A snapshot history will not be kept. • `secondary` : A snapshot history set will be kept on the secondary system for the secondary volume.

Table 95. replication-snapshot-history properties (continued)

Name	Type	Description
		• `both` : A snapshot history will be kept for the primary volume on the primary system and for the secondary volume on the secondary system.
snapshot-history- numeric	uint32	Numeric equivalents for snapshot-history values. • 0: disabled • 1: secondary • 2: both
snapshot-count	uint32	The number of snapshots to retain in snapshot history. When a new snapshot exceeds this limit, the oldest snapshot in the snapshot history is deleted.
snapshot-basename	string	The user-defined prefix for the snapshots.
retention-priority	string	The retention priority for snapshots, which is used when automatic deletion of snapshots is enabled by using the set snapshot-space command. In a snapshot tree, only leaf snapshots can be deleted automatically. Deletion based on retention priority is unrelated to deleting the oldest snapshots to maintain a snapshot count. • `never-delete` : Snapshots will never be deleted automatically to make space. The oldest snapshot in the snapshot history will be deleted once the snapshot-count value has been exceeded. • `high` : Snapshots can be deleted after all eligible medium-priority snapshots have been deleted. • `medium` : Snapshots can be deleted after all eligible low-priority snapshots have been deleted. • `low` : Snapshots can be deleted.
retention- priority-numeric	uint32	Numeric equivalents for `retention-priority-numeric` values. • `0: never-delete` • `1: low` • `2: medium` • `3: high`
current- replication-snapshots	Embedded; see current-replication-snapshots.	

reset-snapshot-tasks

This basetype is used by `show tasks` for a `ResetSnapshot` operation.

Table 96. reset-snapshot-tasks properties

Name	Type	Description
snapshot-name	string	Name of the snapshot to reset.
snapshot-serial	string	Serial number of the snapshot to reset.

resettable-statistics

This basetype is used by `show pool-statistics` and `show tier-statistics`.

Table 97. resettable-statistics properties

Name	Type	Description
serial-number	string	The serial number of the pool or tier.

Table 97. resettable-statistics properties (continued)

Name	Type	Description
time-since-reset	uint32	The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.
time-since-sample	uint32	The amount of time, in milliseconds, since this set of statistics was last sampled by the Storage Controller.
number-of-reads	uint64	The number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	The number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	The amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	The amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	uint64	Unformatted `data-written` value.
bytes-per-second	string	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	uint64	Unformatted `bytes-per-second` value.
iops	uint32	The number of input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
avg-rsp-time	uint32	The average response time, in microseconds, for read and write operations since the last sampling time.
avg-read-rsp-time	uint32	The average response time, in microseconds, for read operations since the last sampling time.
avg-write-rsp-time	uint32	The average response time, in microseconds, for write operations since the last sampling time.

sas-host-phy-statistics

This basetype is used by `show host-phy-statistics`.

Table 98. sas-host-phy-statistics properties

Name	Type	Description
port	string	The controller ID and port number.
phy	uint32	The logical location of the PHY within a group, based on the PHY type. Logical IDs are 0-3 for host port PHYs. Each SAS host will have multiple PHYs.
disparity-errors	uint32	The number of doublewords containing running disparity errors that have been received by the PHY, not including those received during Link Reset sequences. A running disparity error occurs when positive and negative values in a signal do not alternate.
lost-dwords	uint32	The number of times the PHY has lost doubleword synchronization and restarted the Link Reset sequence.
invalid-dwords	uint32	The number of invalid doublewords that have been received by the PHY, not including those received during Link Reset sequences.
reset-error-counter	uint32	The number of times the PHY Reset sequence has failed.

sas-port

This basetype is used by `show ports` for a SAS host port.

Table 99. sas-port properties

Name	Type	Description
configured-topology	string	• `Direct`
width	uint8	Number of PHY lanes in the SAS port.
sas-lanes-expected	uint8	Expected number of PHY lanes in the SAS port.
sas-active-lanes	uint8	Number of active lanes in the SAS port. If the port is connected and fewer lanes are active than are expected, the port status will change to `Warning`, the health will change to `Degraded` , and event 354 will be logged.
sas-disabled-lanes	uint8	Number of disabled lanes in the SAS port.

sas-status-controller-a

This basetype is used by `show expander-status` for controller A and controller B.

Table 100. sas-status-controller-a properties

Name	Type	Description
enclosure-id	uint32	Enclosure ID.
drawer-id (5U84 enclosure)	uint8	• `0` : Top • `1` : Bottom
drawer-id (2U12/24 enclosure)	uint8	Not applicable (`255`).
expander-id	uint8	Expander ID.
controller	string	• `A` : Controller A. • `B` : Controller B.
controller-numeric	uint32	Numeric equivalents for `controller` values. • `0: B` • `1: A`
wide-port-index	uint32	The wide-port index.
phy-index	uint32	The PHY index.
wide-port-role	string	The wide-port role. • `Unknown` • `Drive` • `Drawer Egress` • `Drawer Ingress` • `Expansion Egress` • `Expansion Ingress` • `SC Primary` • `SC Alternate` • `Inter Expander` • `Unused`
wide-port-role-numeric	uint32	Numeric equivalents for `wide-port-role` values.

Table 100. sas-status-controller-a properties (continued)

Name	Type	Description
		• `0: Unknown` • `1: Drive` • `2: Drawer Egress` • `3: Drawer Ingress` • `4: Expansion Egress` • `5: Expansion Ingress` • `6: SC Primary` • `7: SC Alternate` • `8: Inter Expander` • `9: Unused`
wide-port-num	uint32	The wide-port number.
type	string	The PHY type. • `Drawer0-Egress` : Drawer 0 egress PHY. • `Drawer0-Ingress` : Drawer 0 ingress PHY. • `Drawer1-Egress` : Drawer 1 egress PHY. • `Drawer1-Ingress` : Drawer 1 drawer ingress PHY. • `Drawer2-Egress` : Drawer 2 egress PHY. • `Drawer2-Ingress` : Drawer 2 ingress PHY. • `Drive` : Drive slot PHY. • `Egress` : Expansion port egress PHY. • `Expander-Egress-0` : Expansion port 0 egress PHY. • `Expander-Egress-1` : Expansion port 1 egress PHY. • `Expander-Ingress-0` : Expansion port 0 ingress PHY. • `Expander-Ingress-1` : Expansion port 1 ingress PHY. • `Ingress` : Expansion port ingress PHY. • `Inter-Exp` : Inter-expander PHY. • `SC` : Storage Controller PHY. • `SC-0` : Storage Controller primary PHY. • `SC-1` : Storage Controller alternate PHY. • `SC-A` : Storage Controller alternate PHY. • `SC-P` : Storage Controller primary PHY. • `SCA- A` : Storage Controller A alternate PHY. • `SCA-P` : Storage Controller A primary PHY. • `SCB-A` : Storage Controller B alternate PHY. • `SCB-P` : Storage Controller B primary PHY.
status	string	PHY status. • `Unavailable` : No status information is available. • `Enabled - Healthy` : The PHY is enabled and healthy • `Enabled - Degraded` : The PHY is enabled but degraded. • `Disabled` : The PHY has been disabled by a user or by the system.
status-numeric	uint32	Numeric equivalents for `status` values. • `0: Unavailable` • `1: Enabled - Healthy` • `2: Enabled - Degraded` • `3: Disabled`
elem-status	string	The SES status that corresponds to the PHY status. • `Disabled` : Critical condition is detected. • `Error` : Unrecoverable condition is detected. Appears only if there is a firmware problem related to PHY definition data.

Table 100. sas-status-controller-a properties (continued)

Name	Type	Description

		• `OK` : Element is installed and no error conditions are known.
		• `Non-critical` : Non-critical condition is detected.
		• `Not Used` : Element is not installed in enclosure.
		• `Unknown` : Either:
		  ○ Sensor has failed or element status is not available. Appears only if an I/O module indicates it has fewer PHYs than the reporting I/O module, in which case all additional PHYs are reported as unknown.
		  ○ Element is installed with no known errors, but the element has not been turned on or set into operation.
		  ○ SES status cannot be determined for another reason.

elem-status-numeric	uint32	Numeric equivalents for `elem-status` values. • `0: Error` • `1: OK` • `2: Disabled` • `3: Non-critical` • `4: Error` • `5: Not Used` • `6: Unknown` • `7: Unknown` • `8: Unknown`
elem-disabled	string	• `Enabled` : PHY is enabled. • `Disabled` : PHY is disabled.
elem-disabled-numeric	uint32	Numeric equivalents for `elem-disabled` values. • `0: Enabled` • `1: Disabled`
elem-reason	string	More information about the status value. • Blank if elem-status is `OK`. • `Error count interrupts` : PHY disabled because of error-count interrupts. • `PHY control` : PHY disabled by a SES control page as a result of action by a Storage Controller or user. • `Not ready` : PHY is enabled but not ready. Appears for SC-1 PHYs when the partner I/O module is not installed. Appears for Drive, SC-1, or Ingress PHYs when a connection problem exists such as a broken connector. • `Disk removed` : PHY disabled because drive slot is empty. • `Unused - disabled by default` : PHY is disabled by default because it is not used. • `Excessive PHY changes` : PHY is disabled because of excessive PHY change counts. • `Did not initialize` : PHY is enabled but not ready because it did not pass COMINIT.
elem-reason-numeric	uint32	Numeric equivalents for `elem-reason` values. • `0 : (blank)` • `3: Error count interrupts` • `5: PHY control` • `6: Not ready` • `8: Disk removed` • `9: Unused - disabled by default` • `10: Excessive PHY changes` • `11: Did not initialize`

Table 100. sas-status-controller-a properties (continued)

Name	Type	Description
change-counter	hex32	Number of times the PHY originated a `BROADCAST (CHANGE)`. A `BROADCAST (CHANGE)` is sent if doubleword synchronization is lost or at the end of a Link Reset sequence.
code-violations	hex32	Number of times the PHY received an unrecognized or unexpected signal.
disparity-errors	hex32	Number of doublewords containing running disparity errors that have been received by the PHY, not including those received during Link Reset sequences. A running disparity error occurs when positive and negative values in a signal do not alternate.
crc-errors	hex32	In a sequence of SAS transfers (frames), the data is protected by a cyclic redundancy check (CRC) value. The `crc-errors` value specifies the number of times the computed CRC does not match the CRC stored in the frame, which indicates that the frame might have been corrupted in transit.
conn-crc-errors	hex32	Number of times the lane between two expanders experienced a communication error.
lost-dwords	hex32	Number of times the PHY has lost doubleword synchronization and restarted the Link Reset sequence.
invalid-dwords	hex32	Number of invalid doublewords that have been received by the PHY, not including those received during Link Reset sequences.
reset-error-counter	hex32	Number of times the expander performed a reset of error counters.
flag-bits	hex32	PHY status flag bits, for internal use.

sas-status-drawer

This basetype is used by `show expander-status` and has the same properties as `sas-status-controller-a`.

schedules

This basetype is used by `show schedules`.

Table 101. schedules properties

Name	Type	Description
name	string	Schedule name.
schedule-specification	string	Schedule settings for running the associated task.
status	string	Schedule status. • `Uninitialized` : The schedule is not yet ready to run. • `Ready` : The schedule is ready to run at the next scheduled time. • `Suspended` : The schedule had an error and is holding in its current state. • `Expired` : The schedule has exceeded a constraint and will not run again. • `Invalid` : The schedule is invalid. • `Deleted` : The task has been deleted.
next-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the schedule will next run, or N/A if the schedule has expired.
next-time-numeric	uint32	Unformatted `next-time` value.
task-to-run	string	Name of the task that the schedule runs.
error-message	string	• If an error occurred while running the schedule, the error message.

Table 101. schedules properties (continued)

Name	Type	Description
		• Blank if no error occurred.
task	Embedded; see tasks.	

security-communications-protocols

This basetype is used by `show protocols`.

Table 102. security-communications-protocols properties

Name	Type	Description
wbi-http	string	• `Disabled` : The standard PowerVault Manager web server interface is disabled. • `Enabled` : The standard PowerVault Manager web server interface is enabled.
wbi-http-numeric	uint32	Numeric equivalents for `wbi-http` values. • `0: Disabled` • `1: Enabled`
wbi-https	string	• `Disabled` : The secure PowerVault Manager web server interface is disabled. • `Enabled` : The secure PowerVault Manager web server interface is enabled.
wbi-https-numeric	uint32	Numeric equivalents for `wbi-https` values. • `0: Disabled` • `1: Enabled`
cli-telnet	string	• `Disabled` : The standard CLI is disabled. • `Enabled` : The standard CLI is enabled.
cli-telnet-numeric	uint32	Numeric equivalents for `cli-telnet` values. • `0: Disabled` • `1: Enabled`
cli-ssh	string	• `Disabled` : The secure shell CLI is disabled. • `Enabled` : The secure shell CLI is enabled.
cli-ssh-numeric	uint32	Numeric equivalents for `cli-ssh` values. • `0: Disabled` • `1: Enabled`
smis	string	• `Disabled` : The secure SMI-S interface is disabled. • `Enabled` : The secure SMI-S interface is enabled. This option allows SMI-S clients to communicate with each controller's embedded SMI-S provider via HTTP port 5989.
smis-numeric	uint32	Numeric equivalents for `smis` values. • `0: Disabled` • `1: Enabled`
usmis	string	• `Disabled` : The unsecure SMI-S interface is disabled. • `Enabled` : The unsecure SMI-S interface is enabled. This option allows SMI-S clients to communicate with each controller's embedded SMI-S provider via HTTP port 5988.
usmis-numeric	uint32	Numeric equivalents for `smis` values. •

Table 102. security-communications-protocols properties (continued)

Name	Type	Description
		• `0: Disabled` • `1: Enabled`
slp	string	• `Disabled` : The SLP interface is disabled. • `Enabled` : The SLP interface is enabled.
slp-numeric	uint32	Numeric equivalents for `slp` values. • `0: Disabled` • `1: Enabled`
ftp	string	• `Disabled` : The FTP interface is disabled. • `Enabled` : The FTP interface is enabled.
ftp-numeric	uint32	Numeric equivalents for `ftp` values. • `0: Disabled` • `1: Enabled`
sftp	string	• `Disabled` : The SFTP interface is disabled. • `Enabled` : The SFTP interface is enabled.
sftp-numeric	uint32	Numeric equivalents for `sftp` values. • `0: Disabled` • `1: Enabled`
snmp	string	• `Disabled` : The SNMP interface is disabled. All SNMP requests to the MIB are disabled and SNMP traps are disabled. • `Enabled` : The SNMP interface is enabled.
snmp-numeric	uint32	Numeric equivalents for `snmp` values. • `0: Disabled` • `1: Enabled`
debug-interface	string	• `Disabled` : The Telnet debug port is disabled. • `Enabled` : The Telnet debug port is enabled.
debug-interface-numeric	uint32	Numeric equivalents for `debug-interface` values. • `0: Disabled` • `1: Enabled`
inband-ses	string	• `Disabled` : The in-band SES interface is disabled. • `Enabled` : The in-band SES interface is enabled.
inband-ses-numeric	uint32	Numeric equivalents for `inband-ses` values. • `0: Disabled` • `1: Enabled`
activity-progress	string	• `Enabled` : Access to the activity progress interface via HTTP port 8081 is enabled. This mechanism reports whether a firmware update or partner firmware update operation is active and shows the progress through each step of the operation. In addition, when the update operation completes, status is presented indicating either the successful completion, or an error indication if the operation failed. • `Disabled` : Access to the activity progress interface via HTTP port 8081 is disabled.
management-mode	string	The default management mode. • `Linear` : Uses linear-storage terminology in command output and system messages. For example, *`vdisk`* for disk groups and pools.

Table 102. security-communications-protocols properties (continued)

Name	Type	Description
		• `Virtual` : Uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, *`disk group`* for disk groups and *`pool`* for pools.
management-mode-numeric	uint32	Numeric equivalents for `management-mode` values. • `2: Linear` • `3: Virtual`
activity-progress-numeric	uint32	Numeric equivalents for `activity-progress` values. • `0: Disabled` • `1: Enabled`

sensors

This basetype is used by `show sensor-status`.

Table 103. sensors properties

Name	Type	Description
durable-id	string	Sensor ID.
enclosure-id	uint32	Enclosure ID.
drawer-id (5U84 enclosure)	uint8	• `0` : Top • `1` : Bottom
drawer-id (2U12/24 enclosure)	uint8	Not applicable (`255`).
controller-id	string	• `A` : Controller A. • `B` : Controller B. • `both` : Both controllers. • `N/A`
controller-id-numeric	uint32	Numeric equivalents for `controller-id` values. • `0: B` • `1: A` • `2: both` • `N/A`
sensor-name	string	Sensor name and location.
value	string	• For a sensor, its value. • For overall unit status, one of the status values below.
status	string	• `OK` : The sensor is present and detects no error condition. • `Warning` : The sensor detected a non-critical error condition. Temperature, voltage, or current is between the warning and critical thresholds. • `Critical` : The sensor detected a critical error condition. Temperature, voltage, or current exceeds the critical threshold. • `Unavailable` : The sensor is present with no known errors, but has not been turned on or set into operation because it is initializing. This typically occurs during controller startup. • `Unrecoverable` : The enclosure management processor (EMP) cannot communicate with the sensor. • `Unknown` : The sensor is present but status is not available.

Table 103. sensors properties (continued)

Name	Type	Description
		• `Not Installed` : The sensor is not present. • `Unsupported` : Status detection is not implemented.
status-numeric	uint32	Numeric equivalents for `status` values. • `0: Unsupported` • `1: OK` • `2: Critical` • `3: Warning` • `4: Unrecoverable` • `5: Not Installed` • `6: Unknown` • `7: Unavailable`
sensor-location	uint32	Superseded by the `container` property.
container	string	Hardware component that contains the sensor. • `controllers` • `enclosures` • `fan` • `iom` • `midplane` • `power-supplies`
container-numeric	uint32	Numeric equivalents for `container` values. • `17: enclosures` • `18: midplane` • `19: controllers` • `20: iom` • `21: power-supplies` • `22: fan`
sensor-type	string	• `Temperature` • `Voltage` • `Current` • `Charge Capacity` • `Unknown Type`
sensor-type-numeric	uint32	Numeric equivalents for `sensor-type` values. • `0: Temperature` • `1: Current` • `2: Voltage` • `3: Charge capacity` • `4: Unknown Type`

service-tag-info

This basetype is used by `show service-tag-info`.

Table 104. service-tag-info properties

Name	Type	Description
service-tag	string	An alphanumeric string that uniquely identifies the product.

sessions

This basetype is used by `show sessions`.

Table 105. sessions properties

Name	Type	Description
username	string	The name of the user for which session information is shown.
interface	string	Shows whether the session is using the CLI or the PowerVault Manager.
management-mode	string	The management mode used in the session. • `Linear` : Uses linear-storage terminology in command output and system messages. For example, *`vdisk`* for disk groups and pools. • `Virtual` : Enables access to virtual replication commands and uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, *`disk group`* for disk groups and **`pool`** for pools.
management-mode-numeric	uint32	Numeric equivalents for `management-mode` values. • `2: Linear` • `3: Virtual`
locale	string	The display language.
locale-numeric	uint32	Numeric equivalents for locale values. • `0: English` • `3: Spanish` • `4: French` • `8: Korean` • `5: German` • `7: Japanese` • `11: Chinese-simplified`
host	string	For a CLI session, the IP address and port number of the connected system.
state	uint32	• `Active` • `Expired`
timeout	uint32	The time in seconds that the session can be idle before it automatically ends.
timeout-counter	uint32	The time in seconds remaining before the session automatically ends.
idle-time	uint32	The time in seconds that the session has been idle.
first-access	string	The date and time when the session started.
first-access-numeric	uint32	Unformatted `first-access-numeric` value.
last-access	string	The date and time when the session was last accessed. It updates to the current time when a command is issued.
last-access-numeric	uint32	Unformatted `last-access-numeric` value.

show-other-MC-status

This basetype is used by `show shutdown-status`.

Table 106. show-other-MC-status properties

Name	Type	Description
other-MC	string	Other MC Status

Table 106. show-other-MC-status properties (continued)

Name	Type	Description
other-MC-status	string	The operational status of the Management Controller in the partner controller. This is not factored into system health. • `Not Communicating` • `Not Operational` • `Operational` • `Unknown`
other-MC-status-numeric	uint32	Numeric equivalents for `other-mc-status` values. • `1524: Not Communicating` • `3231: Not Operational` • `4749: Operational` • `1496: Unknown`

shutdown-status

This basetype is used by `show shutdown-status`.

Table 107. shutdown-status properties

Name	Type	Description
controller	string	• `A` : Controller A. • `B` : Controller B.
status	string	• `up` : The controller is operational. • `down` : The controller is shut down. • `not installed` : The controller is not installed.
status-numeric	uint32	Numeric equivalents for `status` values. • `0: up` • `1: down` • `2: not installed`

sideplanes

This basetype is used by `show enclosures`.

Table 108. sideplanes properties

Name	Type	Description
durable-id	string	Sideplane ID.
enclosure-id	uint32	Enclosure ID.
drawer-id (5U84 enclosure)	uint8	• `0` : Top • `1` : Bottom
drawer-id (2U12/24 enclosure)	uint8	Not applicable (`255`).
dom-id	uint32	The sideplane position, shown as an index value that starts at 0 and increments from left to right as viewed from the back of the enclosure.
path-id	string	• `A` : Controller A. • `B` : Controller B.

Table 108. sideplanes properties (continued)

Name	Type	Description
path-id-numeric	uint32	Numeric equivalents for `path-id` values. • `0: B` • `1: A`
name	string	Sideplane name.
location	string	Sideplane location.
position	string	Sideplane position, as viewed from the front of the enclosure. • `Left` • `Right`
position-numeric	uint32	Numeric equivalents for `position` values. • `0: Left` • `1: Right`
status	string	Sideplane status. • `Unsupported` • `OK` • `Critical` • `Warning` • `Unrecoverable` • `Not Installed` • `Unknown` • `Unavailable`
status-numeric	uint32	Numeric equivalents for `status` values. • `0: Unsupported` • `1: OK` • `2: Critical` • `3: Warning` • `4: Unrecoverable` • `5: Not Installed` • `6: Unknown` • `7: Unavailable`
extended-status	hex32	A numeric value that supplements the standard SES status shown by the `status` and `status-numeric` properties, and represents a specific condition. • `0x01: Not powered` • `0x02: Cable fault` • `0x03: Other fault`
health	string	• `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health` values. • `0: OK` • `1: Degraded` • `2: Fault` • `3: Unknown` • `4: N/A`
health-reason	string	If Health is not `OK`, the reason for the health state.

Table 108. sideplanes properties (continued)

Name	Type	Description
health-recommendation	string	If Health is not `OK`, the recommended action to take to resolve the health issue.
unhealthy-component	Embedded; see unhealthy-component.	
expander-details	Embedded; see expanders.	

snap-space

This basetype is used by `show snapshot-space`.

Table 109. snap-space properties

Name	Type	Description
pool	string	The pool for which information is displayed (A or B).
serial-number	string	The serial number of the pool.
snap-limit-threshold	string	The percentage of the pool that can be used for snapshots (the snapshot space).
snap-limit-size	string	The actual size of the snapshot space.
snap-limit-size-numeric	uint64	Numeric equivalents for `nap-limit-size` values.
allocated-percent-pool	string	The percentage of the pool currently used by snapshots.
allocated-percent-snapspace	string	The percentage of the snapshot space currently used by snapshots.
allocated-size	string	The actual amount of space currently used by snapshots.
allocated-size-numeric	uint64	Numeric equivalents for `allocated-size` values.
snap-low-threshold	string	A percentage of the snapshot space designated as the low threshold.
snap-middle-threshold	string	A percentage of the snapshot space designated as the middle threshold.
snap-high-threshold	string	A percentage of the snapshot space designated as the high threshold.
limit-policy	string	The limit policy for when the percentage of the pool designated for snapshots is reached. • `notify-only` : When the snapshot space is reached an event is generated and logged. • `delete` : When the snapshot space is reached an event is generated and logged and automatic deletion of snapshots occurs.
limit-policy-numeric	uint32	Numeric equivalents for `limit-policy` values. • `0: notify-only` • `1: delete`

snapshots

This basetype is used by `show snapshots`.

Table 110. snapshots properties

Name	Type	Description
durable-id	string	Snapshot ID.
virtual-disk-name	string	The name of the disk group or pool that contains the snapshot.
storage-pool-name	string	The name of the disk group or pool that contains the snapshot.

Table 110. snapshots properties (continued)

Name	Type	Description
storage-pools-url	string	Pool URL.
serial-number	string	Snapshot serial number.
name	string	Snapshot name.
url	string	Snapshot URL.
creation-date-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the snapshot was prepared or committed.
creation-date-time-numeric	uint32	Unformatted `creation-date-time` value.
status	string	Snapshot status. • `Available` • `Unavailable`: See the status-reason value.
status-numeric	uint32	• `0: Available` • `Nonzero: Unavailable`
status-reason	string	Shows N/A for Available status, or one of the following reasons for `Unavailable` status: • `snapshot not found` • `master volume not found` • `snapshot pending (not yet committed)` • `master volume not accessible` • `Volume copy with modified data is in progress` • `Unknown reason`
status-reason-numeric	uint32	Numeric equivalents for `status-reason` values. • `1: snapshot pending (not yet committed)` • `4: master volume not accessible` • `7: Volume copy with modified data is in progress` • `8: snapshot not found` • `10: master volume not found` • `254: N/A` • *`hex-code`* `: Unknown reason`
master-volume-name	string	Name of the volume of which the snapshot was taken.
volume-parent	string	The name of the volume of which the snapshot was taken.
base-volume	string	The root of the snapshot tree, if any. A snapshot tree is a series of inter-related snapshots of a volume and can be 254 levels deep.
base-serial-number	string	The serial number of the base volume.
num-children	uint32	The number of child snapshots (snapshots taken of this snapshot).
num-snaps-tree	uint32	The number of snapshots taken of the base volume and its children. This count includes the base volume and all snapshots that share the base volume as their root.
snap-pool-name	string	• The name of the snap pool for linear snapshots. • Blank for virtual snapshots.
snap-data	string	The total amount of write data associated with the snapshot.
snap-data-numeric	uint64	Unformatted `snap-data` value in blocks.
uniquedata	string	The amount of write data that is unique to the snapshot.
uniquedata-numeric	uint64	Unformatted `uniquedata` value in blocks.

Table 110. snapshots properties (continued)

Name	Type	Description
shareddata	string	The amount of write data that is shared between this snapshot and other snapshots.
shareddata-numeric	uint64	Unformatted `shareddata` value in blocks.
retention-priority	string	The retention priority for the snapshot. • `never-delete`: Snapshots will never be deleted. • `high`: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted. • `medium`: Snapshots may be deleted after all eligible low-priority snapshots have been deleted. • `low`: Snapshots may be deleted. Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion.
retention-priority-numeric	uint64	Numeric equivalents for `retention-priority` values. • `0: never-delete` • `1: high` • `2: medium` • `3: low`
priority-value	string	Retention priority for the snapshot, based on the snapshot attributes and the user-defined retention priority for the snapshot type. • `0x6000`: Standard snapshot. • `0xa000`: Volume-copy snapshot. Snapshot that is being used to copy data from a source volume to a destination volume.
user_priority-value	string	User-defined retention priority for the snapshot type.
snapshot-type	string	Snapshot type. • Standard snapshot : Snapshot of a source volume that consumes a snapshot license.
snapshot-type-numeric	uint64	Numeric equivalents for `snapshot-type` values. • `0x00004000: Standard snapshot` • `0x00000000: N/A`
storage-type	string	• `Linear` : Linear pool. • `Virtual` : Virtual pool.
storage-type-numeric	uint64	Numeric equivalents for `storage-type` values. • `0: Linear` • `1: Virtual`
total-size	string	The total size of the snapshot.
total-size-numeric	uint64	Unformatted `total-size` value in blocks.

snapshot-with-retention-tasks

This basetype is used by `show tasks` for a TakeSnapshot task.

Table 111. snapshot-with-retention-tasks properties

Name	Type	Description
master-volume-name	string	Source volume name.
master-volume- serial	string	Source volume serial number.

Table 111. snapshot-with-retention-tasks properties (continued)

Name	Type	Description
snapshot-prefix	string	A label to identify snapshots created by this task.
retention-count	uint32	Number of snapshots to retain with this prefix. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted.
last-created	string	• The name of the last snapshot created by the task. • Blank if the task has not created a snapshot.
snapshot	Embedded; see snap-tasks.	

snap-tasks

This basetype is used by `show schedules`, and `show tasks` for a task that has created at least one snapshot.

Table 112. snap-tasks properties

Name	Type	Description
snapshot-name	string	Snapshot name.
snapshot-serial	string	Snapshot serial number.

snmp-parameters

This basetype is used by `show snmp-parameters`.

Table 113. snmp-parameters properties

Name	Type	Description
snmp-enabled	string	Shows whether the Simple Network Management Protocol (SNMP) interface is enabled or disabled. • `Disabled`—SNMP is disabled. • `Enabled`—SNMP is enabled.
snmp-enabled- numeric	uint32	Numeric equivalents for `snmp-enabled` values. • `0: Disabled` • `1: Enabled`
snmp-filter	string	Minimum level of events to include for SNMP traps • `crit`—Sends notifications for Critical events only. • `error`—Sends notifications for Error and Critical events. • `warn`—Sends notifications for Warning, Error, and Critical events. • `resolved`—Sends notifications for Resolved, Warning, Error, and Critical events. • `info`—Sends notifications for all events. • `none`—No events are sent as traps and traps are disabled.
snmp-filter- numeric	uint32	Numeric equivalents for `snmp-filter` values. • `0: info` • `1: resolved` • `2: warn` • `3: error` • `4: crit` • `5: none`
snmp-trap-host-1	string	Trap host IP address.

Table 113. snmp-parameters properties (continued)

Name	Type	Description
snmp-trap-host-2	string	Trap host IP address.
snmp-trap-host-3	string	Trap host IP address.
snmp-read- community	string	The community string for read-only access. The value is obscured for users having only the `monitor` role and is shown in clear text for users having the `manage` role.
snmp-write- community	string	The community string for write access. The value is obscured for users having only the `monitor` role and is shown in clear text for users having the `manage`role.

spares-preview

This basetype is used by add storage when the `preview` parameter is specified.

Table 114. spares-preview properties

Name	Type	Description
location	string	Disk enclosure ID and slot number.
type	string	Disk description. • `SAS`: Enterprise SAS spinning disk. • `SAS MDL`: Midline SAS spinning disk. • `SSD SAS`: SAS solid-state disk.
type-numeric	uint32	Numeric equivalents for description values. • `4`: SAS • `8`: SSD SAS • `11`: SAS MDL
tier	string	• `Archive`: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • `Performance`: The disk group is in the highest storage tier, which uses SSDs (high speed). • `Read Cache`: The disk is an SSD providing high-speed read cache for a storage pool. • `Standard`: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity)
tier-numeric	uint32	Numeric equivalents for storage-tier values. • `0`: N/A • `1`: Permance • `2`: Standard • `4`: Archive • `8`: Read Cache
size	string	Disk group capacity, formatted to use the current base, precision, and units.
size-numeric	uint64	Unformatted size value in blocks.
rpm	uint32	The speed of a spinning disk, in thousands of revolutions per minute, as specified by the disk vendor. For an SSD, 0 is shown.
sector-format	string	The disk sector format. • `512n`: The disk uses 512-byte native sector size. Each logical block and physical block is 512 bytes.

Table 114. spares-preview properties (continued)

Name	Type	Description
		• `512e`: The disk uses 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.
sector-format-numeric	uint32	Numeric equivalents for `sector-format` values. • `0`: 512n • `1`: 512e
fde-state	string	The FDE state of the disk • `Unknown`: The FDE state is unknown. • `Not FDE Capable`: The disk is not FDE-capable • `Not Secured`: The disk is not secured. • `Secured, Unlocked`: The system is secured and the disk is unlocked. • `Secured, Locked`: The system is secured and the disk is locked to data access, preventing its use. • `FDE Protocol Failure`: A temporary state that can occur while the system is securing the disk.
fde-state-numeric	uint32	Numeric equivalents for `fde-state` values. • `0`: Not FDE Capable • `1`: Not Secured • `2`: Secured, Unlocked • `3`: Secure, Locked • `4`: FDE Protocol Failure • `5`: Unknown

status

This basetype is used by all commands except `exit`, `help`, and `meta`.

NOTE: The `exit` command does not provide a response; the `help` command always prints text; and the `meta` command does not use the status object.

Table 115. status properties

Name	Type	Description
response-type	string	• `Success`: The command succeeded. • `Error`: The command failed. • `Info`: The command returned an informational message. • `Warning`: The command returned a warning message.
response-type-numeric	uint32	• `0: Success` • `1: Error` • `2: Info` • `3: Warning`
response	string	A message stating what the command accomplished, why the command failed, or information about the command's progress.
return-code	sint32	• `0`: The command completed. • *nnnnn*: The command failed.
component-id	string	Not used.
time-stamp	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the command was issued.

Table 115. status properties (continued)

Name	Type	Description
time-stamp-numeric	uint32	Unformatted `time-stamp` value.

storage-preview

This basetype is used by add storage when the `preview` parameter is specified.

Table 116. storage-preview properties

Name	Type	Description
storage-type	string	• `Linear`: The disk group acts as a linear pool. • `Virtual`: The disk group is in a virtual pool.
storage-type-numeric	uint32	Numeric equivalents for storage-type values. • `0`: Linear • `1`: Virtual
suggestions	string	Suggestions to consider before provisioning, if any.
disk-groups-preview	Embedded; see disk-groups-preview.	
adapt-expand-preview	Embedded; see adapt-expand-preview.	
spares-preview	Embedded; see spares-preview.	
unused-disks-preview	Embedded; see unused-disks-preview.	

support-assist

This basetype is used by `show support-assist`.

Table 117. support-assist properties

Name	Type	Description
support-assist-state	string	The current state of SupportAssist: • `Disabled` • `Running` • `Paused`
support-assist-state-numeric	uint32	Numeric equivalents for support-assist-state values: • `0: Disabled` • `1: Running` • `2: Paused`
support-assist-operation-mode	string	The SupportAssist operation mode. • `Normal`: The service is operating normally. • `Maintenance`: Maintenance mode is automatically enabled during maintenance activities such as a firmware update or a user-initiated controller restart. In addition, a user can put the system into maintenance mode manually to notify SupportAssist not to create support tickets during planned system downtime.
support-assist-operation-mode-numeric	uint32	Numeric equivalents for `support-assist-operation-mode` values. • `0`: Maintenance • `1`: Normal
last-logs-send-status	string	The status of the last SupportAssist logs upload.

Table 117. support-assist properties (continued)

Name	Type	Description
last-logs-send-time	string	The date and time of the last SupportAssist logs upload.
last-logs-send-time-numeric	uint32	Unformatted `last-logs-send-time` value.
last-event-send-status	string	The status of the last SupportAssist event upload.
last-event-send-time	string	The date and time of the last SupportAssist event upload.
last-event-send-time-numeric	uint32	Unformatted `last-logs-send-time` value.
last-event-send-status	string	The status of the last SupportAssist event upload.
last-event-send-time	string	The date and time of the last SupportAssist event upload.
last-event-send-time-numeric	uint32	Unformatted `last-event-send-time` value.
proxy-information	Embedded; see proxy-information.	
contact-information	Embedded; see contact-information.	

syslog-parameters

This basetype is used by `show syslog-parameters`.

Table 118. syslog-parameters properties

Name	Type	Description
syslog-host	string	The IP address of the remote syslog server to use for the notifications.
syslog-notification-level	string	Shows the minimum severity for which the system sends notifications: • `crit`: Sends notifications for Critical events only. • `error` : Sends notifications for Error and Critical events. • `warn`: Sends notifications for Warning, Error, and Critical events. • `resolved`: Sends notifications for Resolved, Warning, Error, and Critical events. • `info` : Sends notifications for all events. • `none`: Disables syslog notification and clears the settings.
syslog-notification-level-numeric	uint32	Numeric equivalents for `syslog-notification-level` values. • `0: info` • `1: resolved` • `2: warn` • `3: error` • `4: crit`
syslog-host-port	uint32	The port on which the remote syslog facility is expected to listen for notifications.

system

This basetype is used by `show configuration` and `show system`.

Table 119. system properties

Name	Type	Description
system-name	string	The name of the storage system.
system-contact	string	The name of the system administrator.
system-location	string	The location of the system.

Table 119. system properties (continued)

Name	Type	Description
system-information	string	A brief description of what the system is used for or how it is configured.
midplane-serial-number	string	The serial number of the controller enclosure midplane.
vendor-name	string	The vendor name.
product-id	string	The product model identifier.
product-brand	string	The product brand name.
scsi-vendor-id	string	The vendor name returned by the SCSI `INQUIRY` command.
scsi-product-id	string	The product identifier returned by the SCSI `INQUIRY` command.
enclosure-count	uint32	The number of enclosures in the system.
health	string	• `OK` • `Degraded` • `Fault` • `N/A` • `Unknown`
health-numeric	uint32	Numeric equivalents for `health` values. • `0: OK` • `1: Degraded` • `2: Fault` • `3: Unknown` • `4: N/A`
health-reason	string	If Health is not `OK` , the reason for the health state.
other-MC-status	string	The operational status of the Management Controller in the partner controller. This is not factored into system health. • `Operational` • `Not Operational` • `Not Communicating` • `Unknown`
other-MC-status- numeric	uint32	Numeric equivalents for `other-mc-status` values. • `1524: Not Communicating` • `3231: Not Operational` • `4749: Operational` • `1496: Unknown`
pfuStatus	string	Shows whether partner firmware update is running on the system, or is idle.
supported-locales	string	Supported display languages.
current-node-wwn	string	Storage system node World Wide Name (WWNN).
fde-security-status	string	• `Unsecured` : The system has not been secured with a passphrase. • `Secured` : The system has been secured with a passphrase. • `Secured, Lock Ready` : The system has been secured and lock keys have been cleared. The system will become locked after the next power cycle. • `Secured, Locked` : The system is secured and the disks are locked to data access, preventing their use.
fde-security-status-numeric	uint32	Numeric equivalents for `fde-security-status` values. • `1: Unsecured` • `2: Secured`

Table 119. system properties (continued)

Name	Type	Description
		• 3: Secured, Lock Ready • 4: Secured, Locked
platform-type	string	Platform type.
platform-type-numeric	uint32	Numeric equivalent for the platform-type value.
platform-brand	string	Active platform brand of the Management Controller firmware.
platform-brand-numeric	uint32	Numeric equivalent for the platform-brand value.
redundancy-mode	Embedded; see redundancy.	
unhealthy-component	Embedded; see unhealthy-component.	

system-parameters-table

This basetype is used by show system-parameters.

Table 120. system-parameters-table properties

Name	Type	Description
ulp-enabled	string	Shows true to indicate that the system is using Unified LUN Presentation, which can expose all LUNs through all host ports on both controllers. The interconnect information is managed in the controller firmware. ULP appears to the host as an active-active storage system where the host can choose any available path to access a LUN regardless of disk group ownership. When ULP is in use, the system's operating/cache-redundancy mode is shown as Active- Active ULP. ULP uses the T10 Technical Committee of INCITS Asymmetric Logical Unit Access (ALUA) extensions, in SPC-3, to negotiate paths with aware host systems. Unaware host systems see all paths as being equal.
profiles-enabled	string	Shows whether host profiles are enabled. • true: Host profiles are enabled. • false: Host profiles are disabled.
max-ports	uint32	Number of host-interface ports in the controller enclosure.
max-drives	uint32	Number of disks that the system supports.
max-volumes	uint32	Number of volumes that the system supports.
max-vdisks	uint32	Number of linear disk groups that the system supports.
max-luns	uint32	Number of LUNs that the system supports.
max-owned-arrays-per-controller	uint32	Number of linear disk groups that each controller supports.
max-storage-pools-per-controller	uint32	The number of virtual pools that each controller supports.
max-components-per-storage-pool	uint32	The number of virtual pools that each pool can contain.
max-storage-pool- size	string	The maximum size of a virtual pool.
max-storage-pool- size-numeric	uint64	Unformatted max-storage-pool-size value in blocks.
max-capi-arrays	uint32	Same as max-vdisks .
max-chunk-size	uint32	Maximum chunk size for disk groups.
min-chunk-size	uint32	Minimum chunk size for disk groups.

Table 120. system-parameters-table properties (continued)

Name	Type	Description
physical-position-offset	uint32	Starting index for physical components (enclosures, disks, etc.) in the storage system.
backoff-percentage	uint32	Percentage of disk capacity that is reserved to compensate for minor capacity differences between disk drives so they can be used interchangeably. This is not settable by users.
vdisk-metadata-size-perdisk-blocks	uint32	Amount of space reserved on a disk for metadata, in blocks.
vdisk-metadata-size-blocks	uint32	Amount of metadata, in blocks, stored on each disk.
max-host-groups	uint32	The number of host groups that the system supports.
max-hosts-per-host-group	uint32	The maximum number of hosts that a host group can contain.
max-initiator	uint32	The maximum number of initiators that a host can contain.
max-volume-groups-per-controller	uint32	The maximum number of volume groups that each controller supports.
max-volumes-per-volume-group	uint32	The maximum number of volumes that a volume group can contain.
max-replication-sets	uint32	Number of replication sets that the system supports.
max-enclosures	uint32	Number of enclosures that the system supports.
local-controller	string	The ID of the controller you are accessing. • `A`: Controller A. • `B`: Controller B.
local-controller-numeric	uint32	Numeric equivalents for `local-controller` values. • `0: B` • `1: A`
serial-number	string	Last six digits of the midplane serial number.
external-targetid-control	string	Not used.
external-targetid-control-numeric	uint32	Not used.
lan-heartbeat	string	Not used.
lan-heartbeat-numeric	uint32	Not used.
ip-address-mode	string	• `CAPI_TWO_IP_ADDRESSES_MODE`: Dual controller system has a unique IP address for each controller. • `CAPI_ONE_IP_ADDRESS_MODE`: Dual controller system has the same IP address for both controllers, only one active at a time.
ip-address-mode-numeric	uint32	Numeric equivalents for `lan-heartbeat` values. • `0: CAPI_TWO_IP_ADDRESSES_MODE` • `1: CAPI_ONE_IP_ADDRESS_MODE`
debug-flags	uint32	For use by service personnel.
enclosure-flags	uint32	For internal use only.
num-global-spares	uint32	Number of global-spare disks defined in the storage system.
dynamic-spare-rescan-rate	uint32	Interval at which the system is scanned for disks automatically designated as spares, if the dynamic spares feature is enabled.
performance-tuning-flags	string	For internal use only.

Table 120. system-parameters-table properties (continued)

Name	Type	Description
performance-tuning-flags-numeric	uint32	Numeric equivalents for `performance-tuning` values. • `0: Disabled` • `1: Enabled`
min-backing-store-size	uint32	Not applicable.
max-task-retention-count	uint32	Maximum retention count for a task that creates snapshots or replication volumes.
max-fc-speed	string	Maximum FC host-port speed.
max-fc-speed-numeric	uint32	Numeric equivalent for the `max-fc-speed` value.
max-iscsi-speed	string	Maximum iSCSI host-port speed.
max-iscsi-speed-numeric	uint32	Numeric equivalent for the `max-iscsi-speed` value.
max-peers-allowed	uint32	The maximum number of peer connections that the system supports.
peers-in-use-count	uint32	The number of peer connections present in the system.
max-ar-vols-allowed	uint32	The maximum number of virtual replication volumes that the system supports.
ar-sets-in-use-count	uint32	The number of virtual replication volumes present in the system.
linear-replication-configured	string	Not applicable.
linear-replication-configured-numeric	uint32	Not applicable.
virtual-replication-configured	string	• `False`: No virtual replication sets exist on the system. • `True`: At least one virtual replication set exists on the system.
virtual-replication-configured-numeric	uint32	Numeric equivalents for `virtual-replication-configured` values. • `0: False` • `1: True`
max-adapt-drives-per-disk-group	uint32	The maximum number of disks that an ADAPT disk group can contain.
min-adapt-drives-per-disk-group	uint32	The minimum number of disks that an ADAPT disk group can contain.
max-adapt-disk-groups-per-system	uint32	The maximum number of ADAPT disk groups that the system supports.
max-adapt-drives-per-expansion	uint32	The maximum number of disks by which an ADAPT disk group can be expanded.

tasks

This basetype is used by `show tasks`.

Table 121. tasks properties

Name	Type	Description
name	string	Task name.
type	string	Type of operation this task performs. • `TakeSnapshot` • `ResetSnapshot` • `Replicate` • `EnableDSD`

Table 121. tasks properties (continued)

Name	Type	Description
		• `DisableDSD`
status	string	Task status. • `Uninitialized`: Task is not yet ready to run. • `Ready`: Task is ready to run. • `Active`: Task is running. • `Error`: Task has an error. • `Complete`: For a TakeSnapshot task only, the task is complete but not yet ready to run again. • `Deleted`: The task is expired but this state is not yet synchronized to the partner controller.

state	string	Current step of the task.
		• For an `EnableDSD` or `DisableDSD` task:
		  ○ `Start`
		• For a `TakeSnapshot` task:
		  ○ `Start`
		  ○ `VerifyVolume`
		  ○ `ValidateLicensingLimit`
		  ○ `CreateName`
		  ○ `CreateSnap`
		  ○ `VerifySnap`
		  ○ `InspectRetention`
		  ○ `FindOldestSnap`
		  ○ `UnmapSnap`
		  ○ `ResetSnap`
		  ○ `RenameSnap`
		• For a `ResetSnapshot` task:
		  ○ `Start`
		  ○ `VerifySnap`
		  ○ `UnmapSnap`
		  ○ `ResetSnap`
		• For a `Replicate` task:
		  ○ `Idle`
		  ○ `Replicate`
		  ○ `VerifyRunning`

error-message	string	• If an error occurred while processing the task, the error message. • Blank if no error has occurred.
associated-vdisk-serial	string	Not applicable.
task-details	Embedded; see cs-replicate-tasks, reset-snapshot-tasks, snap-tasks, snapshot-with-retention-tasks.	

tier-hist-statistics

This basetype is used by show pool-statistics when the historical parameter is specified.

Table 122. tier-hist-statistics properties

Name	Type	Description
number-of-ios	uint64	Total number of read and write operations since the last sampling time.
number-of-reads	uint64	Number of read operations since the last sampling time.

Table 122. tier-hist-statistics properties (continued)

Name	Type	Description
number-of-writes	uint64	Number of write operations since the last sampling time.
total-data-transferred	string	Total amount of data read and written since the last sampling time.
total-data-transferred-numeric	uint64	Unformatted `total-data-transferred` value.
data-read	string	Amount of data read since the last sampling time.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	Amount of data written since the last sampling time.
data-written-numeric	uint64	Unformatted `data-written` value.
total-iops	uint64	Total number of read and write operations per second since the last sampling time.
read-iops	uint64	Number of read operations per second since the last sampling time.
write-iops	uint64	Number of write operations per second since the last sampling time.
total-bytes-per-sec	string	Total data transfer rate, in bytes per second, since the last sampling time.
total-bytes-per-sec-numeric	uint64	Unformatted `total-bytes-per-second` value.
read-bytes-per-sec	string	Data transfer rate, in bytes per second, for read operations since the last sampling time.
read-bytes-per-sec-numeric	uint64	Unformatted `read-bytes-per-second` value.
write-bytes-per-sec	string	Data transfer rate, in bytes per second, for write operations last sampling time.
write-bytes-per-sec-numeric	uint64	Unformatted `write-bytes-per-second` value.
number-of-allocated-pages	uint64	The number of 4 MB pages allocated to volumes in the pool.
number-of-page-moves-in	uint64	The number of pages moved into this tier from a different tier.
number-of-page-moves-out	uint64	The number of pages moved out of this tier to other tiers.
number-of-page-rebalances	uint64	The number of pages moved between disks in this tier to automatically load balance.
number-of-initial-allocations	uint64	The number of 4 MB pages that are allocated as a result of host writes. This number does not include pages allocated as a result of background tiering page movement. (Tiering moves pages from one tier to another, so one tier will see a page deallocated, while another tier will show pages allocated. These background moves are not considered initial allocations.)
number-of-unmaps	uint64	The number of 4 MB pages that are automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).
number-of-rfc-copies	uint64	The number of 4 MB pages copied from spinning disks to SSD read cache (read flash cache).
number-of-zero-pages-reclaimed	uint64	The number of empty (zero-filled) pages that were reclaimed during this sample period.
sample-time	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when the data sample was taken.
sample-time-numeric	uint32	Unformatted `sample-time` value.

tier-statistics

This basetype is used by `show tier-statistics` and `show pool-statistics`.

Table 123. tier-statistics properties

Name	Type	Description
serial-number	string	The serial number of the tier or pool.
pool	string	The name of the pool.
tier	string	• `Archive`: The lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • `Performance`: The highest storage tier, which uses SSDs (high speed). • `Read Cache`: The tier that provides read cache for a storage pool. • `Standard` : The tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).
tier-numeric	uint32	Numeric equivalents for `tier` values. • `0: N/A` • `1: Performance` • `2: Standard` • `4: Archive` • `8: Read Cache`
pages-alloc-per-minute	uint32	The rate, in pages per minute, at which pages are allocated to volumes in the pool because they need more space to store data.
pages-dealloc-per-minute	uint32	The rate, in pages per minute, at which pages are deallocated from volumes in the pool because they no longer need the space to store data.
pages-reclaimed	uint32	The number of 4 MB pages that have been automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).
num-pages-unmap-per-minute	uint32	The number of 4 MB pages that host systems have unmapped per minute, through use of the SCSI `UNMAP` command, to free storage space as a result of deleting files or formatting volumes on the host.
resettable-statistics	Embedded; see resettable-statistics.	

tier-summary

This basetype is used by show pool-statistics when the historical parameter is specified.

Table 124. tier-summary properties

Name	Type	Description
serial-number	string	The serial number of the pool.
pool	string	The name of the pool.
tier	string	• `Archive`: The lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • `Performance` : The highest storage tier, which uses SSDs (high speed). • `Read Cache`: The tier that provides read cache for a storage pool. • `Standard`: The tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).
tier-numeric	uint32	Numeric equivalents for `tier` values. • `0: N/A` • `1: Performance`

Table 124. tier-summary properties (continued)

Name	Type	Description
		• 2: Standard • 4: Archive • 8: Read Cache
tier-hist-statistics	Embedded; see tier-hist-statistics.	
readcache-hist-statistics	Embedded; see readcache-hist-statistics	

tiers

This basetype is used by `show pools` and `show tiers`.

Table 125. tiers properties

Name	Type	Description
serial-number	string	The serial number of the tier.
pool	string	The name of the pool.
tier	string	• `Archive`: The lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • `Performance`: The highest storage tier, which uses SSDs (high speed). • `Read Cache`: The tier that provides read cache for a storage pool. • `Standard`: The tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).
tier-numeric	uint32	Numeric equivalents for `tier` values. • 0: N/A • 1: Performance • 2: Standard • 4: Archive • 8: Read Cache
pool-percentage	uint8	The percentage of pool capacity that the tier occupies.
diskcount	uint8	The number of disks in the tier.
raw-size	string	The raw capacity of the disks in the tier, irrespective of space reserved for RAID overhead and so forth, formatted to use the current base, precision, and units.
raw-size-numeric	uint64	Unformatted `raw-size` value in blocks.
total-size	string	The total capacity of the tier.
total-size-numeric	uint64	Unformatted `total-size` value in blocks.
allocated-size	string	The amount of space currently allocated to volumes in the tier.
allocated-size- numeric	uint64	Unformatted `allocated-size` value in blocks.
available-size	string	The available capacity in the tier.
available-size-numeric	uint64	Unformatted `available-size` value in blocks.
affinity-size	string	The total size of volumes configured to have affinity for that tier.
affinity-size-numeric	uint64	Unformatted `affinity-size` value in blocks.

time-settings-table

This basetype is used by `show controller-date`.

Table 126. time-settings-table properties

Name	Type	Description
date-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), reported by the controller being accessed.
date-time-numeric	uint32	Unformatted `date-time` value.
time-zone-offset	string	The system time zone as an offset in hours and minutes from UTC. This is shown only if NTP is enabled.
ntp-state	string	Shows whether Network Time Protocol (NTP) is in use. • `activated`: NTP is enabled. • `deactivated`: NTP is disabled.
ntp-address	string	NTP server IP address, or 0.0.0.0 if not set.

unhealthy-component

This basetype is used by all commands that show component health.

Table 127. unhealthy-component properties

Name	Type	Description
component-type	string	Component type. • `super-cap`: Supercapacitor pack • `MC` : Management Controller • `port` : Host port • `controller`: Controller module • `expansion module`: Expansion module • `PSU`: Power supply unit • `disk`: Disk • `enclosure`: Enclosure • `vdisk` : Disk group (v2) • `disk group`: Disk group (v3) • `fan` • `CompactFlash` • `disk slot` • `SAS port` • `sensor` • `network port` • `virtual pool` • `virtual disk group` • `volume` • `volume`: Source volume • `snapshot` • `host` • `volume map` • `system`
component-type-numeric	uint32	Numeric equivalents for `component-type` values. • `0: super-cap`

Table 127. unhealthy-component properties (continued)

Name	Type	Description
		• 1: MC • 2: port • 3: controller • 4: expansion module • 5: PSU • 6: disk • 7: enclosure • 8: vdisk (v2) or disk group (v3) • 9: fan • 10: CompactFlash • 11: disk slot • 12: SAS port • 13: sensor • 14: network port • 15: virtual pool • 16: virtual disk group • 17: volume • 19: volume (source volume) • 20: snapshot • 21: host • 25: volume map • 26: system
component-id	string	Component identifier, such as A for controller A.
basetype	string	Component basetype.
primary-key	string	Durable ID of the component.
health	string	Component health. • OK • Degraded • Fault • Unknown • N/A
health-numeric	uint32	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown • 4: N/A
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.

unused-disks-preview

This basetype is used by add storage when the preview parameter is specified.

Table 128. unused-disks-preview properties

Name	Type	Description
location	string	Disk enclosure ID and slot number.
type	string	Disk description. • `SAS`: Enterprise SAS spinning disk. • `SAS MDL`: Midline SAS spinning disk. • `SSD SAS`: SAS solid-state disk.
type-numeric	uint32	Numeric equivalents for description values. • `4`: SAS • `8`: SSD SAS • `11`: SAS MDL
tier	string	• `Archive`: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • `Performance`: The disk group is in the highest storage tier, which uses SSDs (high speed). • `Read Cache`: The disk is an SSD providing high-speed read cache for a storage pool. • `Standard`: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity)
tier-numeric	uint32	Numeric equivalents for storage-tier values. • `0`: N/A • `1`: Permance • `2`: Standard • `4`: Archive • `8`: Read Cache
size	string	Disk group capacity, formatted to use the current base, precision, and units.
size-numeric	uint64	Unformatted size value in blocks.
rpm	uint32	The speed of a spinning disk, in thousands of revolutions per minute, as specified by the disk vendor. For an SSD, 0 is shown.
sector-format	string	The disk sector format. • `512n`: The disk uses 512-byte native sector size. Each logical block and physical block is 512 bytes. • `512e`: The disk uses 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.
sector-format-numeric	uint32	Numeric equivalents for `sector-format` values. • `0`: 512n • `1`: 512e
fde-state	string	The FDE state of the disk • `Unknown`: The FDE state is unknown. • `Not FDE Capable`: The disk is not FDE-capable • `Not Secured`: The disk is not secured. • `Secured, Unlocked`: The system is secured and the disk is unlocked. • `Secured, Locked`: The system is secured and the disk is locked to data access, preventing its use. • `FDE Protocol Failure`: A temporary state that can occur while the system is securing the disk.
fde-state-numeric	uint32	Numeric equivalents for `fde-state` values. • `0`: Not FDE Capable

Table 128. unused-disks-preview properties (continued)

Name	Type	Description
		• 1: Not Secured • 2: Secured, Unlocked • 3: Secure, Locked • 4: FDE Protocol Failure • 5: Unknown

unwritable-cache

This basetype is used by `show unwritable-cache`.

Table 129. unwritable-cache properties

Name	Type	Description
unwritable-a-percentage	uint8	The percentage of cache space occupied by unwritable data in controller A.
unwritable-b-percentage	uint8	The percentage of cache space occupied by unwritable data in controller B.

users

This basetype is used by `show users`.

Table 130. users properties

Name	Type	Description
username	string	User name.
roles	string	• `monitor`: User can view but not change system settings. • `manage`: User can view and change system settings. • `diagnostic`: User can view and change system settings.
user-type	string	The experience level of the user: `Novice` , `Standard` , `Advanced` , or `Diagnostic` . This parameter does not affect access to commands.
user-type-numeric	string	Numeric equivalents for `user-type` values. • `1: Novice` • `2: Standard` • `3: Advanced` • `4: Diagnostic`
user-locale	string	The display language.
user-locale-numeric	string	Numeric equivalents for `user-locale` values • `0: English` • `3: Spanish` • `4: French` • `5: German` • `7: Japanese` • `8: Korean` • `11: Chinese-simplified`
interface-access-WBI	string	• `x`: User can access the PowerVault Manager web-browser interface. • (blank): User cannot access this interface.
interface-access-CLI	string	• `x`: User can access the command-line interface. • (blank): User cannot access this interface.

Table 130. users properties (continued)

Name	Type	Description
interface-access-FTP	string	• x: User can access the FTP interface. • (blank): User cannot access this interface.
interface-access-SMIS	string	• x : User can access the Storage Management Initiative Specification (SMI-S) interface. • (blank): User cannot access this interface.
interface-access-SNMP	string	• U: The user can access the SNMPv3 interface and view the MIB. • T: The user can access the SNMPv3 interface and receive trap notifications. • (blank): User cannot access this interface.
storage-size-base	uint8	The base for entry and display of storage-space sizes: • 2: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude. • 10: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. Operating systems usually show volume size in base 2. Disk drives usually show size in base 10. Memory (RAM and ROM) size is always shown in base 2.
storage-size-precision	uint8	The number of decimal places (1-10) for display of storage-space sizes.
storage-size-units	string	The unit for display of storage-space sizes. • auto: Lets the system determine the proper unit for a size. • MB: Megabytes. • GB: Gigabytes. • TB: Terabytes. Based on the precision setting, if the selected unit is too large to meaningfully display a size, the system uses a smaller unit for that size. For example, if units is set to TB, precision is set to 1, and base is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.
temperature-scale	string	• Celsius: Use the Celsius scale to display temperature values. • Fahrenheit: Use the Fahrenheit scale to display temperature values.
timeout	uint32	Time in seconds that the session can be idle before it automatically ends. Valid values are 120-43200 seconds (2-720 minutes).
authentication-type	string	For an SNMPv3 user, this specifies whether to use a security authentication protocol. Authentication uses the user password • none: No authentication. • MD5: MD5 authentication. • SHA: SHA-1 authentication.
privacy-type	string	For an SNMPv3 user, this specifies whether to use a security encryption protocol. This parameter requires the privacy-password property and the authentication-type property. • none : No encryption. • DES : Data Encryption Standard. • AES : Advanced Encryption Standard.
password	string	User password. For a standard user the password is represented by eight asterisks. For an SNMPv3 user this is the authentication password.
default-password-changed	string	Shows whether the default password for the user has been changed. • False • True
default-password-changed-numeric	uint32	Numeric equivalents for default-password-changed values. • 0: False • 1: True

Table 130. users properties (continued)

Name	Type	Description
privacy-password	string	Encryption password for an SNMPv3 user whose privacy type is set to DES or AES .
trap-destination	string	For an SNMPv3 user whose `interface-access-SNMP` property is set to `snmptarget`, this specifies the IP address of the host that will receive SNMP traps.

vdisk-hist-statistics

This basetype is used by `show vdisk-statistics` when the `historical` parameter is specified.

Table 131. vdisk-hist-statistics properties

Name	Type	Description
total-data-transferred	string	Total amount of data read and written since the last sampling time.
total-data-transferred-numeric	uint64	Unformatted `total-data-transferred` value.
data-read	string	Amount of data read since the last sampling time.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	Amount of data written since the last sampling time.
data-written-numeric	uint64	Unformatted `data-written` value.
total-bytes-per-sec	string	Data transfer rate, in bytes per second, since the last sampling time. This is the sum of read-bytes-per-second and write-bytes-per-second.
total-bytes-per-sec-numeric	uint64	Unformatted `total-bytes-per-second` value.
read-bytes-per-sec	string	Data transfer rate, in bytes per second, for read operations since the last sampling time.
read-bytes-per-sec-numeric	uint64	Unformatted `read-bytes-per-second` value.
write-bytes-per-sec	string	Data transfer rate, in bytes per second, for write operations since the last sampling time.
write-bytes-per-sec-numeric	uint64	Unformatted `write-bytes-per-second` value.
sample-time	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when the data sample was taken..
sample-time-numeric	uint32	Unformatted `sample-time` value.

vdisk-statistics

This basetype is used by `show vdisk-statistics` when the `historical` parameter is omitted.

Table 132. vdisk-statistics properties

Name	Type	Description
name	string	The name of the disk group.
serial-number	string	The serial number of the disk group.
bytes-per-second	string	Data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

Table 132. vdisk-statistics properties (continued)

Name	Type	Description
bytes-per-second- numeric	uint64	Unformatted `bytes-per-second` value.
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
number-of-reads	uint64	Number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	Number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written- numeric	uint64	Unformatted `data-written` value.
avg-rsp-time	uint32	Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.
avg-read-rsp-time	uint32	Average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.
avg-write-rsp-time	uint32	Average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.
reset-time	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	uint32	Unformatted `reset-time` value.
start-sample-time	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when sampling started for the iops and bytes-per-second values.
start-sample-time- numeric	uint32	Unformatted `start-sample-time` value.
stop-sample-time	string	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when sampling stopped for the iops and bytes-per-second values.
stop-sample-time- numeric	uint32	Unformatted `stop-sample-time` value.

versions

This basetype is used by `show configuration` and `show versions`.

Table 133. versions properties

Name	Type	Description
sc-cpu-type	string	Storage Controller processor type.
bundle-version	string	Firmware bundle version.
bundle-base-version	string	Firmware bundle base version.
build-date	string	Firmware bundle build date.
sc-fw	string	Storage Controller firmware version.
sc-baselevel	string	Storage Controller firmware base level.
sc-memory	string	Storage Controller memory-controller FPGA firmware version.

Table 133. versions properties (continued)

Name	Type	Description
sc-fu-version	string	Storage Controller FU processor version.
sc-loader	string	Storage Controller loader firmware version.
capi-version	string	Configuration API (CAPI) version.
mc-fw	string	Management Controller firmware version.
mc-loader	string	Management Controller loader firmware version.
mc-base-fw	string	Management Controller firmware base level.
fw-default-platform-brand	string	Default platform brand of the Management Controller firmware.
fw-default-platform-brand-numeric	uint32	Numeric equivalents for `fw-default-platform-brand` values.
ec-fw	string	Expander Controller firmware version.
pld-rev	string	Complex Programmable Logic Device (CPLD) firmware version.
prm-version	string	CPLD Power Reset Manager (PRM) version.
hw-rev	string	Controller hardware version.
him-rev	string	Host interface module revision.
him-model	string	Host interface module model.
backplane-type	uint8	Backplane type.
host-channel_revision	uint8	Host interface hardware (chip) version.
disk-channel_revision	uint8	Disk interface hardware (chip) version.
mrc-version	string	Memory Reference Code (MRC) version for Storage Controller boot Flash.
ctk-version	string	• *version*: Customization Toolkit (CTK) version applied to the system. • `No CTK present`: No CTK version has been applied to this system.

virtual-disk-summary

This basetype is used by `show vdisk-statistics` when the `historical` parameter is specified.

Table 134. virtual-disk-summary properties

Name	Type	Description
name	string	The name of the disk group.
serial-number	string	The serial number of the disk group.
vdisk-hist-statistics	Embedded; see vdisk-hist-statistics.	

virtual-disks

This basetype is used by `show configuration` and `show vdisks`.

Table 135. virtual-disks properties

Name	Type	Description
name	string	The name of the disk group.
blocksize	uint32	The size of a block, in bytes.

Table 135. virtual-disks properties (continued)

Name	Type	Description
size	string	The size of the disk group, formatted to use the current base, precision, and units.
size-numeric	uint64	Unformatted `size` value in blocks.
freespace	string	Amount of free (available) space in the disk group, formatted to use the current base, precision, and units.
freespace-numeric	uint64	Unformatted `freespace` value in blocks.
owner	string	Either the preferred owner during normal operation or the partner controller when the preferred owner is offline. • `A`: Controller A. • `B`: Controller B.
owner-numeric	uint32	Numeric equivalents for `owner` values. • `0: B` • `1: A`
preferred-owner	string	Controller that owns the disk group and its volumes during normal operation. • `A`: Controller A. • `B`: Controller B.
preferred-owner- numeric	uint32	Numeric equivalents for `preferred-owner` values. • `0: B` • `1: A`
raidtype	string	The disk-group RAID level. • `NRAID` • `RAID0` • `RAID1` • `RAID3` • `RAID5` • `RAID6` • `RAID10` • `RAID50` • `ADAPT`
raidtype-numeric	uint32	Numeric equivalents for `raidtype` values. • `0: RAID0` • `1: RAID1` • `2: ADAPT` • `3: RAID3` • `5: RAID5` • `6: NRAID` • `8: RAID50` • `10: RAID10` • `11: RAID6`
storage-type	string	• `Linear`: The disk group acts as a linear pool. • `Virtual`: The disk group is in a virtual pool.
storage-type- numeric	uint32	Numeric equivalents for `storage-type` values. • `0: Linear` • `1: Virtual`
diskcount	uint16	Number of disks in the disk group.
sparecount	uint16	Number of spare disks assigned to the disk group.

Table 135. virtual-disks properties (continued)

Name	Type	Description
chunksize	string	• For RAID levels except NRAID, RAID 1, and RAID 50, the configured chunk size for the disk group. • For NRAID and RAID 1, chunk size has no meaning and is therefore shown as not applicable (N/A). • For RAID 50, the disk-group chunk size calculated as: *configured-chunk-size x (subgroup-members- 1)* . For a disk group configured to use 64-KB chunk size and 4-disk subgroups, the value would be 192k (64KB x 3).
status	string	Disk-group status. • `CRIT`: Critical. The disk group is online but isn't fault tolerant because some of its disks are down. • `DMGD`: Damaged. The disk group is online and fault tolerant, but some of its disks are damaged. • `FTDN`: Fault tolerant with a down disk. The disk group is online and fault tolerant, but some of its disks are down. • `FTOL`: Fault tolerant and online. • `MSNG`: Missing. The disk group is online and fault tolerant, but some of its disks are missing. • `OFFL`: Offline. Either the disk group is using offline initialization, or its disks are down and data may be lost. • `QTCR`: Quarantined critical. The disk group is critical with at least one inaccessible disk. For example, two disks are inaccessible in a RAID-6 disk group or one disk is inaccessible for other fault-tolerant RAID levels. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN , the disk group is automatically dequarantined. • `QTDN`: Quarantined with a down disk. The RAID-6 disk group has one inaccessible disk. The disk group is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN , the disk group is automatically dequarantined. • `QTOF`: Quarantined offline. The disk group is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 disk group. • `STOP`: The disk group is stopped. • `UP`: Up. The disk group is online and does not have fault-tolerant attributes. • `UNKN`: Unknown.
status-numeric	uint32	Numeric equivalents for `status` values. • `0: FTOL` • `1: FTDN` • `2: CRIT` • `3: OFFL` • `4: QTCR` • `5: QTOF` • `6: QTDN` • `7: STOP` • `8: MSNG` • `9: DMGD` • `250: UP` • *`other`*`: UNKN`
lun	uint32	Deprecated.
min-drive-size	string	Minimum disk size that can this disk group can use, formatted to use the current base, precision, and units.

Table 135. virtual-disks properties (continued)

Name	Type	Description
min-drive-size-numeric	uint64	Unformatted `min-drive-size` value in blocks.
create-date	string	Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), when the disk group was created.
create-date-numeric	uint32	Unformatted `create-date` value.
cache-read-ahead	string	Deprecated.
cache-read-ahead-numeric	uint64	Deprecated.
cache-flush-period	uint32	Deprecated.
read-ahead-enabled	string	Deprecated.
read-ahead-enabled-numeric	uint32	Deprecated.
write-back-enabled	string	Deprecated.
write-back-enabled-numeric	uint32	Deprecated.
job-running	string	Same as current-job.
current-job	string	Job running on the disk group, if any. • (blank): No job is running. • `DRSC`: A disk is being scrubbed. • `EXPD`: The disk group is being expanded. • `INIT`: The disk group is initializing. • `RBAL`: The ADAPT disk group is being rebalanced. • `RCON`: At least one disk in the disk group is being reconstructed. • `VDRAIN`: The virtual disk group is being removed and its data is being drained to another disk group. • `VPREP`: The virtual disk group is being prepared for use in a virtual pool. • `VRECV`: The virtual disk group is being recovered to restore its membership in the virtual pool. • `VREMV`: The disk group and its data are being removed. • `VRFY`: The disk group is being verified. • `VRSC`: The disk group is being scrubbed.
array-drive-type-numeric	uint32	Numeric equivalents for `array-drive-type` values. • `1: MIXED` • `4: SAS` • `8: sSAS` • `11: SAS MDL`
disk-description	string	Disk description. • `SAS`: Enterprise SAS spinning disk. • `SAS MDL`: Midline SAS spinning disk. • `SSD SAS`: SAS solid-state disk.
disk-description-numeric	uint32	Numeric equivalents for description values. • `1`: MIX • `4`: SAS • `8`: SSD SAS • `11`: SAS MDL
is-job-auto-abortable	string	• `false`: The current job must be manually aborted before you can delete the disk group. • `true`: The current job will automatically abort if you delete the disk group.
is-job-auto-abortable-numeric	uint32	Numeric equivalents for `is-job-auto-abortable` values.

Table 135. virtual-disks properties (continued)

Name	Type	Description
		• `0: false` • `1: true`
serial-number	string	The serial number of the disk group.
blocks	string	The number of blocks, whose size is specified by the blocksize property.
blocks-numeric	uint64	Unformatted blocks value.
disk-dsd-enable-vdisk	string	• `Disabled`: DSD is disabled for the disk group. • `Enabled - all spinning`: DSD is enabled for the disk group. • `Partial spin-down`: DSD is enabled for the disk group and its disks are partially spun down to conserve power. • `Full spin-down`: DSD is enabled for the disk group and its disks are fully spun down to conserve power.
disk-dsd-enable-vdisk-numeric	uint32	Numeric equivalents for `disk-dsd-enable-vdisk` values. • `0: Disabled` • `1: Enabled - all spinning` • `2: Partial spin-down` • `3: Full spin-down`
disk-dsd-delay-vdisk	uint32	For spinning disks, the period of inactivity after which the disks and dedicated spares in a disk group will automatically spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.
pool-sector-format	string	The sector format of disks in the disk group. • `512n`: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes. • `512e`: All disks use 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries. • `Mixed`: The disk group contains a mix of 512n and 512e disks. This is supported, but for consistent and predictable performance, do not mix disks of different sector size types (512n, 512e).
pool-sector-format-numeric	uint32	Numeric equivalents for `pool-sector-numeric` values. • `0: 512n` • `1: 512e` • `3: Mixed`
health	string	• `OK` • `Degraded` • `Fault` • `Unknown` • `N/A`
health-numeric	uint32	Numeric equivalents for `health` values. • `0: OK` • `1: Degraded` • `2: Fault` • `3: Unknown` • `4: N/A`
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended actions to take to resolve the health issue.
unhealthy-component	Embedded; see unhealthy-component.	

volume-groups

This basetype is used by `show volume-groups`.

Table 136. volume-groups

Name	Type	Description
durable-id	string	Volume group ID.
group-name	string	The name of the volume group in the format `volume-group.*` , where * represents all volumes in the group.
serial-number	string	The serial number of the volume group.
type	string	The group type, which is `Volume`.
type-numeric	uint32	Numeric equivalents for `type` values.
member-count	uint32	The number of volumes in the volume group.
replication-set- serial	string	The serial number of the replication set.
volumes	Embedded; see volumes.	

volume-group-view

This basetype is used by `show maps` if volume groups exist.

Table 137. volume-group-view properties

Name	Type	Description
durable-id	string	Volume group ID.
serial-number	string	The serial number of the volume group.
group-name	string	The name of the volume group in the format `volume-group.*` , where the * represents all volumes in the group.
volume-view- mappings	Embedded; see volume-view-mappings.	

volume-group-view-mappings

This basetype is used by show maps.

Table 138. volume-group-view-mappings properties

Name	Type	Description
durable-id	string	Mapping ID.
parent-id	string	For a mapping between a volume and an initiator, the volume ID — or if the volume is a member of a volume group, the volume-group ID.
mapped-id	string	The ID of the mapping target, such as an initiator.
ports	string	• The controller host ports to which the mapping applies. • Blank if not mapped or mapped as `no-access`.
access	string	Type of host access to the volume. • `read-write`: Read and write. • `read-only`: Read only. • `no-access`: No access (masked). • `not-mapped`: Not mapped.

Table 138. volume-group-view-mappings properties (continued)

Name	Type	Description
access-numeric	uint32	Numeric equivalents of `access` values. • `0: not-mapped` • `1: no-access` • `2: read-only` • `3: read-write`
initiator-id	string	• For an FC initiator, its WWPN. • For a SAS initiator, its WWPN. • For an iSCSI initiator, its node name (typically the IQN). • `all other initiators`: The volume's default mapping.
nickname	string	• For a host, its name in the format `host-name.*` , where the * represents all initiators in the host. • For a host group, its name in the format `host-group.*.*` , where the first * represents all hosts in the host group and the second * represents all initiators in those hosts. • Blank if not set or for `all other initiators`.
host-profile	string	`Standard`: Default profile.
host-profile-numeric	uint32	Numeric equivalents of `host-profile` values. `0: Standard`
lun-view	Embedded; see volume-view-mappings.	

volume-names

This basetype is used by show volume-names.

Table 139. volume-names properties

Name	Type	Description
volume-name	string	Volume name.
serial-number	string	Volume serial number.

volume-reservations

This basetype is used by `show volume-reservations`.

Table 140. volume-reservations

Name	Type	Description
volume-name	string	The name of the volume.
serial-number	string	The serial number of the volume.
reservation-active	string	• `Free`: The volume is not reserved. • `Reserved`: The volume has been reserved by a host.
reservation- active-numeric	uint32	Numeric equivalents for `reservation-active` values. • `0: Free` • `1: Reserved`
pgr-generation	uint32	The generation of the volume reservation, shown as a hexadecimal value.
host-id	string	• For an FC initiator, its WWPN.

Table 140. volume-reservations (continued)

Name	Type	Description
		• For a SAS initiator, its WWPN. • For an iSCSI initiator, its node name (typically the IQN).
port	string	The controller host-port identifiers.
reserve-key	string	The reservation key, shown as a hexadecimal value.
reserve-scope	string	The reservation scope, `Logical Unit` .
reserve-scope- numeric	uint32	Numeric equivalents for `reserve-scope` values. • `0: Logical Unit`
reserve-type	string	The reservation type. • `Undefined`: The volume has no persistent reservations. • `Write Exclusive`: Write commands are only allowed for a single reservation holder. • `Exclusive Access`: Certain access (read, write) commands are only allowed for a single reservation holder. • `Write Exclusive - Registrants Only`: Write commands are only allowed for registered hosts. There is a single reservation holder. • `Exclusive Access - Registrants Only`: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder. • `Write Exclusive - All Registrants`: Write commands are only allowed for registered hosts. There is a single reservation holder. • `Exclusive Access - All Registrants`: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder.
reserve-type- numeric	uint32	Numeric equivalents for `reserve-type` values. • `0: Undefined` • `1: Write Exclusive` • `3: Exclusive Access` • `5: Write Exclusive - Registrants Only` • `6: Exclusive Access - Registrants Only` • `7: Write Exclusive - All Registrants` • `8: Exclusive Access - All Registrants`

volumes

This basetype is used by `show volumes` and `show volume-groups`.

Table 141. volumes properties

Name	Type	Description
durable-id	string	Volume ID in the format V # , where # starts at 1 and increments for each new volume to uniquely identify it. The value is generated from available data in the current CLI session and may change after a Management Controller restart.
url	string	Volume URL.
virtual-disk-name	string	The name of the disk group or pool that contains the volume.
storage-pool-name	string	The name of the disk group or pool that contains the volume.
storage-pools-url	string	Pool URL.
volume-name	string	Volume name.

Table 141. volumes properties (continued)

Name	Type	Description
size	string	Volume capacity, formatted to use the current base, precision, and units.
size-numeric	uint64	Unformatted `size` value in blocks.
total-size	string	The total size of the volume.
total-size-numeric	uint64	Unformatted `total-size` value in blocks.
allocated-size	string	The amount of space currently allocated to a virtual volume, or the total size of a linear volume.
allocated-size-numeric	uint64	Unformatted `allocated-size` value in blocks.
storage-type	string	• `Linear`: The volume is in a linear pool. • `Virtual`: The volume is in a virtual pool.
storage-type-numeric	uint32	Numeric equivalents for `storage-type` values. • `0: Linear` • `1: Virtual`
preferred-owner	string	Controller that owns the volume during normal operation. • `A`: Controller A. • `B`: Controller B.
preferred-owner-numeric	uint32	Numeric equivalents for `preferred-owner` values. • `0: B` • `1: A`
owner	string	Either the preferred owner during normal operation or the partner controller when the preferred owner is offline. • `A`: Controller A. • `B`: Controller B.
owner-numeric	uint32	Numeric equivalents for `owner` values. • `0: B` • `1: A`
serial-number	string	Volume serial number.
write-policy	string	• `write-back`: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput. • `write-through`: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance.
write-policy- numeric	uint32	Numeric equivalents for `write-policy` values. • `0: write-through` • `1: write-back`
cache-optimization	string	• `standard`: This controller cache mode of operation is optimized for sequential and random I/O and is the optimization of choice for most workloads. In this mode, the cache is kept coherent with the partner controller. This mode gives you high performance and high redundancy. • `no-mirror`: In this mode of operation, the controller cache performs the same as the standard mode with the exception that the cache metadata is not mirrored to the partner. While this improves the response time of write I/O, it comes at the cost of redundancy. If this option is used, the user can expect higher write performance but is exposed to data loss if a controller fails.
cache-optimization-numeric	uint32	Numeric equivalents for `cache-optimization` values.

Table 141. volumes properties (continued)

Name	Type	Description
		• `0: standard` • `2: no-mirror`
read-ahead-size	string	The read-ahead cache setting of the volume. • `Disabled`: Read-ahead is disabled. • `Adaptive`: Adaptive read-ahead is enabled, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload. • `Stripe`: Read-ahead is set to one stripe. The controllers treat NRAID and RAID-1 disk groups internally as if they have a stripe size of 512 KB, even though they are not striped. • `512 KB , 1 MB , 2 MB , 4 MB , 8 MB , 16 MB , or 32 MB`: Size selected by a user.
read-ahead-size-numeric	uint32	Numeric equivalents for `read-ahead-size` values. • `-2: Stripe` • `-1: Adaptive` • `0: Disabled` • `524288: 512 KB` • `1048576: 1 MB` • `2097152: 2 MB` • `4194304: 4 MB` • `8388608: 8 MB` • `16777216: 16 MB` • `33554432: 32 MB` • `2147483648: Maximum`
volume-type	string	• `base`: Base volume • `standard`: Standard volume. • `snapshot`: Snapshot volume.
volume-type-numeric	uint32	Numeric equivalents for `volume-type` values. • `0: standard` • `3: snapshot` • `15: base`
volume-class	string	• `· standard`: Standard volume.
volume-class-numeric	uint32	Numeric equivalents for `volume-class` values. • `0: standard`
tier-affinity	string	• `No Affinity`: This setting uses the highest available performing tiers first and only uses the Archive tier when space is exhausted in the other tiers. Volume data will swap into higher performing tiers based on frequency of access and tier space availability • `Archive`: This setting prioritizes the volume data to the least performing tier available. Volume data can move to higher performing tiers based on frequency of access and available space in the tiers. • `Performance`: This setting prioritizes volume data to the higher performing tiers. If no space is available, lower performing tier space is used. Performance affinity volume data will swap into higher tiers based upon frequency of access or when space is made available
tier-affinity-numeric	uint32	Numeric equivalents for `tier-affinity` values. • `0: No Affinity` • `1: Archive` • `2: Performance`
snapshot	string	Shows whether the volume is a snapshot.

Table 141. volumes properties (continued)

Name	Type	Description
snapshot-retention-priority	string	The retention priority for snapshots of the volume. • `never-delete`: Snapshots will never be deleted. • `high`: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted. • `medium`: Snapshots may be deleted after all eligible low-priority snapshots have been deleted. • `low`: Snapshots may be deleted. Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion.
snapshot-retention-priority-numeric	uint32	Numeric equivalents for `retention-priority` values. • `0: never-delete` • `1: high` • `2: medium` • `3: low`
volume-qualifier	string	• `N/A`: Not applicable.
raidtype	string	The RAID level of the disk group. • `NRAID` • `RAID0` • `RAID1` • `RAID3` • `RAID5` • `RAID6` • `RAID10` • `RAID50` • `ADAPT`
raidtype-numeric	uint32	Numeric equivalents for `raidtype` values. • `0: RAID0` • `1: RAID1` • `2: ADAPT` • `3: RAID3` • `5: RAID5` • `6: NRAID` • `8: RAID50` • `10: RAID10` • `11: RAID6`
cs-replication-role	string	• `Copy Source`: The volume is the source for a volume copy operation. • `Copy Destination` : The volume is the destination for a volume copy operation. • `Primary`: The volume is the primary volume in a replication set. • `Secondary`: The volume is the secondary volume in a replication set. • (blank): Not applicable.
cs-copy-dest	string	• `Off`: Not applicable. • `On`: The volume is the destination for a volume copy operation.
cs-copy-dest-numeric	uint32	Numeric equivalents for `cs-copy-dest` values. • `0: Off` • `1: On`
cs-copy-src	string	• `Off`: Not applicable. • `On`: The volume is the source for a volume copy operation.

Table 141. volumes properties (continued)

Name	Type	Description
cs-copy-src-numeric	uint32	Numeric equivalents for `cs-copy-src` values. • `0: Off` • `1: On`
cs-primary	string	• `Off`: Not applicable. • `On`: The volume is the primary volume in a replication set.
cs-primary-numeric	uint32	Numeric equivalents for `cs-primary` values. • `0: Off` • `1: On`
cs-secondary	string	• `Off`: Not applicable. • `On`: The volume is the secondary volume in a replication set.
cs-secondary-numeric	uint32	Numeric equivalents for `cs-secondary` values. • `0: Off` • `1: On`
health	string	Numeric equivalents for `health` values. • `OK` • `Degraded` • `Fault` • `Unknown` • `N/A`
health-numeric	uint32	Numeric equivalents for `health` values. • `0: OK` • `1: Degraded` • `2: Fault` • `3: Unknown` • `4: N/A`
health-reason	string	If Health is not `OK`, the reason for the health state.
health-recommendation	string	If Health is not `OK`, the recommended actions to take to resolve the health issue.
volume-group	string	If the volume is in a volume group, the name of the group. Otherwise, `UNGROUPEDVOLUMES` .
group-key	string	If the volume is in a volume group, the durable ID of the volume group. Otherwise, `VGU` .

volume-statistics

This basetype is used by show volume-statistics.

Table 142. volume-statistics properties

Name	Type	Description
volume-name	string	The name of the volume.
serial-number	string	The serial number of the volume.
bytes-per-second	string	The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	uint64	Unformatted `bytes-per-second` value.

Table 142. volume-statistics properties (continued)

Name	Type	Description
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
number-of-reads	uint64	The number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	The number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	The amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	uint64	Unformatted `data-read` value.
data-written	string	The amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	uint64	Unformatted `data-written` value.
allocated-pages	uint32	The number of pages allocated to the volume.
percent-tier-ssd	uint16	The percentage of volume capacity occupied by data in the Performance tier.
percent-tier-sas	uint16	The percentage of volume capacity occupied by data in the Standard tier.
percent-tier-sata	uint16	The percentage of volume capacity occupied by data in the Archive tier.
percent-allocated-rfc	uint16	The percentage of volume capacity occupied by data in read cache.
pages-alloc-per-minute	uint32	The average number of pages being allocated to the volume each minute.
pages-dealloc-per-minute	uint32	The average number of pages being deallocated from the volume each minute.
shared-pages	uint32	The number of pages that are shared between this volume and any other volumes. This amount of storage will not be deallocated if the volume is deleted.
write-cache-hits	uint64	For the controller that owns the volume, the number of times the block written to is found in cache.
write-cache-misses	uint64	For the controller that owns the volume, the number of times the block written to is not found in cache.
read-cache-hits	uint64	For the controller that owns the volume, the number of times the block to be read is found in cache.
small-destages	uint64	The number of times flush from cache to disk is not a full stripe.
full-stripe-write-destages	uint64	The number of times flush from cache to disk is a full stripe.
read-ahead-operations	uint64	The number of read pre-fetch or anticipatory-read operations.
write-cache-space	uint16	The cache size used on behalf of this volume.
write-cache-percent	uint32	The percentage of cache used on behalf of this volume.
reset-time	string	The date and time, in the format *year-month-day hour:minutes:seconds*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	uint32	Unformatted `reset-time` value.
start-sample-time	string	The date and time, in the format *year-month-day hour:minutes:seconds*, when sampling started for the `iops` and `bytes-per-second` values.
start-sample-time-numeric	uint32	Unformatted start-sample-time value.

Table 142. volume-statistics properties (continued)

Name	Type	Description
stop-sample-time	string	The date and time, in the format *year-month-day hour:minutes:seconds*, when sampling stopped for the `iops` and `bytes-per-second` values
stop-sample-time-numeric	uint32	Unformatted `stop-sample-time` value.

volume-view

This basetype is used by `show maps`.

Table 143. volume-view properties

Name	Type	Description
durable-id	string	Volume ID in the format `V#`, where `#` starts at 1 and increments for each new volume to uniquely identify it. The value is generated from available data in the current CLI session and may change after a Management Controller restart.
volume-serial	string	The serial number of the volume.
volume-name	string	Volume name.
volume-view-mappings	Embedded; see volume-view-mappings.	

volume-view-mappings

This basetype is used by `show maps`.

Table 144. volume-view-mappings properties

Name	Type	Description
durable-id	string	Mapping ID.
parent-id	string	For a mapping between a volume and an initiator, the volume ID-or if the volume is a member of a volume group, the volume-group ID.
mapped-id	string	The ID of the mapping target, such as an initiator.
ports	string	• The controller host ports to which the mapping applies. • Blank if not mapped or mapped as `no-access`
lun	string	• The LUN that identifies the volume to a host. • For a volume group, * means multiple LUNs are represented in the group. • Blank if not mapped or mapped as `no-access`.
access	string	Type of host access to the volume. • `read-write` : Read and write. • `read-only` : Read only. • `no-access` : No access (masked). • `not-mapped` : Not mapped.
access-numeric	uint32	Numeric equivalents of `access` values. • `0: not-mapped` • `1: no-access` • `2: read-only` • `3: read-write`
identifier	string	• For a SAS initiator, its WWPN.

Table 144. volume-view-mappings properties (continued)

Name	Type	Description
		• For an FC initiator, its WWPN. • For an iSCSI initiator, its node name (typically the IQN). • `all other initiators` : The volume's default mapping.
nickname	string	• For a host, its name in the format `host-name.*` , where the * represents all initiators in the host. • For a host group, its name in the format `host-group.*.*` , where the first * represents all hosts in the host group and the second * represents all initiators in those hosts. • Blank if not set or for `all other initiators`.
host-profile	string	`Standard` : Default profile.
host-profile-numeric	uint32	Numeric equivalents of `host-profile` values. `0: Standard`

A

Settings changed by restore defaults

This appendix summarizes the system settings that result from using the `restore defaults` command.

Table 145. Settings changed by restore defaults

Setting	Value
System information settings: • System name • System contact • System location • System information	Settings: • Uninitialized Name • Uninitialized Contact • Uninitialized Location • Uninitialized Info
Management protocols settings: • CLI/Telnet • CLI/SSH • SLP • FTP • SFTP • SNMP • WBI/HTTP • WBI/HTTPS • SMI-S • Unsecure SMI-S • Debug • In-band SES • Activity Progress Reporting	Settings: • Disabled • Enabled • Enabled • Disabled • Enabled • Disabled • Disabled • Enabled • Disabled • Disabled • Disabled • Disabled • Disabled
Management mode	v3
Users	(preserved)
CLI session timeout	30 minutes
Tasks and schedules	(preserved)
Management Controller debug logs	(preserved)
Storage Controller event logs	(preserved)
Time/date and NTP settings	(preserved)
Network IP settings	(preserved)
SNMP settings: • SNMP trap notification level • SNMP trap host IPs • SNMP read community • SNMP write community	Settings: • none • 0.0.0.0 • public • public
SMTP settings: • Email notification • Email notify filter • Email addresses • Email server	Settings: • Disabled • (none) • (none) • (none)

Table 145. Settings changed by restore defaults (continued)

Setting	Value
• Email domain • Email sender • Include logs	• (none) • (none) • Disabled
SSL/SSH certificates	(preserved)
License	(preserved)
Disk group metadata	(preserved)
Host port settings: • FC link speed • FC topology	Settings: • Auto • Point-to-point
Host names and profiles	(preserved)
Drive spin down	Disabled
Advanced settings: • Disk group background scrub • Disk group background scrub interval • Partner firmware upgrade • Utility priority • SMART • Dynamic spare configuration • Enclosure polling rate • Host control of caching • Sync cache mode • Independent Cache mode • Missing LUN response • Controller failure • Supercap failure • CompactFlash failure • Power supply failure • Fan failure • Temperature exceeded • Partner notify • Auto write back • Inactive drive spin down • Inactive drive spin down delay • Disk background scrub • Managed logs • Single controller mode • Auto stall recovery • Restart on CAPI fail • Large pools	Settings: • Enabled • 24 hours • Enabled • Low • Enabled • Disabled • 5 seconds • Disabled • Immediate • Disabled • Illegal request • Disabled • Enabled • Enabled • Disabled • Disabled • Disabled • Disabled • Enabled • Disabled • 15 minutes • Disabled • Disabled • Disabled (for a dual-controller system) • Enabled • Enabled • Disabled
FDE settings	(preserved)
Peer connections	(preserved)
Replication sets	(preserved)
Enclosure settings: • Name • Location • Rack number • Rack position	Settings: • (cleared) • (cleared) • 0 • 0

Table 145. Settings changed by restore defaults (continued)

Setting	Value
Host groups	(preserved)
iSCSI port settings: • IP • IP version • Netmask • Gateway • Router (IPv6 only)	Settings: • (preserved) • (preserved) • (preserved) • (preserved) • (preserved)
Other iSCSI settings: • CHAP enabled • iSNS • Jumbo frames	Settings: • (preserved) • (preserved) • (preserved)
CHAP records	(preserved)
Volume identifying information	(preserved)
Volume groups	(preserved)
Pool settings: • Thresholds • Overcommit • Limits and policy • Snapshot space thresholds	Settings: • (preserved) • (preserved) • (preserved) • (preserved)
Volume snapshot retention priority	(preserved)
Volume tier affinity	(preserved)
Volume cache settings	(preserved)
Expander fault isolation	(preserved)
Expander PHY settings	(preserved)
Device identification LED status	(preserved)
Debug log settings	Each parameter is reset to its default setting.