

Dell PowerVault ME5 Series Storage System

CLI Reference Guide

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 secure protocols HTTPS or SSH on a management host that is remotely connected through a LAN to a controller module network port. Using insecure protocols HTTP and Telnet is also supported but not recommended.
- Use a terminal emulator on a management host that is directly connected to a controller module management serial port.

For information about accessing the CLI and obtaining IP values for storage system management, see the *Dell PowerVault ME5 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: 2022-02-10 11:05:12
Time Zone Offset: -05:00

Success: Command completed successfully. (2022-02-10 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/<SHA256-hash>
```

NOTE: The SHA256 method is not compatible with LDAP user accounts. For LDAP, use HTTPS basic authentication instead.

- 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 [Using XML API output](#).

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 XML::LibXML;
use HTTP::Request::Common;
use IO::Socket::SSL qw( SSL_VERIFY_NONE );
# For SHA-256 Authentication
use Digest::SHA qw(sha256_hex);

use constant use_basic_auth => 1;

my $user = "manage";
my $password = "Abcd_1234";
my $ip = "YourIPAddress";

```

```

my $protocol = "https";

# Create a user agent for sending requests
my $user_agent = LWP::UserAgent->new();

# Skip certificate verification
$user_agent->ssl_opts(
    SSL_verify_mode => SSL_VERIFY_NONE,
    verify_hostname => 0
);

my $request;
if( use_basic_auth ) {
    # Login with HTTP basic authentication
    my $auth_url = "$protocol://$ip/api/login/";
    $request = HTTP::Request->new( GET=>$auth_url );
    $request->authorization_basic( $user, $password );
} else {
    # Login with SHA-256 hash
    my $auth_data = "$user\_ $password";
    my $sha256_hash = sha256_hex( $auth_data );
    my $auth_url = "$protocol://$ip/api/login/$sha256_hash";
    $request = HTTP::Request->new( GET => $auth_url );
}

# Request return data be XML format
$request->header( 'dataType'=>'ipa' );

# Make the request
$response = $user_agent->request( $request );

# Parse the returned XML and retrieve the returned 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;
    }
}

# Using the session key, request the system configuration
$url = "$protocol://$ip/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;

```

The last several lines of the Perl code above show how to get the entire configuration information from the CLI and print the output using the `ipa` option for XML output. The output can easily be redirected to a file for archiving. Alternatively, the `dataType` in the request header can be set to `json` for JSON output, or to `console` for standard CLI text output. Console output should not be used for parsing, but can be useful for tabular reports obtained directly from the CLI commands.

The following example shows how to construct a Python script to access the XML API via HTTPS.

```

import base64
import sys
import urllib.request
import xml.dom.minidom
import ssl

username = 'manage'
password = 'Abcd_1234'

```

```

# For the following, the protocol (HTTP or HTTPS) must be specified; for example,
# https://10.235.221.121
if sys.argv[1]:
    ip = sys.argv[1]
else:
    sys.exit(1)

temp_string = bytes(username + ':' + password, "utf-8")
encodedBytes = base64.b64encode(temp_string)
auth_string = str(encodedBytes, "utf-8")
print("Base64 = " + auth_string + "\n")

url = ip + '/api/login/'
req = urllib.request.Request(url)
req.add_header('Authorization', 'Basic ' + auth_string)

print(req.get_full_url())
print(req.get_header('Authorization'))

# Skip certificate verification
context = ssl.create_unverified_context()
response = urllib.request.urlopen(req, context=context)
xmlDoc = xml.dom.minidom.parseString(response.read())
loginObjs = xmlDoc.getElementsByTagName('OBJECT')
loginProps = xmlDoc.getElementsByTagName('PROPERTY')
sessionKey = ''

for lProp in loginProps:
    name = lProp.getAttribute('name')
    print("Property = " + name)
    if name == 'response':
        sessionKey = lProp.firstChild.data

print("Session Key = " + sessionKey + "\n" )

url = ip + '/api/show/disks'
req = urllib.request.Request(url)
req.add_header('sessionKey', sessionKey)
req.add_header('dataType', 'console')
response = urllib.request.urlopen(req, context=context)
print(response.read().decode('utf-8'))

```

The following example shows how to construct a Python script to communicate with the JSON API via HTTPS and return the response in JSON format.

```

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)

USE_BASIC_AUTH = 1
url = "https://<YourIPAddress>"
username = "manage"
password = "Abcd_1234"

if USE_BASIC_AUTH:
    # HTTP basic authentication
    headers = {'datatype': 'json'}
    r = requests.get(url + '/api/login', auth=(username, password), headers=headers,
verify=False)
else:
    # SHA-256 authentication
    auth_bytes = bytes(username + '_' + password, 'utf-8')
    auth_string = hashlib.sha256(auth_bytes).hexdigest()
    headers = {'datatype': 'json'}
    r = requests.get(url + '/api/login/' + auth_string, headers=headers, verify=False )

# Extract session key from response
response = json.loads(r.content.decode('utf-8'))

```

```

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.decode('utf-8'))
response = json.loads(r.content)
print("Health = " + response['system'][0]['health'])

```

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",
      "meta":"/meta/versions",
      "sc-cpu-type":"Broadwell 2200MHz",
      "bundle-version":"bundle-version",
      ...
    },
    {
      "object-name":"controller-b-versions",
      ...
    }
  ],
  "status":[
    {
      "object-name":"status",
      "meta":"/meta/status",
      "response-type":"Success",
      "response-type-numeric":0,
      "response":"Command completed successfully. (2020-01-29 10:34:38)",
      "return-code":0,
      "component-id":"",
      "time-stamp":"2020-01-29 10:34:38",
      "time-stamp-numeric":1580294078
    }
  ]
}
```

 **NOTE:** If the system has warnings or other messages to report, there can be more than one status object returned in this list, so the command status might not appear in the first element of the list.

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. (2020-01-29
10:58:27)</PROPERTY>
<PROPERTY name="return-code" type="sint32">0</PROPERTY>
<PROPERTY name="component-id" type="string"></PROPERTY>
<PROPERTY name="time-stamp" type="string">2020-01-29 10:58:27</PROPERTY>
<PROPERTY name="time-stamp-numeric" type="uint32">1580295507</PROPERTY>
</OBJECT>
```

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

```
"status": [
{
"object-name": "status",
"meta": "/meta/status",
"response-type": "Success",
"response-type-numeric": 0,
"response": "Command completed successfully. (2020-01-29 11:01:10)", "return-code": 0,
"component-id": "",
"time-stamp": "2020-01-29 11:01:10",
"time-stamp-numeric": 1580295670
}
]
```

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 may be:

- 0: The command completed successfully.
- -1000 to -1999: The command completed with a warning.
- Any other value: 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" REQUEST="create user JSmith interfaces wbi password
Abc#1379">
  <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. (JSmith) -
The new user was created. (2020-01-29 11:08:59)
    <PROPERTY name="return-code" type="sint32">0</PROPERTY>
    <PROPERTY name="component-id" type="string">JSmith</PROPERTY>
    <PROPERTY name="time-stamp" type="string">2020-01-29 11:08:59</PROPERTY>
    <PROPERTY name="time-stamp-numeric" type="uint32">1580296139</PROPERTY>
  </OBJECT>
</RESPONSE>
```

- JSON API output:

```
{
"status": [
{
"object-name": "status",
"meta": "/meta/status",
"response-type": "Success",
"response-type-numeric": 0,
"response": "Command completed successfully. (JSmith) - The new user was created.
(2020-01-29 11:05:40)",
"return-code": 0,

```

```

    "component-id":"JSmith",
    "time-stamp":"2020-01-29 11:05:40",
    "time-stamp-numeric":1580295940
  }
]
}

```

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_A1</PROPERTY>
<PROPERTY name="controller" key="true" type="string">A</PROPERTY>
<PROPERTY name="controller-numeric" key="true" type="uint32">1</PROPERTY>
<PROPERTY name="port" key="true" type="string">A1</PROPERTY>
...
<OBJECT basetype="fc-port" name="port-details" oid="2" format="rows">
<PROPERTY name="configured-topology" type="string">PTP</PROPERTY>
<PROPERTY name="configured-topology-numeric" type="uint32">1</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 keywords 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. The system uses UTF-8 which supports: 1 byte per character for English, Dutch, French, German, Italian, and Spanish; 3 bytes per character for Chinese, Japanese, and Korean. For example, a name that can contain 15 bytes can contain 15 characters in English or 5 characters in Chinese.

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 whose entirety matches the initial part of an optional parameter's keyword, you must specify the optional parameter before the keyword-less parameter.

For example, the `create user` command has an optional parameter with the keyword `base` and a name parameter with no keyword. To create a user named "base" or "bas" the `base` parameter must precede the name parameter. To create a user named "base1" or "ase" the parameters can be in any order.

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 \ 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

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.*`

Volume groups cannot be mapped.

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).

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.

Viewing help

See the topic for the `help` command.

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 c1` 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 redisplay 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
Move cursor right	Right Arrow
Delete previous character	Backspace
Delete previous, current, or next character (varies by terminal emulator)	Delete
Move the cursor to the start of the line	Home
Move the cursor to the end of the line	End

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](#). For entry of storage-space sizes, unless a base-2 or base-10 unit is specified, the unit is 512-byte blocks. If your base is set to 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.

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 ²	MB (megabyte)	1,000 ²
GiB (gibibyte)	1,024 ³	GB (gigabyte)	1,000 ³
TiB (tebibyte)	1,024 ⁴	TB (terabyte)	1,000 ⁴
PiB (pebibyte)	1,024 ⁵	PB (petabyte)	1,000 ⁵
EiB (exbibyte)	1,024 ⁶	EB (exabyte)	1,000 ⁶

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

Table 4. Decimal (radix) point character by locale (continued)

Language	Character	Examples
Dutch, French, German, Italian, 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.

Alerts

The alerts mechanism is a robust storage enclosure health and notification system designed to identify actionable conditions and promote best practices. Alerts enable you to monitor system health and performance issues and to track and acknowledge the resolution of these issues.

Each alert 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.

For information about viewing alerts, see the `show alerts` command.

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 delete user exit help meta set cli-parameters set password set prompt set user show cli-parameters show sessions show users whoami
LDAP and user groups	create user-group delete user-group set ldap-parameters set user-group show ldap-parameters show user-groups whoami
Disks, disk groups, pools, tiers, and spares	abort scrub add disk-group add spares clear disk-metadata delete pools dequarantine erase disk expand disk-group remove disk-groups remove spares rescan scrub disk-groups

Table 5. Commands by category (continued)

Category	Commands
	set disk-group set pool show disk-groups show disks show pools show tiers trust
Full disk encryption	clear fde-keys set disk set fde-import-key set fde-lock-key set fde-state show fde-state
Volumes, initiators, hosts, and mapping	create volume create volume-set delete initiator-nickname delete volumes expand volume map volume release volume set initiator set volume show initiators show maps show ports show unwritable-cache show volume-names show volume-reservations show volumes unmap volume
Volume groups	add volume-group-members create volume-group delete volume-groups remove volume-group-members set volume-group show volume-groups
Host groups	add host-group-members add host-members create host

Table 5. Commands by category (continued)

Category	Commands
	create host-group delete host-groups delete hosts remove host-group-members remove host-members set host set host-group show host-groups
Snapshots, volume copy, and rollback	abort copy copy volume create snapshots delete all-snapshots delete snapshot reset snapshot rollback volume set snapshot-space show snapshot-space show snapshots show volume-copies
Scheduled tasks	create schedule create task delete schedule delete task set schedule set task show schedules show tasks
Notifications (alerts and events)	clear alerts set alert set email-parameters set snmp-parameters set syslog-parameters show alert-condition-history show alerts show email-parameters show events show snmp-parameters show syslog-parameters test

Table 5. Commands by category (continued)

Category	Commands
System configuration and utilities	activate certificate activate firmware add ipv6-address check firmware-upgrade-health clear cache clear dns-parameters create certificate create certificate-signing-request create chap-record delete chap-records ping remove certificate remove ipv6-address reset dns-management-hostname reset host-link restart mc restart sc set advanced-settings set chap-record set controller-date set disk-parameters set dns-management-hostname set dns-parameters set enclosure set host-parameters set ipv6-network-parameters set iscsi-parameters set network-parameters set ntp-parameters set protocols set system set volume-cache-parameters show advanced-settings show audit-log show cache-parameters show certificate show certificates show chap-records show configuration show controller-date show controllers

Table 5. Commands by category (continued)

Category	Commands
	show disk-parameters show dns-management-hostname show dns-parameters show enclosures show expander-status show fan-modules show fans show firmware-bundles show firmware-update-status show frus show inquiry show ipv6-addresses show ipv6-network-parameters show iscsi-parameters show license show network-parameters show ntp-status show power-supplies show protocols show provisioning show redundancy-mode show sas-link-health show sensor-status show shutdown-status show system show system-parameters show versions show workload shutdown
Service utilities	clear events clear expander-status restore defaults set led show service-tag-info
API specific	meta
Remote systems	create remote-system delete remote-system remote set remote-system show remote-systems

Table 5. Commands by category (continued)

Category	Commands
Peer connections and replication	abort replication clear replication-queue create peer-connection create replication-set delete peer-connection delete replication-set query peer-connection recover replication-set replicate resume replication-set set peer-connection set replication-set show peer-connections show replication-sets show replication-snapshot-history suspend replication-set
Statistics	reset all-statistics reset controller-statistics reset disk-error-statistics reset disk-group-statistics reset disk-statistics reset host-port-statistics reset pool-statistics reset volume-statistics show controller-statistics show disk-group-statistics show disk-statistics show host-phy-statistics show host-port-statistics show pool-statistics show tier-statistics show volume-statistics
Metrics	query metrics show metrics-list start metrics stop metrics
SupportAssist	check support-assist-connection check support-assist-updates send support-assist-logs

Table 5. Commands by category (continued)

Category	Commands
	set support-assist set support-assist-authentication set support-assist-connection set support-assist-contact set support-assist-proxy show support-assist show support-assist-contact show support-assist-telemetry-status
Security	reset ciphers set ciphers show ciphers

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 purpose and notes about its usage
- **Minimum role**—The minimum user role required to use the command
- **Syntax**—The command syntax
- **Parameters**—Descriptions of the command parameters
- **Output**—Descriptions of fields shown in console format
- **Examples**—One or more examples of the command 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	standard
Syntax	<code>abort copy</code> <code><volume-ID></code>
Parameters	<code><volume-ID></code> 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 <i>SourceVol</i> to volume <i>DestVol</i> . <code># abort copy SourceVol</code>
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 <i>Running</i> or <i>Suspended</i>. Attempting to abort replication for a replication set whose state is either <i>Ready</i> or <i>Unsynchronized</i> fails with an error message. If you abort a running replication, the replication set returns to the state it had before replication started—either <i>Ready</i> or <i>Unsynchronized</i>. If you abort a suspended replication, the replication set state remains <i>Suspended</i>, and the aborted replication <i>Run Error</i> property shows the replication has

	been suspended, even though the replication has actually been aborted and therefore cannot be resumed. 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	standard <i>replication-set</i>
Syntax	<pre>abort replication <replication-set></pre>
Parameters	<pre><replication-set></pre> The name or serial number of the replication set in which to abort replications.
Examples	Abort active replications in replication set <i>RS1</i> <pre># abort replication RS1</pre>
See also	replicate resume replication-set show replication-sets suspend replication-set

abort scrub

Description	Aborts a media scrub operation.
Minimum role	standard
Syntax	<pre>abort scrub [disk-group <disk-groups>] [volume <volumes>]</pre>
Parameters	Specify only one of the following parameters. <pre>disk-group <disk-groups></pre> 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. <pre>volume <volumes></pre> 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 <i>dg1</i> <pre># abort scrub disk-group dg1</pre> Abort scrubbing volume <i>vol1</i>. <pre># abort scrub volumevol1</pre>
See also	scrub disk-groups scrub volume show disk-groups show volumes

activate certificate

Description	Makes a previously added certificate active for a specific service. Certificates are specified by name. Run the show certificates command to list all certificates and view certificate names.  NOTE: A valid trust chain of certificates must be present on the controller before activating a certificate. That is, a trusted root certificate must be present, linking any intermediate certificates. To determine if a root certificate is present, run show certificates with the truststore parameter.  NOTE: Certificates must be uploaded to the storage system before you can activate them. Certificates must be uploaded by using the API.
Minimum role	manage
Syntax	<pre>activate certificate service web ldap <name></pre>
Parameters	<pre>service web ldap</pre> The service that the certificate is applied to. <name> The name of the certificate to activate. Run the show certificates command to list all certificates, where you can view certificate names.
Examples	Activate a certificate named CERT_A_12345 for the web service. <pre># activate certificate CERT_A_12345 service web</pre>
See also	create certificate-signing-request remove certificate show certificate show certificates

activate firmware

Description	Updates the firmware bundle stored inside the controller.
Minimum role	manage
Syntax	<pre>activate firmware bundle active available</pre>
Parameters	<pre>bundle active available</pre> • active: Allows a user to re-activate the currently active firmware to retry a firmware update. • available: Activates firmware that has been uploaded to the system.
Examples	Activate a firmware bundle that has been uploaded to the system. <pre># activate firmware bundle available</pre>
See also	show firmware-bundles

show firmware-update-status
check firmware-upgrade-health
show versions

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). 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 (with the Performance tier license). - As an all-flash array (without the Performance Tier license). - 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 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 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	standard
Syntax	<pre>add disk-group [assigned-to a b auto] [chunk-size 64k 128k 256k 512k] [interleaved-basename <name>] [interleaved-volume-count <value>] disks disks [level nraid raid0 r0 raid1 r1 raid5 r5 raid6 r6 raid10 r10 ADAPT] [mode online offline] [pool a b] [spare <disks>] [spare-capacity <size>[B KB MB GB TB KiB MiB GiB TiB] default] [stripe-width 8+2 16+2] type linear virtual read-cache</pre>

	[<name>]
Parameters	<code>assigned-to a b auto</code> 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 <code>auto</code> 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. <code>chunk-size 64k 128k 256k 512k</code> 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, <code>chunk-size</code> has no meaning and is therefore not applicable. 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. <code>disks <disks></code> 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 5: 3-16 RAID 6: 4-16 RAID 10: 4-16 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. RAID 10 requires a minimum of two RAID 1 subgroups each having two disks. The system automatically uses NRAID for a read-cache disk group with a single disk, or RAID 0 for a read-cache disk group with multiple disks. NOTE: RAID 5 and RAID 6 disk groups, which have parity disks, should be created using the "power of 2" method to align properly with virtual pages. Failure to follow this method can result in significant degradation of sequential write performance. RAID 5 disk groups should be created using 3, 5, or 9 disks. RAID 6 disk groups should be created using 4, 6, or 10 disks. <code>interleaved-basename <name></code> Optional. When specifying <code>interleaved-volume-count</code>, a name can be chosen for the volumes that will be created. 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 interleaved-basename `pDG_v`, if `pDG_v0000` and `pDG_v0002` exist, the next volumes created will be `pDG_v0001` and `pDG_v0003`. If a basename is not provided when specifying `interleaved-volume-count`, the name defaults to `vol.interleaved-volume-count <value>`. Optional. The number of volumes to create, from 1 to 128. An ADAPT disk group can be optimized by predetermining the number of interleaved volumes in a disk group. The volumes will be created as part of adding the disk group. Available space is distributed evenly among the volumes. Volumes created by using this parameter are not mapped. If any of the volumes fails to be created, disk group creation fails; the disk group and all volumes are deleted.

i NOTE: Interleaved volumes cannot be expanded, and you cannot remove an interleaved volume. To remove interleaved volumes, you must remove the entire disk group.

`level nraid|raid0|r0|raid1|r1|raid5|r5|raid6|r6|raid10|r10|ADAPT`

Required for a linear disk group. Required for a virtual disk 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 state is 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 default for 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 from 1 to 4 dedicated spares to assign to a RAID 1, 5, 6, or 10 disk group. For disk syntax, see [Command syntax](#). Only global spares are used for virtual disk groups.

`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.

`stripe-width 8+2|16+2`

Optional. For an ADAPT disk group, this specifies the stripe width to use.

- **8+2:** Each stripe contains 8 data chunks and 2 parity chunks. Including spare capacity equivalent to the 2 largest disks, the minimum disk-group size is 12 disks. This is the default.
- **16+2:** Each stripe contains 16 data chunks and 2 parity chunks. Including spare capacity equivalent to the 2 largest disks, the minimum disk-group size is 20 disks. This option has less overhead, but also less redundancy, than the 8+2 option.

`type linear|virtual|read-cache`

Required. Specifies the type of disk group to create.

	• <code>linear</code> : A disk group for linear storage. • <code>virtual</code> : A standard disk group for virtual storage. • <code>read-cache</code> : 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 <code>dgcontroller-ID#</code> where # starts at 01 for a virtual disk group, or <code>rccontroller-ID</code> for a read-cache disk group.
Examples	Add linear RAID-1 disk group dg1 with one spare. <pre># add disk-group type linear disks 1.20-21 level r1 spare 1.22 dg1</pre> Add ADAPT linear disk group ALDG. <pre># add disk-group type linear disks 1.1-12 level adapt ALDG</pre> Add ADAPT linear disk group ALDG with 7 optimally sized volumes (interleaved) and 1 drive spare capacity. The volume basename is myVol. <pre># add disk-group type linear disks 0.0-48 level ADAPT spare-capacity 16TB interleavedvolume-count 7 interleaved-basename myVol ALDG</pre> Add a virtual RAID-6 disk group to pool A. The resulting group will have an auto-generated name. <pre># add disk-group type virtual disks 1.16-19 level r6 pool a</pre> Add an ADAPT virtual disk group to pool B. <pre># add disk-group type virtual disks 2.1-12 level adapt pool b</pre> Add a read-cache disk group to pool B. The resulting group will be named rcB. <pre># add disk-group type read-cache disks 1.18-19 pool b</pre>
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 128 initiators. A host group can contain from 1 to 256 hosts as long as the sum of all initiators in all hosts in the host group does not exceed 128. 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	standard
Syntax	<pre>add host-group-members hosts <hosts> host-group</pre>
Parameters	<pre>hosts <hosts></pre>

	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. <host-group> The name of an existing host group.
Examples	Add existing hosts <code>Host3</code> and <code>Host4</code> to existing host group <code>HostGroup1</code>. <pre># add host-group-members hosts Host3,Host4 HostGroup1</pre>
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	standard
Syntax	<pre>add host-members initiators <initiators> <host-name></pre>
Parameters	<code>initiators <initiators></code> 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. <host-name> The name of an existing host.
Examples	Add existing initiators <code>Init3</code> and <code>Init4</code> to existing host <code>Host1</code>. <pre># add host-members initiators Init3,Init4 Host1</pre>
See also	create host remove host-group-members show host-groups (and hosts) 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 <code>autoconfig</code> parameter is disabled. All addresses added to the IPv6 address list should be reachable if <code>autoconfig</code> is disabled. They are ignored if <code>autoconfig</code> 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	standard
Syntax	<code>add ipv6-address</code>

	<pre>[address-label <name>] [controller a b] ip-address <IP-address> [prefix-length <value>]</pre>
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 within the scope of each controller. For example, controller A can have only one address labeled <code>vlan1</code>, and controller B can also have only one address labeled <code>vlan1</code>. 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 <code>/prefixLength 1-128</code> notation; or the <code>prefixLength</code> may be omitted if the <code>prefix-length</code> 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 <code>ip-parameter</code> value does not include <code>/prefixLength</code> notation.
Examples	Add an IPv6 address named <code>vlan1</code> to the network port in controller A only. <pre># addipv6-address controller a address-label vlan1ip-address 2620:0:350:fc02:2c0:ffff:fe28:8787/64</pre>
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. For virtual storage, all spares are global spares. For linear storage, you can add global spares or dedicated spares. A global spare can replace a failed disk of the same type (enterprise SAS, for example) and the same or lower capacity in any disk group with a fault-tolerant RAID level other than ADAPT. 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 can replace a failed disk of the same type (enterprise SAS, for example) and the same or lower capacity in a specific disk group with a fault-tolerant RAID level other than ADAPT. A linear disk group can have 4 dedicated spares. If the disks in the system are FDE-capable, spares must also be FDE-capable. For information about sparing rules, see the spares topic in the Administrator's Guide.

	i 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).
Minimum role	standard
Syntax	<pre>add spares [disk-group <disk-group>] disks</pre>
Parameters	<code>disk-group <disk-group></code> 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. <code><disks></code> The IDs of the disks to designate as spares. For disk syntax, see Command syntax.
Examples	Designate disk 1.2 as a global spare. <pre># add spares 1.2</pre> Designate disk 1.3 as a dedicated spare for linear disk group dg1 <pre># add spares disk-group dg1 1.3</pre>
See also	remove spares show disk-groups show disks

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	standard
Syntax	<pre>add storage [enclosure <enclosure-IDs>] [preview]</pre>
Parameters	<code>enclosure <enclosure-IDs></code> Optional. Limits provisioning to a specified enclosure. If this parameter is omitted, the command uses disks from all enclosures. <code>preview</code> Optional. Toggles between adding storage and displaying a possible storage configuration.
Examples	Add storage to the system. <pre># add storage</pre>

	Add storage to a single enclosure. <pre># add storage enclosure 3</pre> Preview a storage configuration which could be added. <pre># add storage preview</pre>
Basetypes	adapt-expand-preview disk-groups-preview spares-preview storage-preview unused-disks-preview status
See also	add disk-group add spares show disks show disk-groups show pools

add volume-group-members

Description	Adds volumes to a volume group. This command applies to virtual storage only. To add a volume to a volume group, the volume must be in the same pool. You cannot add a volume to a volume group that is in a replication set. Volume groups cannot be mapped.
Minimum role	standard
Syntax	<pre>add volume-group-members volumes <volumes> <volume-group></pre>
Parameters	<code>volumes <volumes></code> A comma-separated list of the names or serial numbers of volumes to add to the specified volume group. A name that includes a space must be enclosed in double quotes. <code><volume-group></code> 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. <pre># add volume-group-members volumes Vol0002,Vol0003 VolumeGroup1</pre>
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 Administrator's Guide.
Minimum role	standard
Syntax	<code>check firmware-upgrade-health</code>
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. <pre># check firmware-upgrade-health Upgrade Health ----- Pass -----</pre> Check firmware upgrade health for a system that has problems to be resolved before upgrade. <pre># check firmware-upgrade-health Upgrade Health ----- Fail Condition Detected Risks ----- One or more disks are currently single ported. Data unavailability At least one controller is not up. Data unavailability At least one controller contains unwritten cache data. Data corruption, data loss One or more fans are not functioning. Code load failure One or more disk groups are in a quarantined state. Code load failure</pre>
Basetypes	code-load-readiness code-load-readiness-reason status
See also	show controllers

	show disk-groups show disks show enclosures show fans show firmware-update-status show power-supplies show sensor-status show system

check support-assist-connection

Description	Performs a connectivity test to the SupportAssist server based on the selected connection mode. NOTE: This command performs a connectivity test only, which attempts to determine if a connection could be made with the given parameters. You can run this command even if SupportAssist is currently disabled.
Minimum role	standard
Syntax	<pre>check support-assist-connection mode direct gateway [proxy true false] [uri <URL>]</pre>
Parameters	mode direct gateway - direct: Performs connectivity tests to Dell support servers. - gateway: Performs connectivity tests to all the user-configured gateway servers. proxy true false Optional. Determines whether the connectivity test is performed via a configured proxy server. - true: Performs connectivity test via the proxy server. - false: No proxy is used. uri <URL> Optional. The URL of a specific endpoint for which to check connectivity.
Output	Connection State - Connected: For direct mode, indicates the connectivity test to at least one Dell support server succeeded. For gateway mode, indicates the connectivity test to at least one gateway server succeeded. - Not Connected: For direct mode, indicates that none of the connectivity tests to Dell support servers succeeded. For gateway mode, indicates that none of the connectivity tests to the gateway servers succeeded. NOTE: This value indicates the result of the connectivity test based on the mode you specify. The mode is not related to your preferred connection method, which you set with the <code>set support-assist-connection</code> command. Use the <code>show support-assist</code> command and check the Connection Preference value to verify which connection mode preference is set. Endpoint The following properties are displayed once for each endpoint in the response. - Mode: direct or gateway.

	• Endpoint: The URL for which the connection is verified. • Status: success, fail, or disabled. • HTTP Status: The HTTP response code (e.g., 200 for success, 400 for failure). • Message: The message that corresponds with the <code>HTTP Status</code> (e.g., OK for 200). • Status Detail: Provides additional information about the status. The following values are possible: ◦ Success ◦ Disabled ◦ Failed ◦ TimedOut ◦ ConnectionError ◦ SSLError ◦ • Proxy Type: Indicates the authentication with proxy. The following values are possible: ◦ <code>httpAnonymous</code>: Proxy is used but proxy username is null or empty. ◦ <code>httpUsernameOnly</code>: Proxy is used, proxy username is set, but proxy password is null or empty. ◦ <code>httpUsernamePassword</code>: Proxy is used, and the proxy username and password are set. ◦ <code>invalidProxyConfig</code>: Proxy is used, but the proxy URI is invalid, null, or empty. ◦ <code>none</code>: Proxy is not used. ProxyError
Examples	Return connectivity test results for direct connectivity to Dell support servers. <pre># check support-assist-connection mode direct</pre> Return connectivity test results for connectivity to a specified gateway URI without using a proxy. <pre># check support-assist-connection mode gateway uri https://<address> proxy false</pre>
Basetypes	endpoints-status support-assist-conn status
See also	check support-assist-updates send support-assist-logs set support-assist set support-assist-authentication set support-assist-connection set support-assist-contact set support-assist-proxy show support-assist show support-assist-contact show support-assist-telemetry-status

check support-assist-updates

Description	Shows firmware update packages that are available for this storage system.
Minimum role	monitor
Syntax	<code>check support-assist-updates</code>

Output	Firmware Update The following information is repeated for each available firmware bundle. • Current Revision • Release Version • Release Date • Criticality • SHA256 Checksum • File Size • File Link • Release Notes Link • Description Disk Update The list of information above is repeated for any available disk updates.
Examples	Check for available firmware update packages. <pre># check support-assist-updates</pre>
Basetypes	ch-firmware-updates status
See also	check support-assist-connection send support-assist-logs set support-assist set support-assist-authentication set support-assist-connection set support-assist-contact set support-assist-proxy show support-assist show support-assist-contact show support-assist-telemetry-status

clear alerts

Description	Clears all the alerts from the active list, and forces a fresh analysis of the system for any active alert conditions. For alert conditions that have not yet been resolved, new alerts are reported in an unacknowledged state. Any previously acknowledged alerts that are unresolved must be re-acknowledged.
Minimum role	standard
Syntax	<code>clear alerts</code>
Examples	Clear all alerts for the system. <pre># clear alerts</pre>
See also	set alert show alert-condition-history show alerts

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 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 unrecoverable data loss. You can clear unwritable cache data for a specified volume or for all volumes
Minimum role	standard
Syntax	<pre>clear cache</pre> <pre>[volume <volume>]</pre>
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. <pre># clear cache volume v1</pre>
See also	show unwritable-cache show volumes

clear disk-metadata

Description	Clears metadata from leftover disks. For a leftover disk, the <code>show disks</code> command shows the Usage value <code>LEFTOVR</code>.  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 <i>leftover</i>: • Disk group member 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 health status becomes <code>Degraded</code> and its <code>How Used</code> state becomes <code>LEFTOVR</code> • The disk is automatically excluded from the disk group, causing the disk group health status to become <code>Degraded</code> or <code>Fault</code>, depending on the RAID level. If spares are available, and the health of the disk group is <code>Degraded</code>, the disk group will use spares to start reconstruction. When reconstruction is complete, you can clear the metadata on the leftover disk. Clearing the metadata will change the disk health status to <code>OK</code> and its <code>How Used</code> state to <code>AVAIL</code>, 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 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	standard
Syntax	<pre>clear disk-metadata</pre> <pre><disks></pre>  CAUTION: Contact technical support before clearing metadata from a disk that is a member of an offline or quarantined disk group, which could result in unrecoverable data loss. Recovery of an offline disk group must be done with help from technical support before metadata is cleared.
Parameters	<pre><disks></pre> 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. <pre># clear disk-metadata 1.1</pre>
See also	show disks

clear dns-parameters

Description	Clears configured DNS settings for each controller module.
Minimum role	standard
Syntax	<pre>clear dns-parameters</pre> <pre>[controller a b both]</pre>
Parameters	<pre>controller a b both</pre> 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. <pre># clear dns-parameters controller a</pre>
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.  NOTE: This command is for use by or with direction from technical support.
Minimum role	standard
Syntax	<pre>clear events</pre> <pre>[a b both]</pre> <pre>[noprompt]</pre>

Parameters	[a b both] Optional. The controller event log to clear. If this parameter is omitted, both event logs are cleared. noprompt Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.
Examples	Clear the event log for controller A. <pre># clear events a</pre>
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	standard
Syntax	<pre>clear expander-status</pre> <pre>[<enclosure ID>]</pre>
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. <pre># clear expander-status enclosure 1</pre>
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	standard
Syntax	<pre>clear fde-keys</pre> <pre>[current-passphrase <value>]</pre>
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 to secure the data in this system. After the system is power cycled, the disks will be locked. # clear fde-keys current-passphrase myPassphrase
See also	set fde-lock-key set fde-state show fde-state

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 queue policy is <code>Queue Latest</code> , 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	standard
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

copy volume

Description	Copies all data in a specified source volume to a destination volume. This command applies to virtual storage only. 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: • Delete the snapshot base volume without losing the data in the snapshot. • Set a different tier preference for a snapshot than for its parent (or for another snapshot in the same tree).

	- Exclude volume data from the overall pool snapshot space (because it might cause deletion of other snapshots). - The volume snapshot tree is full and no more snapshots can be taken, but you want to retain the snapshots. - The volume 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 delete the volume if no longer needed. Creating the copy of the volume may not exceed the high threshold of the virtual pool. 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	standard
Syntax	<pre>copy volume [destination-pool <destination-pool-ID>] name <destination-volume-name> <source-volume-ID></pre>
Parameters	<code>destination-pool <destination-pool-ID></code> 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. <code>name <destination-volume-name></code> 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. <code><source-volume-ID></code> 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. <pre># copy volume SourceVol destination-pool B name DestVol</pre>
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. After using this command you must restart each Management Controller to which the change is applied to have the change take effect
Minimum role	standard
Syntax	<pre>create certificate [a b both] [contents <content-string>] [noprompt] [restore] [unique]</pre>
Parameters	<code>a b both</code> 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. <code>contents <content-string></code> 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 <code>/type0=value0/type1=value1/type2=...</code>, 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 <code>/C=US/ST=CO/O=MyOrganization/CN=www.mysite.com</code>. You must specify either this parameter or the <code>restore</code> parameter or the <code>unique</code> parameter. <code>noprompt</code> Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction. <code>restore</code> 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 <code>contents</code> parameter or the <code>unique</code> parameter. <code>unique</code> 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 <code>contents</code> parameter or the <code>restore</code> parameter.
Examples	Regenerate the system certificate with a new private key. <pre># create certificate unique</pre> Create a custom certificate using a content string. <pre># create certificate contents /C=US/ST=CO/L=NewYork/O=MyCompany/CN=www.mycompany.com</pre> Restore the system-generated certificate and remove the custom certificate. <pre># create certificate restore</pre>
See also	restart mc

	restart sc show certificate

create certificate-signing-request

Description	Creates a new certificate signing request 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. This command allows creation of a certificate signing request to generate a new certificate. After using this command to restore the default certificate you must restart each Management Controller to which the change is applied to have the change take effect.
Minimum role	standard
Syntax	<pre>create certificate-signing-request [a b both] [subject <content-string>] [noprompt] [restore] [extension <extension-string>]</pre>
Parameters	<code>a b both</code> 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. <code>subject <content-string></code> 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 <code>/type0=value0/type1=value1/type2=...</code>, where types include Cf or 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 <code>/C=US/ST=CO/O=MyOrganization/CN=www.mysite.com</code>. You must specify either this parameter or the <code>restore</code> parameter. <code>noprompt</code> Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction. <code>restore</code> 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 <code>subject</code> parameter. <code>extension</code> Optional. This field adds extension parameters to the CSR if requested by the user. The extension string cannot exceed 1024 characters and can include printable UTF-8 characters except space or semicolon. An example is <code>/basicConstraints=CA:FALSE/extendedKeyUsage=clientAuth,serverAuth</code>.
Examples	Create a custom certificate signing request using a subject string. <pre># create certificate-signing-request subject /C=US/ST=CO/L=NewYork/ O=MyCompany/CN=www.mycompany.com</pre>

	Restore the system-generated certificate and remove the custom certificate. <pre># create certificate-signing-request restore</pre>
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 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	standard
Syntax	<pre>create chap-record name <originator-name> secret <originator-secret> [mutual-name <recipient-name> mutual-secret <recipient-secret>]</pre>
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 the IQN of a storage system, 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 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 <code>create host</code> 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	standard
Syntax	<pre>create host [host-group <host-group>] [initiators <initiators>] [profile standard hp-ux openvms] <name></pre>
Parameters	<code>host-group <host-group></code> Optional. The name of an existing host group to which to add the new host. <code>initiators <initiators></code> 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. <code>profile standard hp-ux openvms</code> Optional. <code>standard</code>: Default profile. <code>hp-ux</code>: The host uses Flat Space Addressing. <code>openvms</code>: The host does not allow LUN 0 to be assigned to a mapping. <code><name></code> 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 <code>Host1</code> that includes two FC initiators <pre># create host initiators 10000090fa13870e,10000090fa13870f Host1</pre> Create host <code>Host2</code> that includes two iSCSI initiators. <pre># create host initiators iqn.1992-01.com.example:storage.host2.port1, iqn.1992-01.com.example:storage.host2.port2 Host2</pre>

	Create host <code>Host4</code> 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	standard
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 <code>HostGroup1</code> that includes hosts <code>Host1</code> and <code>Host2</code> . # 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. This command applies to virtual storage only. 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 be licensed to use virtual replication. • 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	standard
Syntax	<pre>create peer-connection [remote-password <password>] remote-port-address <remote-port-address> remote-username <username> <name></pre>
Parameters	<pre>remote-password <password></pre> Optional in console mode; required for API mode. 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. <pre>remote-port-address <remote-port-address></pre> Specifies the FC WWN or iSCSI IP address of the remote system with which to create a peer connection. IPv4 and IPv6 formats are supported. <pre>remote-username <username></pre> 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. <pre><name></pre> 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. <pre># create peer-connection remote-port-address 192.168.200.22 remote-username John remote-password P@ssw0rd Peer1</pre> 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. <pre># create peer-connection remote-port-address 247000c0ff1a45b8 remote-username Admin1 Peer2 Enter remote password: ***** Re-enter remote password: *****</pre>

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

create remote-system

Description	Creates a persistent association with a remote storage system. This allows a local system to track remote systems by their network-port IP addresses and cache their login credentials. The IP address you specify is used to connect to the remote system and obtain information such as the system name and both controllers' IP addresses. You can then use the system name or an IP address in commands that need to interact with the remote system.
Minimum role	standard
Syntax	<pre>create remote-system password <password> username <username> <IP-address></pre>
Parameters	<code>password <password></code> The password of the user specified by the <code>username</code> parameter. <code>username <username></code> The name of a user in the remote system. This must be a user having the standard or manage role to remotely configure or provision that system. <code><IP-address></code> The network-port IP address of the remote system. The value can be an IPv4 address, IPv6 address, or FQDN.
Examples	Create a remote system with username JDoe, password Abcd_1234, and IP address 10.122.1.21. <pre># create remote-system username JDoe password Abcd_1234 10.122.1.21</pre>
See also	delete remote-system remote set remote-system show remote-systems

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. A maximum of 1 replication set per volume can be created. This command designates the specified source volume or volume group as the primary volume or volume group, creates the secondary volume or volume group, and creates the internal snapshots 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 <code>discard</code>, or three each if the queue policy is set to <code>queue-latest</code>.

- 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	<pre>create replication-set peer-connection <peer-connection-ID> primary-volume <volume-ID> <volume-group-ID> [queue-policy discard queue-latest]</pre>

	<pre>[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</pre>
Parameters	<pre>peer-connection <peer-connection-ID></pre> Specifies the name or serial number of the peer connection on which to create the replication set <pre>primary-volume <volume-ID> <volume-group-ID></pre> 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. <pre>queue-policy discard queue-latest</pre> Optional. Specifies the action to take when a replication is running and a new replication is requested. • <code>discard</code>: Discard the new replication request. • <code>queue-latest</code>: 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 <code>queue-latest</code> and a replication is running and another is queued, you cannot change the queue policy to <code>discard</code>. The queued replication must be manually removed before you can change the policy. <pre>secondary-pool A B</pre> 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. <pre>secondary-volume-name <name></pre> 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. <pre>snapshot-basename <basename></pre> Optional if <code>snapshot-history</code> is set to <code>disabled</code> or <code>off</code>. Required if <code>snapshot-history</code> is set to <code>secondary</code> or <code>both</code>. Specifies a prefix to help you identify replication snapshots. Input rules: • The value is case sensitive. • The value can have 1 to 24 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. <pre>snapshot-count <#></pre> 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. If not specified, the snapshot count defaults to 1 during command execution with <code>snapshot-history</code> enabled. 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 <code>snapshot-history</code> is enabled.

	<code>snapshot-history disabled off secondary both</code> Optional. Specifies whether to maintain a replication snapshot history for the replication set, as previously described. • <code>disabled</code> or <code>off</code>: 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. • <code>secondary</code>: A snapshot history set is kept on the secondary system for the secondary volume, using <code>snapshot-count</code> and <code>snapshot-basename</code> settings. • <code>both</code>: 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 <code>snapshot-count</code> and <code>snapshot-basename</code> settings <code>snapshot-retention-priority never-delete high medium low</code> 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. • <code>never-delete</code>: 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. • <code>high</code>: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted. • <code>medium</code>: Snapshots can be deleted after all eligible low-priority snapshots have been deleted. • <code>low</code>: 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. <pre># create replication-set peer-connection Peer1 primary-volume Vol1 RS1</pre> Create replication set RS1 for volume group VG1.* on the peer connection Peer1. <pre># create replication-set peer-connection Peer1 primary-volume VG1.* RS1</pre> 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. <pre># 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</pre>
See also	delete replication-set recover replication-set replicate 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	standard
Syntax	<pre>create schedule schedule-specification "<specification>" task-name <task-name> <schedule-name></pre>
Parameters	<code>schedule-specification "<specification>"</code> 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 <code>AM</code> or <code>PM</code> is not specified, a 24-hour clock is used. <code>start <yyyy-mm-dd hh>:<mm>[AM PM]</code> 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. <code>[every <#> minutes hours days weeks months years]</code> Specifies the interval at which the task runs. For better performance when scheduling a <code>TakeSnapshot</code> 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 <code>Replicate</code> task, the minimum interval is 30 minutes <code>[between <hh:mm> [AM PM] and <hh>:<mm>[AM PM]]</code> Constrains the time range during which the task is permitted to run. Ensure that the start time is within the specified time range. <code>[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]</code> Constrains the days or months when the task is permitted to run. Ensure that this constraint includes the start date. <code>[count <#>]</code> Constrains the number of times the task is permitted to run. <code>[expires <yyyy-mm-dd hh>:<mm>[AM PM]]</code> Specifies when the schedule expires, after which the task no longer runs. <code>task-name <task-name></code> 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. <code>schedule-name</code> 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: <code>"</code>, <code><</code>, <code>\</code> - 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. <pre># 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</pre> 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. <pre># create schedule schedule-specification "start 2019-03-01 00:01 only first weekday of month" task-name Task2 Sched2</pre>
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	standard
Syntax	<pre>create snapshots volumes <volumes> <snap-names></pre>
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. <pre># create snapshots volumes V4,V5 V4snap,V5snap</pre>
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 name and other volume characteristics are not changed. • Replicate a virtual replication set primary volume or volume group to a peer system  CAUTION: Before scheduling a <code>ResetSnapshot</code> 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	standard
Syntax	To create a task to take a snapshot: <pre>create task retention-count <#> snapshot-prefix <prefix> source-volume <volume> type TakeSnapshot name</pre> To create a task to reset a snapshot: <pre>create task snapshot-volume <volume> type ResetSnapshot <name></pre> To create a task to replicate a virtual volume: <pre>create task [last-snapshot] replication-set <replication-set-ID> type Replicate <name></pre> To create a task to enable spin down: <pre>create task type EnableDSD <name></pre> To create a task to disable spin down: <pre>create task type DisableDSD <name></pre>
Parameters	<code>last-snapshot</code> Optional. For a <code>Replicate</code> task this specifies to replicate the most recent snapshot of the primary volume in a single-volume replication set. At the time the scheduled replication occurs, the snapshot must exist. This snapshot may have been created either manually or by scheduling the snapshot. This option cannot be used for a replication set that contains a volume group. <code>replication-set <replication-set-ID></code>

	For a Replicate task this specifies the ID of the replication set to replicate. <pre>retention-count #</pre> For a TakeSnapshot task this specifies the number of snapshots created by this task to retain, from 1 to 16. When a new snapshot exceeds this limit, the oldest snapshot is reset and renamed with the same prefix. The oldest snapshot is the one whose name has the lowest number (such as 01 as compared with 02). Resetting the oldest snapshot does not change its creation date/time. <pre>snapshot-prefix <prefix></pre> 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. <pre>snapshot-volume <volume></pre> 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. <pre>source-volume <volume></pre> 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. <pre>type TakeSnapshot ResetSnapshot Replicate EnableDSD DisableDSD</pre> The task type: • TakeSnapshot: Creates a snapshot. • ResetSnapshot: Resets the data in a snapshot. • Replicate: Replicates a virtual replication set primary volume or volume group to a peer system. • EnableDSD: Enables drive spin down. • DisableDSD: Disables drive spin down. • <i>name</i> 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 V1 and retains only the latest four snapshots with the prefix V1 (for example, V1_S0001). <pre># create task type TakeSnapshot source-volume V1 snapshot-prefix V1 retention-count 4 Snap</pre> Create task Reset that resets snapshot V1_S0001. <pre># create task type ResetSnapshot snapshot-volume V1_S0001 Reset</pre> Create task replicaterS1 that replicates virtual replication set RS1 primary volume or volume group. <pre># create task type Replicate replication-set RS1 replicaterS1</pre> Create task replicaterS2 that replicates the newest snapshot of virtual replication set RS2 primary volume or volume group <pre># create task type Replicate replication-set RS2 replicaterS2 last-snapshot</pre> Create task taskDSDresume to enable or resume spin down. <pre># create task type EnableDSD taskDSDresume</pre> Create task taskDSDsuspend to disable or suspend spin down. <pre># create task type DisableDSD taskDSDsuspend</pre>

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. In addition to the above local users, members of LDAP groups can also access the CLI. Local users and LDAP users can use the same set of CLI commands. Only LDAP users with the <code>manage</code> role can create, modify, and delete both local users and LDAP user groups. For information about enabling access by LDAP users, see create user-group.
Minimum role	manage
Syntax	<pre>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 <IP-address>] [trap-port <port-number>] [type novice standard advanced diagnostic] [units auto MB GB TB] name</pre>
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.

- `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.
- `snmpuser`: Allows an SNMPv3 user to view the SNMP MIB and receive SNMP trap notifications. This option requires the `trap-host` parameter. To use a trap destination port other than the default port, also specify the `trap-port` parameter.
- `none`: No interfaces.

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 mode; required for API mode. 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. 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. 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.
- `standard`: User can view and change system settings except: configuring local users; configuring LDAP; performing write operations through FTP or SFTP; performing file uploads from the PowerVault Manager; using the `restore defaults` command.
- `manage`: User can view and change system settings.
- `diagnostic`: For use by or with direction from technical support.

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 <IP-address>`

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

`trap-port <port-number>`

Optional. For an SNMPv3 user, this parameter specifies the target port of the host that will receive SNMP traps. The default port is 162.

`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
```

	<pre>Enter new password: ***** Re-enter new password: ***** Create user testsnmp that can view the SNMP MIB and receive SNMP trap notifications, using authentication and encryption. # create user interfaces snmpuser password Abcd_1234 authentication-type SHA privacy-type AES privacy-password Abcd_5678 trap-host 172.22.4.171 testsnmp</pre>
See also	delete user set snmp-parameters set user show users

create user-group

Description	Creates a user group in the storage system to match an LDAP group. There are two sources of user credentials for the storage system: • The primary source is local users created by using the <code>create user</code> command. • The secondary source is an LDAP server. Users logging in using their LDAP credentials must authenticate using these credentials and be members of a group that is authorized to access the storage system. The group will exist on the LDAP server and will be listed under the <code>Member Of</code> property for the user account. The same group name must also exist in the storage system, and be created by using the <code>create user-group</code> command. Individual user preferences are not saved in the storage system. Any settings made to the login session are not retained after the session terminates. If the user wants to retain any preferences for the session, these must be saved as part of the user group. Any changes made to a user group will affect all members of that group. The system supports a maximum of 5 user groups to allow different permissions and user preferences. User group permissions are defined by assigning roles, the same as for local users. User group preference parameters include the storage size base, precision, and units; temperature scale; and timeout. User groups can be created whether the LDAP feature is enabled or disabled. Local users and LDAP users can use the same set of CLI commands. Only LDAP users with the <code>manage</code> role can create, modify, and delete both local users and LDAP user groups.  NOTE: Running the <code>restore defaults</code> command will clear LDAP user groups. For more information about the LDAP feature, see the <i>Dell PowerVault ME5 Series Administrator's Guide</i>.
Minimum role	manage
Syntax	<pre>create user-group [base 2 10] [interfaces <interfaces>] [precision <#>] [roles <roles>] [storage-size-base 2 10] [storage-size-precision <#>] [storage-size-units auto MB GB TB] [temperature-scale celsius c Fahrenheit f] [timeout <#>]</pre>

	<pre>[type LDAP] [units auto MB GB TB] <user-group-name></pre>
Parameters	<pre>base 2 10</pre> 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. 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. <pre>interfaces <interfaces></pre> Optional. Specifies the interfaces that the user group can access. Multiple values must be separated by commas and no spaces. • cli: Command-line interface. This is enabled by default. • wbi: Web-browser interface (the PowerVault Manager). This is enabled by default. • ftp: SFTP interface. • none: No interfaces. Only secure protocols are supported for the above interfaces. To enable or disable interface protocols, use the <code>set protocols</code> command. <pre>precision <#></pre> Optional. Sets the number of decimal places from 1 to 10 for display of storage-space sizes. <pre>roles <roles></pre> Optional. Specifies the user group role as one or more of the following values: • <i>monitor</i>: User group can view but not change system settings. This is the default. • <i>standard</i>: User group can view and change system settings except: configuring local users; configuring LDAP; performing write operations through SFTP; performing file uploads from the PowerVault Manager; using the <code>restore defaults</code> command. • <i>manage</i>: User group can view and change system settings. • <i>diagnostic</i>: For use by or with direction from technical support. Multiple values must be separated with a comma (with no spaces). If multiple values are specified, the user group's access to commands will be determined by the highest role specified. <pre>storage-size-base 2 10</pre> Optional. Alias for <code>base</code>. <pre>storage-size-precision <#></pre> Optional. Alias for <code>precision</code>. <pre>storage-size-units auto MB GB TB</pre> Optional. Alias for <code>units</code>. <pre>temperature-scale celsius c Fahrenheit f</pre> 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. <pre>timeout <#></pre> 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). <pre>type LDAP</pre> Optional. Identifies the user group type.

	<pre>units auto MB GB TB</pre> 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 <code>precision</code> 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 <code>units</code> is set to TB, <code>precision</code> is set to 1, and <code>base</code> is set to 10, the size 0.11709 TB is instead shown as 117.1 GB. <user-group-name> A name for the new user group, which must match the name used in the LDAP database including capitalization. Input rules: • The value is case sensitive. • The value can have a maximum of 29 bytes. • The value can include printable UTF-8 characters except a space or: " , < \ : • A value that includes a space must be enclosed in double quotes.
Examples	Create a volume group named <code>StorageAdmins</code> with the <code>manage</code> role for the CLI and SFTP interfaces. <pre># create user-group type ldap interfaces cli,ftp roles manage StorageAdmins</pre>
See also	delete user-group set ldap-parameters set user-group show audit-log show user-groups

create volume

Description	Creates a volume in a pool. Each linear disk-group has a dedicated pool of the same name. You must specify a size for the volume. You can optionally map the volumes to hosts. By default, this command will create the volumes unmapped. 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	standard
Syntax	<pre>create volume [access read-write rw read-only ro no-access] [initiator <initiators> <hosts> <host-groups>]</pre>

	<pre>[large-virtual-extents enabled disabled on off] [lun <LUN>] [ovms-uid <ID>] [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] [volume-group <volume-group>] <name></pre>
Parameters	<code>access read-write rw read-only ro no-access</code> Optional. The access permission to use for the mapping: read-write (rw), read-only (ro), or no-access. The default is read-write <code>initiator <initiators> <hosts> <host-groups></code> Optional. Specifies a comma-separated list of initiators or hosts or host-groups that can access the volume. If this parameter is specified, the lun parameter must also be specified. <code>large-virtual-extents enabled disabled on off</code> 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. <code>lun <LUN></code> Optional if the access parameter is set to no-access. Specifies the LUN to assign to the mapping on all ports. If this parameter is specified, the initiator parameter must also be specified. <code>ovms-uid <ID></code> Optional. For a volume to be accessed by an OpenVMS host, assign a volume ID 1-32767 to identify that volume to that host. <code>pool <pool></code> The name or serial number of the pool in which to create the volume. For linear storage use the disk group name as the pool value. <code>ports <ports></code> Optional. The controller ports through which the host can access the volume. For port syntax, see Command syntax. If this parameter is omitted, all ports are selected <code>size <size>[B KB MB GB TB KiB MiB GiB TiB]</code> 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 volume size for virtual storage is 128 TiB. The maximum volume size for linear storage is limited only by 64-bit addressing, so 8 ZiB with 512-byte sectors. For virtual storage, 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. <code>snapshot-retention-priority never-delete high medium low</code> 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. <code>tier-affinity no-affinity archive performance</code> 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. <code>volume-group <volume-group></code> 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. <code><name></code> 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 <code>v1</code> in pool A, and map it with LUN 5 through ports A1 and B1 to an initiator. <pre># create volume pool a size 20GB ports a1,b1 lun 5 initiator initiator001 v1</pre> Create a 100-GB volume named <code>MyVolume</code> in pool A, map it to use LUN 5 with read-write access through port 1 in each controller, add it to volume group <code>MyGroup</code>, and tune tier-migration for performance. <pre># create volume MyVolume pool A size 100GB access rw lun 5 initiator Host2 ports 1 volume-group MyGroup tier-affinity performance</pre> Create volume <code>v011</code> with snapshot retention priority high. <pre># create volume snapshot-retention-priority</pre>
See also	create volume-set delete volumes set volume show pools show ports 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. If the volume group will be replicated, it can contain a maximum of 16 volumes.
Minimum role	standard

Syntax	<pre>create volume-group volumes <volumes> <volume-group></pre>
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. <pre># create volume-group volumes Vol0001,Vol0002 VGroup1</pre>
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 optionally map the volumes to hosts. By default, this command will create the volumes unmapped. 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	standard
Syntax	<pre>create volume-set [access read-write rw read-only ro no-access] [baselun <base-LUN>] basename <base-name> count <#> [initiator <initiators> <hosts> <host-groups>] [large-virtual-extents enabled disabled on off] [pool <pool>] [ports <ports>]</pre>

	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] [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. If this parameter is specified, the initiator parameter must also be specified. 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 pA_v, if pA_v0000 and pA_v0002 exist, the next volumes created will be pA_v0001 and pA_v0003. count <#> The number of volumes to create, from 1 to 128. Volumes will be created up to the maximum number supported per pool. initiator <initiators> <hosts> <host-groups> Optional. Specifies a comma-separated list of initiators or hosts or host-groups that can access the volume. If this parameter is specified, the baselun parameter must also be specified. 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> The name or serial number of the pool in which to create the volumes. ports <ports> Optional. The controller ports through which the host can access the volume.. For port syntax, see Command syntax. 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. <code>snapshot-retention-priority never-delete high medium low</code> Optional. For virtual storage, this specifies the retention priority for snapshots of the volume set. • <code>never-delete</code>: Snapshots will never be deleted. • <code>high</code>: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted • <code>medium</code>: Snapshots may be deleted after all eligible low-priority snapshots have been deleted. This is the default. • <code>low</code>: Snapshots may be deleted. <code>tier-affinity no-affinity archive performance</code> Optional. For virtual storage, this specifies how to tune the tier-migration algorithm for the volume: • <code>no-affinity</code>: 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. • <code>archive</code>: 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. • <code>performance</code>: 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 <code>volume-group <volume-group></code> 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 <code>MyVol-</code> in pool B and add them to volume group <code>MyVG</code>. <pre># create volume-set count 2 size 100GB pool b basename MyVol- volume-group MyVG</pre> Create three 20-GB volumes with the base name <code>pA_vin</code> pool A, and map them starting with LUN 5 with read-only access through port A1 to three initiators. Create four 5 MB volumes with the base name <code>BV1_</code> with snapshot retention priority <code>high</code>. <pre># create volume-set pool B count 4 size 5MB basename BV1_ snapshot-retention-priority high volume-group Vol1</pre>
See also	create volume delete volumes map volume set volume show maps show pools 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	standard
Syntax	<pre>delete all-snapshots volume <volume></pre>
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. <pre># delete all-snapshots volume MV1</pre>
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. This command has a confirmation prompt in interactive console mode.
Minimum role	standard
Syntax	To delete the CHAP record for a specific originator: <pre>delete chap-records name <originator-name></pre> To delete all CHAP records: <pre>delete chap-records all</pre>
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. <pre># delete chap-records name iqn.1991-05.com.microsoft:myhost.domain</pre>

	Delete all CHAP records. <pre># delete chap-records all</pre>
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	standard
Syntax	<pre>delete host-groups [delete-hosts] <host-groups> all</pre>
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. <pre># delete host-groups HGroup1</pre> Delete all host groups and the hosts in those groups. <pre># delete host-groups delete-hosts all</pre>
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	standard
Syntax	<pre>delete hosts <hosts> all</pre>
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.

	• <code>all</code>: Deletes all hosts.
Examples	Delete hosts <code>Host1</code> and <code>Host2</code> . <pre># delete hosts Host1,Host2</pre> Delete all hosts. <pre># delete hosts all</pre>
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	standard
Syntax	<pre>delete initiator-nickname</pre> <code><initiator> all</code>
Parameters	<code><initiator> all</code> Specifies either: • The nickname or ID of the initiator to delete. A value that includes a space must be enclosed in double quotes. • <code>all</code>: Deletes all manually created initiators and nicknames of discovered initiators.
Examples	Delete the manually created initiator named <code>Init1</code> . <pre># delete initiator-nickname Init1</pre> Delete the nickname of discovered initiator <code>Init2</code> . <pre># delete initiator-nickname Init2</pre> Delete all manually created initiators and nicknames of discovered initiators. <pre># delete initiator-nickname all</pre>
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	standard
Syntax	<pre>delete peer-connection</pre>

	[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. <pre># delete peer-connection Peer1</pre>
See also	create peer-connection query peer-connection set peer-connection show peer-connections

delete pools

Description	Deletes specified pools and provides options for also performing data erasure.  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 <code>yes</code> , 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 <code>no</code> , 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 <code>yes</code> , 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 <code>no</code> , 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	standard
Syntax	<pre>delete pools [prompt yes no] <pools> [erase] [assurance-level secure sanitize]</pre>
Parameters	[prompt yes no] Optional. For scripting, this specifies an automatic reply to confirmation prompts: <code>yes</code>: Allow the command to proceed. <code>no</code>: Cancel the command. If this parameter is omitted, you must manually reply to prompts.

	<code><pools></code> 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. <code>erase</code> Optional. This string specifies data erasure. If this parameter is omitted, the command will not perform data erasure when deleting the specified pool. <code>assurance-level secure sanitize</code> Optional. This string specifies the <code>assurance-level</code> for the data erasure operation: • <code>secure</code>: Performs data erasure using cryptographic erase based on the Subsystem Security Class method that applies to the system SED (FDE-capable) drives. • <code>sanitize</code>: Performs data erasure with the <code>Sanitize</code> SCSI command, using the system SAS interface. If this parameter is omitted, the SC determines the appropriate <code>assurance-level</code> based on drive capability and system security status. If the parameter is provided and a failure occurs, the command returns the failed result. i NOTE: Considerations for using the optional data erasure command parameters: • The <code>assurance-level sanitize</code> option only works on an unsecured system. • The <code>assurance-level secure</code> option only works on FDE drives that are secured. If an FDE-capable drive is not secured, the <code>sanitize</code> option (using either overwrite or crypto erase) must be used.
Examples	Delete virtual pool A. <pre># delete pools A</pre> Delete linear pool <code>dg1</code>. <pre># delete pools dg1</pre> Delete virtual pool B and perform erasure on a system secured with FDE-capable drives. <pre># delete pools B erase assurance-level secure</pre>
See also	remove disk-groups show pools

delete remote-system

Description	Deletes the persistent association with a remote system. This command applies to linear storage only. i NOTE: Remote-system connections for linear replication are not supported for virtual replication. Instead you must create peer connections.
Minimum role	standard
Syntax	<pre>delete remote-system</pre> <code><system></code>
Parameters	<code><system></code> 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 <code>System2</code>. <pre># delete remote-system System2</pre>
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. 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	standard
Syntax	<pre>delete replication-set [local-only] <replication-set-ID></pre>
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. <pre># delete replication-set RS1</pre>
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	standard
Syntax	<pre>delete schedule [prompt yes no]</pre>

	<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 <i>Sched1</i>. <pre># delete schedule Sched1</pre>
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	standard
Syntax	<pre>delete snapshot</pre> <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. <pre># delete snapshot s1,s2,s3</pre>
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	standard
Syntax	<pre>delete task</pre> [prompt yes no] <task>

Parameters	<code>prompt yes no</code> Optional. For scripting, this specifies an automatic reply to confirmation prompts: • <code>yes</code>: Allow the command to proceed. • <code>no</code>: Cancel the command. If this parameter is omitted, you must manually reply to prompts. <code><task></code> The name of the task to delete.
Examples	Delete task Task1. <pre># delete task Task1</pre>
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 <code>manage</code> 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	<code>manage</code>
Syntax	<pre>delete user</pre> <i>[noprompt]</i> <code><name></code>
Parameters	<code>noprompt</code> Optional. Suppresses confirmation prompts. Specifying this parameter enables the command to proceed without user interaction. <code><name></code> The user to delete. Names are case-sensitive.
Examples	Delete user jsmith. <pre># delete user jsmith</pre>
See also	create user show users

delete user-group

Description	Deletes an LDAP user group. The system requires at least one local user with the <code>manage</code> role to exist. Deleting a user group does not affect the active user session. This command has a confirmation prompt in interactive console mode.
Minimum role	<code>manage</code>

Syntax	<pre>delete user-group [noprompt] <user-group-name></pre>
Parameters	<code>noprompt</code> Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction. <code><user-group-name></code> The user group to delete. Names are case sensitive.
Examples	<pre>Delete user group StorageAdmins. # delete user-group StorageAdmins</pre>
See also	create user-group show user-groups

delete volume-groups

Description	Deletes specified volume groups and optionally all volumes in those groups.  NOTE: For virtual storage, before you can delete a volume group that is in a replication set you must delete the replication set.
Minimum role	standard
Syntax	<pre>delete volume-groups [delete-volumes] <volume-groups> all</pre>
Parameters	<code>delete-volumes</code> 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. <code><volume-groups> all</code> 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. • <code>all</code>: Deletes all volume groups.
Examples	<pre>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</pre>
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	standard
Syntax	<pre>delete volumes <volume></pre>
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. <pre># delete volumes vol1,vol2</pre>
See also	create volume show volumes

dequarantine

Description	Removes a disk group from quarantine.  CAUTION: This command should only be used by or with direction from technical support.  NOTE: Dequarantine is not permitted for a disk group that contains data in a format that is not supported by this system. An unsupported disk group has status QTUN. If you want to use the disk group disks in this system, and you are sure that the data in this disk group is not needed, remove the disk group by using the <code>remove disk-groups</code> command. The system will automatically quarantine a disk group having a fault-tolerant RAID level if one or more of its disks becomes inaccessible. If quarantine occurs because of an inaccessible disk, event 172 is logged. The <code>dequarantine</code> command is not permitted in this case. Contact technical support, or refer to the <code>trust</code> command in this situation. The system will automatically quarantine a disk group to prevent invalid data that may exist in the controller from being written to the disk group. If quarantine occurs to prevent writing invalid data, event 485 is logged. Use the <code>dequarantine</code> command to manually dequarantine the disk group only as specified by the event recommended-action text to avoid data corruption or loss.  NOTE: The only commands allowed for a quarantined disk group are <code>dequarantine</code> and <code>trust</code>. 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	standard
Syntax	<pre>dequarantine disk-group <disk-group></pre>
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.
Examples	Dequarantine disk group dgB01. <pre># dequarantine disk-group dgB01</pre>
See also	show disk-groups

erase disk

Description	Erases data from a single disk drive.  CAUTION: Erasing a disk drive will remove all the data it contains. This command supports qualified hard disk drives (HDD), self-encrypting drives (SED), Instant Secure Erase (ISE) drives, and solid-state drives (SSD).
Minimum role	standard
Syntax	<pre>erase disk <enclosure:slot> [assurance-level secure sanitize]</pre>
Parameters	<code><enclosure:slot></code> A colon-separated pair of integers specifying the drive targeted for data erasure. If this parameter is omitted, a message states that the disk specifier is missing, and the command exits. <code>assurance-level secure sanitize</code> Optional. This string specifies the <code>assurance-level</code> for the data erasure operation: • <code>secure</code>: Performs data erasure using cryptographic erase based on the Subsystem Security Class method that applies to the SED (FDE-capable) drives in the system. • <code>sanitize</code>: Performs data erasure with the <code>Sanitize</code> SCSI command, using the system SAS interface. If this parameter is omitted, the SC determines the appropriate <code>assurance-level</code> based on drive capability and system security status. If the parameter is provided and a failure occurs, the command returns the failed result.  NOTE: Considerations for using the optional data erasure command parameters: • The <code>assurance-levelsanitize</code> option works only on an unsecured system. • The <code>assurance-levelsecure</code> option works only on FDE drives that are secured. If an FDE-capable drive is not secured, the <code>sanitize</code> option (using either overwrite or crypto erase) must be used.
Examples	Perform erasure on the drive residing in slot (5) of enclosure (0), which is secured with FDE-capable drives. <pre># erase disk 0.5 assurance-level secure</pre> Perform erasure on the drive residing in slot (11) of enclosure (2), which is not secured with FDE-capable drives. <pre># erase disk 2.11 assurance-level sanitize</pre>
See also	delete pools remove disk-groups show disk-groups show disks show pools

exit

Description	Log off and exit the CLI session.
Minimum role	monitor
Syntax	<pre>exit</pre>

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, and must be in the same tier as the disk group. The new disks need not have consistent capacity. ADAPT algorithms will attempt to use the maximum possible space on each disk in the group. However, some capacity will be unusable. How much depends on the number of disks in the group and the size difference between the disks: - Disk groups with few disks (such as 12 disks) won't effectively use the capacity of all the disks if they are different sizes. For example, a group composed of eleven 2TB disks and one 1TB disk will have a usable capacity closer to 12TB than 24TB. - Disk groups with a large number of disks can handle different size disks with much more effective use of capacity. 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: <table><tr><th>RAID level</th><th>Expansion capability</th><th>Maximum disks</th></tr><tr><td>NRAID</td><td>Cannot expand.</td><td>1</td></tr><tr><td>0</td><td>Can add 1–4 disks at a time.</td><td>16</td></tr><tr><td>1</td><td>Cannot expand (linear storage).</td><td>2</td></tr><tr><td>5</td><td>Can add 1–4 disks at a time</td><td>16</td></tr><tr><td>6</td><td>Can add 1–4 disks at a time.</td><td>16</td></tr><tr><td>10</td><td>Can add 2 or 4 disks at a time (linear storage).</td><td>16</td></tr><tr><td>ADAPT</td><td>Can add up to 68 disks at a time.</td><td>128</td></tr></table> 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 for 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 <code>set disk-group adapt-target-spare-capacity</code> 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: If you want to make spare capacity changes, do so by using the <code>set disk-group</code> command before starting disk-group expansion. 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. For ADAPT disk groups, expansion 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.	RAID level	Expansion capability	Maximum disks	NRAID	Cannot expand.	1	0	Can add 1–4 disks at a time.	16	1	Cannot expand (linear storage).	2	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	ADAPT	Can add up to 68 disks at a time.	128
RAID level	Expansion capability	Maximum disks																							
NRAID	Cannot expand.	1																							
0	Can add 1–4 disks at a time.	16																							
1	Cannot expand (linear storage).	2																							
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																							
ADAPT	Can add up to 68 disks at a time.	128																							
Minimum role	standard																								

Syntax	<pre>expand disk-group disks <disks> [prompt yes no] <disk-group></pre>
Parameters	<code>disks <disks></code> The IDs of the disks to add. For disk syntax, see Command syntax. <code>prompt yes no</code> Optional. For scripting, this specifies an automatic reply to confirmation prompts: • <code>yes</code>: Allow the command to proceed. • <code>no</code>: Cancel the command If this parameter is omitted, you must manually reply to prompts. <code><disk-group></code> 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. <pre># expand disk-group disks 1.11 DG1</pre> Expand a RAID-10 disk group named R10 to include an additional mirror pair. <pre># expand disk-group disks 2.9-10 R10</pre> Add 10 disks to ADAPT disk group Data3. <pre># expand disk-group disks 1.1-10 Data3</pre>
See also	set disk-group (to set spare capacity before expansion) show disk-groups show disks

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). You cannot expand a replication set's secondary volume. However, you can expand a replication set's primary volume, which will automatically expand its secondary volume, even if replication is in progress. For linear storage, if insufficient space is available for expansion in the disk group, first expand the disk group by using <code>expand disk-group</code>.
Minimum role	standard
Syntax	<pre>expand volume size <size> [B KB MB GB TB KiB MiB GiB TiB] max <volume></pre>
Parameters	<pre>size <size> [B KB MB GB TB KiB MiB GiB TiB] max</pre>

	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. The maximum volume size for virtual storage is 128 TiB. The maximum volume size for linear storage is limited only by 64-bit addressing, so 8 ZiB with 512-byte sectors. For linear storage, if <code>max</code> is specified, the volume will expand 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 <code>v1</code> by 100 GB. <pre># expand volume size 100GB v1</pre>
See also	expand disk-group 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: <pre>help</pre> To view help for a command name, enter: <pre>help <command-name></pre> To view information about the syntax for specifying parameters, disks, and so forth, enter: <pre>help syntax</pre> To view the information shown in this topic, enter: <pre>help help</pre>
Examples	Show brief help for all available commands: <pre># help</pre> Show full help for the show cli-parameters command: <pre># help show cli-parameters</pre>

map volume

Description	Maps volumes to initiators. This command can be used to modify existing mappings or create new mappings. 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 attach the volume and will report an error such as "unknown partition table."

Minimum role	standard
Syntax	<pre>map volume [access read-write rw read-only ro no-access] initiator <initiators> <hosts> <host-groups> [lun <LUN>] [ports <ports>] <volumes></pre>
Parameters	<code>access read-write rw read-only ro no-access</code> Optional. The access permission to use for the mapping: <code>read-write (rw)</code>, <code>read-only (ro)</code>, or <code>no-access</code>. <code>no-access</code> causes the volume to be masked from specified initiators. If the access parameter is omitted, access is set to <code>read-write</code>. <code>initiator <initiators> <hosts> <host-groups></code> 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.  NOTE: If an initiator is specified, at least one LUN must also be specified. <code>lun <LUN></code> 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 <code>lun</code> parameter is ignored if access is set to <code>no-access</code>. <code>ports <ports></code> 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. The <code>ports</code> parameter is ignored if access is set to <code>no-access</code>. If the <code>ports</code> parameter is omitted, all ports are mapped. <code><volumes></code> A comma-separated list of the names or serial numbers of the volumes to map. For volume syntax, see Command syntax.
Examples	Map volume <code>vol2</code> with read-only access to initiator <code>Init1</code>, using port <code>A1</code> and LUN <code>100</code>. <pre># map volume access ro ports a1 lun 100 initiator Init1 vol2</pre> Map volumes <code>vol2</code> and <code>vol3</code> with read-write access for <code>Host1.*</code>, using ports <code>A1</code> and <code>B1</code> and LUN <code>101</code>. <pre># map volume access rw ports a1,b1 lun 101 initiator Host1.* vol2,vol3</pre> Mask volume <code>vol4</code> from <code>Init1</code> and <code>Init3</code>. <pre># map volume vol4 access no-access lun 101 initiator Init1,Init3</pre> Map volumes <code>vol1</code> and <code>vol2</code> to initiators <code>Init1</code> and <code>Init2</code>, using ports <code>A1</code> and <code>B1</code> starting with LUN <code>6</code>. <pre># map volume ports a1,b1 lun 6 initiator Init1,Init2 vol1,vol2</pre>
See also	show host-groups show initiators show maps show ports show volumes unmap volume

meta

Description	In API format only, shows all property metadata for objects. This includes data not shown in <code>brief</code> mode.
Minimum role	monitor
Syntax	<code>meta</code> <code><basetypes></code>
Parameters	<code><basetypes></code> 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: <pre># meta drives</pre>
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	<code>ping</code> <code>[count <count>]</code> <code><host-address></code> <code>[packet-size <size>]</code>
Parameters	<code>count <count></code> Optional. The number of packets to send. Use a small count because the command cannot be interrupted. The default is 4 packets. This parameter accepts a maximum value of 2,147,483,647. <code><host-address></code> The network address of the remote host. The value can be an IPv4 address, IPv6 address, or FQDN. <code>packet-size <size></code> Optional. The packet size in bytes. The default value is 56 bytes.
Examples	Send two packets to the remote computer at <code>10.134.50.6</code> . <pre># ping 10.134.50.6 count 2</pre>

query metrics

Description	Shows one or more collected data points for a list of metrics. Before you can view metrics, you must start metric retention by using the <code>start metrics</code> command.
Minimum role	monitor
Syntax	<code>query metrics</code> <code>[calculate average max min count sum]</code>

	<pre>[count <number-of-data-samples> all] [database dynamic historical] [filename <filename>.csv] [time-range "<date/time-range>"] metrics-list</pre>
Parameters	calculate average max min count sum Optional. Instead of listing columns of metric data points, apply a calculation to each column and display a single, summary value for each column. <pre>[count <number-of-data-samples> all]</pre> Optional. Specifies the number of data samples to display, from 1 to 5000, or all available samples. Each sample is shown as a separate row in the command output. If this parameter is omitted, 100 samples are shown. If you specify this parameter, do not specify the time-range parameter. Due to memory consumption limits, it is recommended to use the all parameter with the filename parameter to direct output to a CSV file instead of to the console. If the filename parameter is not specified, the all parameter might display an error message requiring you to reduce the sample count or the number of requested metrics or both. <pre>[database dynamic historical]</pre> Optional. Specifies whether to run the query on current dynamic data or historical data. The default is dynamic. <pre>[filename <filename>.csv]</pre> Optional. Saves metrics to a CSV file that is accessible from either controller module. To access the file, use SFTP or FTP. Files are created in the metrics/ folder. Use the cd command to change to the metrics/ folder and the ls command to list folder contents. The folder is limited to 20 files and/or 100MB of total space consumed. As the folder fills, the system automatically deletes the oldest files to make space for new files. NOTE: In your SFTP/FTP client, if entering get metrics/<filename>.csv displays an error, try entering get metrics/<filename>.csv <filename>.csv instead. <pre>[time-range "<date/time-range>"]</pre> Optional. Specifies the date/time range of historical metrics to query, 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 is used as the end date/time. The system returns 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 is used as the start date/time. If you specify this parameter, do not specify the count parameter. If both the count and time-range parameters are omitted, the most recent 100 data samples are displayed. Times are saved at a strict cadence of :00, :05, :10 seconds, and so on. To display a single value at a particular time, ensure that the start and end times are identical and match a sample time exactly. <pre>metrics-list</pre> Specifies a comma-separated list of metrics whose data points you want to display. For each metric use the format <i>typefield.instance</i>, where: <i>type</i> is a type of storage object; <i>field</i> is a specific measured property of that object; and <i>instance</i> is the name or serial number of that object. If the instance value contains a space, the entire metric must be enclosed in double quotes. For example: "volume.read-iops.My Vol1". Do not include an instance value for system metrics. If database historical is specified, you can optionally specify to show maximum, minimum, or average values. Each historical data point is calculated from a range of dynamic data points. The default data point calculation is based on the average of the dynamically sampled data points. However, historical data also retains minimum and maximum values for each calculated historical data point. To show minimum values append @min; to show maximum values append @max; to explicitly show average values append @average. For example: "volume.read-iops@max.My Vol1". Available metrics and applicable storage objects:

	• <code>total-avg-response-time</code>: Average response time of an operation in microseconds. Operations include both reads and writes. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>total-bytes-per-second</code>: Sum of read bytes per second and write bytes per second. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>total-iops</code>: Sum of read IOPS and write IOPS. Applicable storage objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>total-max-response-time</code>: Sum of read maximum response time and write maximum response time. Applicable storage objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>total-num-bytes</code>: Sum of read bytes and write bytes. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>read-io-count</code>: Number of read I/O operations. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>read-ahead-ops</code>: Number of times that read ahead pre-fetched data for host reads. Applicable objects: <code>controller</code>, <code>volume</code>. • <code>read-avg-queue-depth</code>: Average number of pending read operations being serviced since the last sampling time. This value represents periods of activity only and excludes periods of inactivity. Applicable objects: <code>host-port</code>, <code>volume</code>. • <code>read-avg-response-time</code>: I/O read average response time in microseconds. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>read-bytes-per-second</code>: Number of bytes read per second. Applicable storage objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>read-iops</code>: Number of I/Os per second. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>read-max-response-time</code>: Maximum I/O read response time in microseconds. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>read-num-bytes</code>: Number of bytes read since the last time this data point was sampled. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>small-destages</code>: Number of partial stripe destages. (These tend to be very inefficient compared to full stripe writes.) Applicable objects: <code>controller</code>, <code>volume</code>. • <code>write-io-count</code>: Number of write I/O operations. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>rite-avg-queue-depth</code>: Average number of pending write operations being serviced since the last sampling time. This value represents periods of activity only and excludes periods of inactivity. Applicable objects: <code>host-port</code>, <code>volume</code>. • <code>write-avg-response-time</code>: I/O write average response time in microseconds. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>write-bytes-per-second</code>: Number of bytes written per second. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>write-cache-space</code>: Current size of write cache in 16KB chunks. Applicable objects: <code>controller</code>, <code>volume</code>. • <code>write-cache-percent</code>: Percentage of write cache currently being used in tenths of a percent. Applicable objects: <code>controller</code>, <code>volume</code>. • <code>write-full-stripe-destages</code>: Number of full stripe destages, which are the most efficient destage type. Applicable objects: <code>controller</code>, <code>volume</code>. • <code>write-iops</code>: Number of I/Os per second. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>write-max-response-time</code>: Maximum I/O write response time in microseconds. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. • <code>write-num-bytes</code>: Number of bytes written since the last time this data point was sampled. Applicable objects: <code>controller</code>, <code>host-port</code>, <code>pool</code>, <code>system</code>, <code>volume</code>. Metrics for the system storage object are synthesized from data captured by controller storage objects.
Output	Column Key For each specified metric, the numeric ID of the corresponding column in the displayed data table. Column IDs increment from 01.

	Time The date/time of data points in the same row. 01 The data points for the first specified metric. <IDs> The data points for other specified metrics, if any.
Examples	Show the most recent ten data points for the system's average read response time metric. <pre># query metrics count 10 system.read-avg-response-time</pre>
See also	show metrics-list start metrics stop metrics

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 <code>Reachable Local Links</code> values.
Minimum role	monitor
Syntax	<pre>query peer-connection remote-port-address</pre>
Parameters	<i>remote-port-address</i> Specifies the FC WWN or iSCSI IP address of the system to query. IPv4 and IPv6 formats are supported.
Output	Peer connection information: <code>System Name</code> The name of the system. <code>System Contact</code> The name of the person who administers the system. <code>System Location</code> The location of the system. <code>System Information</code> A brief description of what the system is used for or how it is configured. <code>Midplane Serial Number</code> The serial number of the controller enclosure midplane. <code>Vendor Name</code> The vendor name. <code>Product ID</code>

	The product model identifier. License information Shows output of the show license command. Peer controllers information: 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. <pre># query peer-connection 192.168.200.22</pre>
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 <code>failback-restore</code> and <code>reverse</code> operations are designed to discard the latest updates to the primary volume since the last successful replication and replace it with the secondary volume which has been updating while in failover state. To mitigate potential problems, take snapshots of both the primary and secondary volumes before performing this recovery operation. Performing a failover operation Run this operation on the secondary system to move the replication set into "failed over" state. In this state, all scheduled or current replications of the replication set will cease and the secondary volume can be mapped and accessed for use (including rollback to the contents of any manually created or snapshot-history snapshot). Before performing <code>failover</code>, create a snapshot of the secondary volume to preserve the contents of the last replication, if snapshot history was not enabled. Performing a failback-restore operation This is a two-step operation that can restore the primary system using updates made to the secondary volume while the replication set was failed over to the secondary system. First, run this operation on the secondary system. This will unmap the primary volume and the secondary volume and put the replication set in a temporary "failback-restore" state that permits a replication to go in the opposite direction: from the secondary volume to the primary volumes. Once the direction has been temporarily reversed, data from the secondary volume is replicated to the primary volume. At this point, data has been restored from the secondary system, but the replication set remains in a temporary state. Host mappings to either primary or secondary volumes are blocked when in this state. Replication snapshot history is suppressed while a <code>failback-restore</code> operation is in progress. Second, run this operation on the primary system. This will reverse replication back to the normal direction: from the primary volume to the secondary volume. The temporary state imposed by the first step will be removed and the replication set will return to normal operation. Performing a failback-no-restore operation This restores the replication set to functioning as it did before the <code>failover</code> operation was performed. If the secondary volume was mapped while in "failed over" state, it will be unmapped. The direction of replication will not be changed from the original configuration and it will not automatically start a replication. After this operation completes, any updates to the secondary volume will remain. However, updates to the secondary volume will be discarded when the next replication request is completed. Performing a reverse operation This allows the replication set to return to normal operation, but with the replication roles reversed: the original primary volume becomes the secondary volume and the original secondary volume becomes the primary volume. The original primary volume becomes unmapped. The operation preserves any updates that may have been done to the original secondary volume while it was in "failed over" state, but does not automatically move these updates to the original primary volume. The next replication run will move these updates from the new primary volume to the new secondary volume, and will delete any changes made to the secondary (original primary) since the last replication.
Minimum role	standard
Syntax	<pre>recover replication-set operation failover failback-restore failback-no-restore reverse <replication-set-ID></pre>
Parameters	<pre>operation failover failback-restore failback-no-restore reverse</pre>

	Specifies the operation to perform, as described above. failover: Moves the replication set into the "failed over" state 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-restore: Restores the primary system using updates made to secondary volumes while the replication set was failed over to the secondary system. You must run this first on the secondary system and then on the primary system. The system displays two confirmation prompts when run on the secondary system, and one confirmation prompt when run on the primary system. To use this option on the secondary system: • The replication set must be in the "failed over" state. • Peers must be operational with both systems healthy and communicating. When this option is run on the secondary system, a "reverse" replication is run. To use this option on the primary system: • The replication set must be ready, with the <code>Failback In Progress</code> field showing <code>True</code>. • The primary and secondary volumes must be unmapped. (Unmapping occurs when this option runs on the secondary system. Mapping is not possible while <code>Failback In Progress</code> is <code>True</code>.) • Replication from secondary volumes back to primary volumes must be complete. 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. The system displays two confirmation prompts. To use this option: • The replication set must be in the "failed over" state. • Peers must be operational with both systems healthy and communicating. <code><replication-set-ID></code> 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, run the following command: <pre># recover replication-set operation failover RS1</pre> Next map the secondary volume to start updates to data on the secondary volume. After repairs have been made, bring the primary system is back online, and establish peer communication. Replace the old data on the primary system with the current data on the secondary system. During this process preserve the data state of volumes on the primary systems to avoid risk of data loss. Follow these steps to replace the data: 1. On the primary system, snap local replication set volumes. 2. On the secondary system: a. Snap local replication set volumes. b. Run: <code>recover replication-set operation failback-restore RS1</code> 3. On the primary system: a. Confirm that the replication has completed by periodically running: <code>show replication-sets RS1</code> b. Run: <code>recover replication-set operation failback-restore RS1</code>

	c. 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	standard
Syntax	<pre>release volume all <volumes></pre>
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. <pre># release volume gd04_v0002</pre>
See also	show volume-reservations show volumes

remote

Description	Runs a command on a remote system that is associated with the local system. If the command cannot connect to remote controller module A, it tries to connect to remote controller module B. If it is unsuccessful, the remote command is not run. Output is displayed in console or API mode depending on the local system setting. This command will not display prompts to confirm remote actions. Use caution when issuing remote commands to avoid risk of data loss or unavailability.
Minimum role	standard
Syntax	<pre>remote <remote-system> <command></pre>
Parameters	<remote-system> The name or network-port IP address of the remote system. A name that includes a space must be enclosed in double quotes. An address can be an IPv4 address, IPv6 address, or FQDN. <command> The full name of any CLI command that is valid for the remote user role.

Examples	Run the <code>show system</code> command on remote system <code>System2</code> . <pre># remote System2 show system</pre>
See also	show remote-systems

remove certificate

Description	Deletes a user-supplied certificate from the system. This command removes a user-supplied certificate whether it is active or inactive. You can remove device or server certificates and trust certificates. When the certificate being removed is the active certificate for a service: • If there is a default system-supplied certificate available for the service, the system uses the default certificate. • If no default system-supplied certificate is available for the service, the console prompts you to activate a certificate for the service. The service might not function as expected until a new certificate is applied. In either case, you must restart the management controller for the changes to take effect.  NOTE: You cannot remove a system-generated certificate.
Minimum role	manage
Syntax	<pre>remove certificate <name></pre>
Parameters	<name> The name of the certificate to remove. Use the <code>show certificates</code> command to list all certificates, where you can view certificate names. You can only remove certificates labeled as Customer-supplied.
Examples	Remove a certificate named <code>CERT_A_12345</code>. <pre># remove certificate CERT_A_12345</pre>
See also	create certificate show certificate

remove disk-groups

Description	Removes specified disk groups and provides options for also performing data erasure.  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 status will be <code>VDRAIN</code>. 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 an out-of-space condition, the command will fail and an event will be logged. i 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. i 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	standard
Syntax	<pre>remove disk-groups [prompt yes no] <disk-groups> [erase] [assurance-level secure sanitize]</pre>
Parameters	<code>prompt yes no</code> Optional. For scripting, this specifies an automatic reply to confirmation prompts: • <code>yes</code>: Allow the command to proceed. • <code>no</code>: Cancel the command. If this parameter is omitted, you must manually reply to prompts. <code>disk-groups</code> 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. <code>[erase]</code> Optional. This string specifies data erasure. If this parameter is omitted, the command will not perform data erasure when deleting the specified disk group. <code>[assurance-level secure sanitize]</code> Optional. This string specifies the <code>assurance-level</code> for the data erasure operation: • <code>secure</code>: Performs data erasure using cryptographic erase based on the Subsystem Security Class method that applies to the SED (FDE-capable) drives in the system. • <code>sanitize</code>: Performs data erasure with the <code>Sanitize</code> SCSI command, using the system SAS interface. If this parameter is omitted, then the SC determines the appropriate <code>assurance-level</code> based on drive capability and system security status. If the parameter is provided and a failure occurs, the command returns the failed result. i NOTE: Considerations for using the optional data erasure command parameters: • The <code>assurance-level sanitize</code> option will only work on an unsecured system.

	The <code>assurance-level secure</code> option will only work on FDE drives that are secured. If an FDE-capable drive is not secured, then the <code>sanitize</code> option (using either <code>overwrite</code> or <code>crypto erase</code>) must be used.
Examples	Remove disk groups <code>dg1</code> and <code>dg2</code>. <pre># remove disk-groups dg1,dg2</pre> Remove disk group <code>dg1</code> and perform erasure on a system secured with FDE-capable drives. <pre># remove disk-groups dg1 erase assurance-level secure</pre>
See also	delete pools show disk-groups

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	standard
Syntax	<pre>remove host-group-members hosts <hosts> <host-group></pre>
Parameters	<code>hosts <hosts></code> 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. <code><host-group></code> The name of the host group. A name that includes a space must be enclosed in double quotes.
Examples	Remove two hosts from a host group that contains three hosts. <pre># remove host-group-members hosts Host2,Host3 HostGroup1</pre>
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	standard
Syntax	<pre>remove host-members initiators <initiators> <host-name></pre>
Parameters	<code>initiators <initiators></code> 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	From group FC-host11, which contains three initiators, remove initiators FC-init2 and FC-init3. <pre># remove host-members initiators FC-init2,FC-init3 FC-host11</pre>
See also	delete hosts show initiators

remove ipv6-address

Description	Removes a static IPv6 address from a controller network port.  NOTE: When the autoconfig parameter in the set ipv6-network-parameters is disabled, you cannot remove the last IPv6 address.
Minimum role	standard
Syntax	<pre>remove ipv6-address [address-label <name>] [controller a b] [index <index>] [ip-address <IP-address>]</pre>
Parameters	The parameters must be used in one of these ways: • controller & index • controller & address-label • index only • IP address only 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 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. <pre># remove ipv6-address controller a address-label vlan1</pre>
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	standard
Syntax	<pre>remove spares <disks></pre>
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. <pre># remove spares 1.21-22</pre> Remove spare 1.22. <pre># remove spares 1.22</pre>
See also	add 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: You cannot add a volume to a volume group that is in a replication set. This command has a confirmation prompt in interactive console mode.
Minimum role	standard
Syntax	<pre>volumes <volume-IDs> <volume-group></pre>
Parameters	<code>volumes <volume-IDs></code> 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. <code><volume-group></code> The name of the volume group. A name that includes a space must be enclosed in double quotes.
Examples	Remove volumes <code>Vo10002</code> and <code>Vo10003</code> from volume group <code>VolumeGroup1</code>. <pre># remove volume-group-members volumes Vo10002,Vo10003 VolumeGroup1</pre>
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 primary system of the replication set. 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. Interaction with replication snapshot history: • If the replication set <code>snapshot-history</code> parameter is set to <code>secondary</code>, a snapshot of the secondary volume will be made on the secondary system, after the replication has completed. • If the replication set <code>snapshot-history</code> parameter is set to <code>both</code>, a snapshot of the primary volume will be made on the primary system, prior to replicating. This is in addition to a snapshot of the secondary volume that will be made on the secondary system.
Minimum role	standard
Syntax	<pre>replicate [<i>last-snapshot</i>] [<i>snapshot <snapshot-ID></i>] <<i>replication-set-ID</i>></pre>
Parameters	<code>last-snapshot</code> 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 <code>snapshot</code> parameter. <code>snapshot <snapshot-ID></code> 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 <code>last-snapshot</code> parameter.  NOTE: This operation can affect the order of replication revisions, making the secondary retention set confusing to understand. <<i>replication-set-ID</i>> The name or serial number of the replication set to replicate.
Examples	Replicate the volumes in replication set RS1. <pre># replicate RS1</pre> Replicate the most recent snapshot of volumes in replication set RS1. <pre># replicate last-snapshot RS1</pre> Replicate snapshot RS1V1Snap3 in replication set RS1. <pre># replicate snapshot RS1V1Snap3 RS1</pre>
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. A manual rescan may be required to discover newly inserted SED (self-encrypting drive) disks in an FDE secured system.
Minimum role	standard
Syntax	<code>rescan</code>
Examples	Scan for device changes and re-evaluate enclosure IDs. <pre># rescan</pre>

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	standard
Syntax	<pre>reset all-statistics [historical] [prompt yes no]</pre>
Parameters	<code>historical</code> 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. <code>prompt yes no</code> Optional. For scripting, this specifies an automatic reply to the confirmation prompt that will appear if the <code>historical</code> parameter is specified: • <code>yes</code>: Allow the command to proceed • <code>no</code>: Cancel the command If the <code>historical</code> parameter is specified and the <code>prompt</code> parameter is omitted, you must manually reply to the prompt. If the <code>historical</code> parameter is omitted, the <code>prompt</code> parameter has no effect. There is no confirmation prompt for live statistics
Examples	Reset all live statistics for both controllers. <pre># reset all-statistics</pre> Reset all historical disk-performance statistics for both controllers. <pre># reset all-statistics historical</pre>
See also	reset controller-statistics reset disk-error-statistics

	reset disk-group-statistics reset disk-statistics reset host-port-statistics reset pool-statistics reset volume-statistics show controller-statistics

reset ciphers

Description	Clears user-supplied ciphers and sets the cipher list to the system default. The command will prompt you to restart both Management Controllers to activate the ciphers. The change will take effect when the restart is complete. If you change any cipher settings between running the reset ciphers command and restarting the Management Controllers, those changes will be ignored.
Minimum role	manage
Syntax	reset ciphers
Examples	Reset the cipher list to the system default. <pre># reset ciphers</pre>
See also	set ciphers show ciphers

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	standard
Syntax	<pre>reset controller-statistics</pre> [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. <pre># reset controller-statistics</pre>
See also	reset all-statistics reset disk-error-statistics reset disk-group-statistics reset disk-statistics reset host-port-statistics reset pool-statistics reset volume-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	standard
Syntax	<pre>reset disk-error-statistics [<disks>]</pre>
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. <pre># reset disk-error-statistics 1.1,2.1</pre>
See also	reset all-statistics reset controller-statistics reset disk-group-statistics reset disk-statistics reset host-port-statistics reset pool-statistics reset volume-statistics]show disk-statistics show disks

reset disk-group-statistics

Description	Clears resettable performance statistics for specified disk groups, and resets timestamps for those statistics. This command applies to linear storage only.
Minimum role	standard
Syntax	<pre>reset disk-group-statistics <disk-groups></pre>
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. <pre># reset disk-group-statistics dg1</pre>
See also	reset all-statistics reset disk-error-statistics reset controller-statistics reset disk-statistics reset host-port-statistics reset pool-statistics reset volume-statistics show disk-group-statistics show 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	standard
Syntax	<pre>reset disk-statistics</pre>
Examples	Reset statistics for all disks. <pre># reset disk-statistics</pre>
See also	reset all-statistics reset disk-error-statistics reset controller-statistics reset disk-group-statistics reset host-port-statistics reset pool-statistics reset volume-statistics show disk-group-statistics

reset dns-management-hostname

Description	Resets each controller module's management host name to the factory default. The factory default is: <code><SCSI-vendor-ID><midplane-serial-number><controller-ID></code> . (The value does not include angle brackets, which are shown here to delimit fields within the value.)
Minimum role	standard
Syntax	<pre>reset dns-management-hostname</pre>

	[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. <pre># reset dns-management-hostname controller a</pre>
See also	clear dns-parameters set dns-management-hostname set dns-parameters show dns-management-hostname 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 cannot reset individual ports; this command resets all ports on the specified controller. For SAS, you cannot reset individual ports; this command resets all ports on the specified controller. This command has a confirmation prompt in interactive console mode.
Minimum role	standard
Syntax	<pre>reset host-link ports <ports></pre>
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. For iSCSI, all ports on the specified controller are reset, regardless of which port number you enter. For SAS, all ports on the specified controller are reset, regardless of which port number you enter.
Examples	Reset the host link on port A1. <pre># reset host-link ports A1</pre>
See also	show ports

reset host-port-statistics

Description	Resets performance statistics for controller host ports.
Minimum role	standard
Syntax	<pre>reset host-port-statistics [ports <ports>]</pre>
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 volume-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	standard
Syntax	reset pool-statistics <i>[pool]</i>
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 controller-statistics reset disk-error-statistics reset disk-group-statistics reset host-port-statistics reset disk-statistics reset volume-statistics show pool-statistics show pools

reset snapshot

Description	Replaces the data in a standard snapshot with the current data from its parent volume. The snapshot volume characteristics are not changed. Any snapshot in a snapshot tree can be reset, but the data source can only be the immediate parent of the snapshot. For example, in the following snapshot tree:

	Voll <pre> - VollSnap - VollSnapSnap</pre> you can reset VollSnap to Voll, or reset VollSnapSnap to VollSnap. 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	standard
Syntax	<pre>reset snapshot [prompt yes no] <snapshot></pre>
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 VollSnap. <pre># reset snapshot VollSnap</pre>
See also	show snapshots

reset volume-statistics

Description	Resets performance statistics for all or specified volumes.
Minimum role	standard
Syntax	<pre>reset volume-statistics [<volumes>]</pre>
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 dg1_v0001. <pre># reset volume-statistics dg1_v0001</pre>
See also	reset all-statistics reset controller-statistics reset disk-error-statistics reset disk-group-statistics reset disk-statistics reset host-port-statistics

	reset pool-statistics show volume-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	standard
Syntax	<pre>restart mc [a b both] [noprompt]</pre>
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. <pre># restart mc a</pre>
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 user 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	standard
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	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] 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.
Examples	Restore the default configuration on the controllers. # restore defaults

See also	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	standard
Syntax	<pre>resume replication-set <replication-set-ID></pre>
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. <pre># resume replication-set RS1</pre>
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 command applies to virtual storage only. 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: <pre>Vol1 - Vol1Snap - Vol1SnapSnap</pre> 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	standard
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 <i>Vol1</i> from snapshot <i>Vol1Snap</i> . # 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 for linear disk groups, or leftover disks. The command will: - Check redundancy data (parity) and correct it for RAID 5, RAID 6, and ADAPT. - Find, but not fix, mirror mismatches for RAID 1 and 10. The system reads both copies of mirror data to find any mismatches. - Find and fix media errors for all RAID levels. Media errors occur when the system cannot read one of the copies of mirror data, due to a disk error such as an unrecoverable disk error (URE). Disk-group scrub can last for multiple hours or longer, 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 <code>show disk-groups</code> 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	standard
Syntax	scrub disk-groups [fix yes no] <disk-groups>
Parameters	[fix yes no] Optional. Specifies whether to automatically fix issues that are found. The default is <i>yes</i> .

	• yes: ◦ Finds and fixes media errors. ◦ For RAID 5, RAID 6, and ADAPT: Finds and fixes parity mismatches by making parity match the data in all cases. ◦ For RAID 1 and RAID 10: Finds and fixes mirror mismatches by copying data from one disk to the other. • no: ◦ For RAID 5 and RAID 6 (not ADAPT): Finds parity mismatches and media errors. ◦ For RAID 1 and RAID 10: Finds parity mismatches, and finds and fixes media errors. <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. With the <code>fix</code> parameter omitted, the default value <code>yes</code> is used and any issues detected are automatically fixed, as described above. <pre># scrub disk-groups dg1</pre> Start scrubbing disk group dg1but do not automatically fix detected errors. <pre># scrub disk-groups dg1 fix no</pre>
See also	abort scrub (with the <code>disk-group</code> parameter) set advanced-settings show disk-groups

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: • Find and fix parity mismatches for RAID 5, RAID 6, and ADAPT. • Find, but not fix, mirror mismatches for RAID 1 and 10. The system reads both copies of mirror data to find any mismatches. • Find and fix media errors for all RAID levels. Media errors occur when the system cannot read one of the copies of mirror data, due to a disk error such as an unrecoverable disk error (URE). 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	standard
Syntax	<pre>scrub volume</pre> <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. <pre># scrub volume vol1</pre>

See also	set advanced-settings abort scrub (with the <code>volume</code> 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	<pre>send support-assist-logs [collect-send collect-send-sync]</pre>
Parameters	<code>collect-send collect-send-sync</code> Specifies how logs are collected and sent. • <code>collect-send</code>: Creates a schedule that runs two minutes later to collect and send logs to the SupportAssist server. This option is the default. • <code>collect-send-sync</code>: Collects and sends logs immediately. This method prevents you from entering additional commands until this command completes—typically three to four minutes.
Examples	Collect and send storage-system log files to the SupportAssist server using the default timing delay. <pre># send support-assist-logs</pre> Send log files immediately to the SupportAssist server. <pre># send support-assist-logs collect-send-sync</pre>
See also	check support-assist-connection check support-assist-updates set support-assist set support-assist-authentication set support-assist-connection set support-assist-contact set support-assist-proxy show support-assist show support-assist-contact show support-assist-telemetry-status

set advanced-settings

Description	Sets advanced system configuration parameters.
Minimum role	standard

Syntax	<pre> set advanced-settings [auto-map enabled disabled on off] [auto-stall-recovery enabled disabled on off] [auto-unmap 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>] [controller-failure enabled disabled on off] [dynamic-spares enabled disabled on off alternate] [emp-poll-rate <rate>] [fan-failure enabled disabled on off] [host-cache-control 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] </pre>
Parameters	<pre> auto-map enabled disabled on off </pre> Optional. Automatically maps initiators or hosts to volumes or volume groups that are mapped to a host group when those initiators or hosts are added to the host group. <pre> auto-stall-recovery enabled disabled on off </pre> 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. <pre> auto-unmap enabled disabled on off </pre> Optional. Automatically unmaps initiators or hosts from volumes or volume groups that are mapped to a host group when those initiators or hosts are removed from the host group. <pre> auto-write-back enabled disabled on off </pre> 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.
- `enabled` or `on`: Background disk-group scrub is enabled.

`background-scrub-interval <interval>`

Optional. Sets the interval in hours between background disk-group scrub finishing and starting again, from 0 to 2160 hours (90 days). The default is 360 hours (15 days).

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

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

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. The dynamic spares feature does not apply to ADAPT disk groups.

- `disabled` or `off`: The dynamic spares feature is disabled.
- `enabled` or `on`: The dynamic spares feature is enabled.
- `alternate`: The dynamic spares feature is enabled but spare selection is restricted to the enclosure that contains the failed disk.

`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`: Hosts can use the SCSI MODE SELECT command to change the write-back cache setting. This is the default.
- `enabled` or `on`: Host control of caching is enabled. Hosts cannot override the storage system's write-back cache setting.

`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).

- `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. If the system is used in a VMware environment, use this option. This option is the default.

`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 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`

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 cache policy will change from write-back to write-through when the temperature exceeds the critical operating range. The actual heat threshold isn't a single fixed number but can be triggered by many different elements within the system, each of which has a different heat threshold.

- `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. <pre># set advanced-settings partner-firmware-upgrade enabled</pre> Enable managed logs. <pre># set advanced-settings managed-logs enabled</pre> Disable auto stall recovery. <pre># set advanced-settings auto-stall-recovery disabled</pre> Enable the auto map feature. <pre># set advanced-settings auto-map on</pre>
See also	add spares remove spares scrub disk-groups show advanced-settings

set alert

Description	Acknowledges specified alerts. Acknowledging a resolved alert will immediately remove that alert from the active list. If you acknowledge an unresolved alert, it will remain in the acknowledged list until it is resolved, at which point it will be deleted.
Minimum role	standard
Syntax	<pre>set alert acknowledge <alert-IDs></pre>
Parameters	acknowledge Acknowledges the specified alerts. <alert-IDs> A comma-separated list of the IDs of alerts to operate on.
Examples	Acknowledge resolved alert 134. <pre># set alert acknowledge 134</pre>
See also	clear alerts show alert-condition-history show alerts

set chap-record

Description	Changes an iSCSI CHAP record. You can change the CHAP record 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 PowerVault Manager documentation.
Minimum role	standard
Syntax	<pre>set chap-record name <originator-name> [secret <originator-secret>] [mutual-name <recipient-name> mutual-secret <recipient-secret>]</pre>
Parameters	<code>name <originator-name></code> The originator name, typically in IQN format. <code>secret <originator-secret></code> 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: " < <code>mutual-name <recipient-name></code> 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. <code>mutual-secret <recipient-secret></code> 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. <pre># 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</pre>
See also	create chap-record delete chap-records show chap-records show iscsi-parameters show ports

set ciphers

Description	Configures a cipher list that the storage system can use to securely communicate with hosts through HTTPS. Transport Layer Security (TLS) is used in every browser worldwide to provide secure HTTP (HTTPS) functionality. TLS 1.2 is the most secure version compared to the previous versions. A cipher suite is a set of algorithms that help secure a network connection that uses TLS. In the TLS handshake, the client communicates the list of cipher suites that it supports to the server. Cipher suites are usually listed from most secure to least secure so that the most secure cipher suite becomes the first choice. The server compares the list of cipher suites that it supports with the list from the client. When the server finds a match, it informs the client and uses the selected cipher suites to establish a secure connection.

	The set of algorithms that cipher suites usually contain include: a key exchange algorithm, a bulk encryption algorithm, and a Message Authentication Code (MAC) algorithm. For example, a typical cipher suite is <code>TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384</code>, where: • <code>TLS</code> indicates the protocol. • <code>ECDHE</code> signifies the key exchange algorithm. • <code>RSA</code> signifies the authentication algorithm. • <code>AES_256_CBC</code> indicates the bulk encryption algorithm. • <code>SHA384</code> indicates the MAC algorithm. The choice of cipher suites in the TLS connection explain the difference between having a secure connection and one that can be exploited. In order to avoid certain attacks, you may need to disable specific ciphers or entire cipher suites due to security issues. Each cipher string can be optionally preceded by <code>!</code>, <code>-</code>, or <code>+</code>: • If <code>!</code> is used then the ciphers are permanently deleted from the list. The ciphers deleted can never reappear in the list even if they are explicitly stated. • If <code>-</code> is used then the ciphers are deleted from the list, but some or all of the ciphers can be added again by later options. • If <code>+</code> is used then the ciphers are moved to the end of the list. This option does not add any new ciphers it just moves matching existing ones. Additionally the cipher string <code>@STRENGTH</code> can be used at any point to sort the current cipher list in order of encryption algorithm key length. The cipher settings apply to both controller modules. If you change the cipher list, the command will prompt you to restart both Management Controllers to activate the ciphers. To restart the Management Controllers, use the following command: <pre>restart mc both full</pre> The change will take effect when the restart is complete.  NOTE: IANA cipher format is not supported.  NOTE: Running the CLI <code>restore defaults</code> command will reset the cipher list to the system default.
Minimum role	manage
Syntax	<pre>set ciphers</pre> <pre>list <cipher-string></pre>
Parameters	<pre>list <cipher-string></pre> One or more ciphers separated by colons (with no spaces). Wildcard characters are not supported.
Examples	Set the cipher list. <pre># set ciphers list ALL:!AES128:!AES256:!SHA256:ECDHE-PSK-CAMELLIA127-SHA256:!ADH:@STRENGTH</pre>
See also	reset ciphers show ciphers

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 CLI port, settings persist across sessions.

	The base, locale, precision, temperature scale, timeout, and units settings are read from the user account, and can be overridden by using this command.
Minimum role	monitor
Syntax	<pre>set cli-parameters [api api-embed console ipa json wbi] [base 2 10] [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]</pre>
Parameters	api api-embed console ipa json wbi Optional. Sets the output mode: • 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. • 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. • 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. 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. 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.

	• <code>enabled</code> or <code>on</code>: Halts output after each full screen to wait for keyboard input. This is the default. • <code>disabled</code> or <code>off</code>: Output is not halted. When displaying output in API format, which is intended for scripting, disable paging. <pre>precision <#></pre> Optional. Sets the number of decimal places (1–10) for display of storage-space sizes. The default is 1. <pre>storage-size-base 2 10</pre> Optional. Alias for <code>base</code>. <pre>storage-size-precision <#></pre> Optional. Alias for <code>precision</code>. <pre>storage-size-units auto MB GB TB</pre> Optional. Alias for <code>units</code>. <pre>temperature-scale celsius c fahrenheit f</pre> Optional. Sets the scale for display of temperature values: • <code>fahrenheit</code> or <code>f</code>: Temperatures are shown in degrees Fahrenheit. • <code>celsius</code> or <code>c</code>: Temperatures are shown in degrees Celsius. This is the default. <pre>timeout <#></pre> 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). <pre>units auto MB GB TB</pre> Optional. Sets the unit for display of storage-space sizes: • <code>auto</code>: Sizes are shown in units determined by the system. This is the default. • <code>MB</code>: Sizes are shown in megabytes. • <code>GB</code>: Sizes are shown in gigabytes. • <code>TB</code>: Sizes are shown in terabytes. Based on the <code>precision</code> 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 <code>units</code> is set to <code>TB</code>, <code>precision</code> is set to 1, and <code>base</code> is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.
Examples	Set CLI parameters. <pre># set cli-parameters timeout 600 console pager off precision 2 units GB temperature-scale f</pre> For scripting, display XML output in <code>api-embed</code> format and disable paging. <pre># set cli-parameters api-embed pager off</pre> For scripting, display brief XML output in <code>api-embed</code> format and disable paging. <pre># set cli-parameters api-embed pager off brief on</pre> Set the CLI to show output in console format. <pre># set cli-parameters console</pre> Set the CLI to show output in JSON format. <pre># set cli-parameters json</pre>
See also	show cli-parameters

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 <code>timestamp</code> parameter and other manual date/time parameters in the same command, the <code>timestamp</code> 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	standard
Syntax	To set the date and time manually: <pre>set controller-date jan feb mar apr may jun jul aug sep oct nov dec day hh:mm:ss year</pre> To set the date and time manually by specifying a timestamp: <pre>set controller-dat timestamp timestamp timezone + -hh[:mm]</pre> To configure use of NTP: <pre>set controller-date ntp enabled disabled on off ntpaddress address timezone + -hh[:mm]</pre>
Parameters	<pre>jan feb mar apr may jun jul aug sep oct nov dec</pre> The month. <pre>day</pre> The day number (1–31). <pre>hh:mm:ss</pre> The hour (0–23), the minutes (0–59), and the seconds (0–59). <pre>year</pre> The year as a four-digit number. <pre>ntp enabled disabled on off</pre> Enables or disables use of NTP. When NTP is enabled and the specified NTP server is available, the time on each controller is synchronized with the server. This is disabled by default. <pre>ntpaddress address</pre> The network address of an available NTP server. The value can be an IPv4 address, IPv6 address, or FQDN. <pre>timezone + -hh[:mm]</pre> The system 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. <pre>timestamp timestamp</pre>

	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 <code>timezone</code> parameter.
Examples	Manually set the system time and date to 1:45 PM on September 22, 2011. <pre># set controller-date sep 22 13:45:0 2011</pre> 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. <pre># set controller-date timestamp 1320273050 timezone -6</pre> Set the system to use NTP with an offset for the Mountain Time zone. <pre># set controller-date ntp enabled ntpaddress 69.10.36.3 timezone -7</pre> Set the system to use NTP with an offset for the Bangalore, India, time zone. <pre># set controller-date ntp enabled ntpaddress 69.10.36.3 timezone +5:30</pre>
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: Repurposing a disk is not permitted when the system is in the <code>Secured</code>, <code>Locked</code> state. Use the <code>show fde-state</code> command to view the system FDE security status. 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	standard
Syntax	<pre>set disk [noprompt] repurpose <disk></pre>
Parameters	<code>noprompt</code> Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction. <code>repurpose</code> Specifies to secure erase the specified disk. <code><disk></code> 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. <pre># set disk 1.2 repurpose</pre>
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	standard
Syntax	<pre>set disk-group [name <new-name>] [owner a b] [scrub-duration-goal hours] [spare-capacity <size>[B KB MB GB TB KiB MiB GiB TiB] default] [spin-down-delay delay] <disk-group></pre>
Parameters	<code>name <new-name></code> Optional. A new name for the disk group. A name that includes a space must be enclosed in double quotes. The name can include printable UTF-8 characters except: " , < \ <code>owner a b</code> 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. <code>scrub-duration-goal hours</code> Optional. The requested duration of a disk-group scrub operation, in hours. A value of 0 indicates that the scrub duration will use the system default scrub setting of 720 hours (30 days). A value of 1 to 1080 hours (45 days) will cause the storage system to adjust the resources available to the scrub operation, which could affect other performance. There is no guarantee that this scrub duration goal is achievable, due to such considerations as disk-group size or abnormally high host activity. <code>spare-capacity <size>[B KB MB GB TB KiB MiB GiB TiB] default</code> Optional. For an ADAPT disk group, this specifies the target spare capacity.  NOTE: If spare capacity is made larger than the default, ADAPT will be degraded. If the spare capacity is made smaller, the user won't be able to revert it back to Default (target and actual capacity are the sum of the largest two disks in the ADAPT disk group) until more disks are added to the ADAPT. • <code>size[B KB MB GB TB KiB MiB GiB TiB]</code>: 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. <code>spin-down-delay <delay></code> 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. NOTE: Drive spin down is not applicable to disks in virtual pools. <code><disk-group></code> 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. <pre># set disk-group name vdg dgA01</pre> Rename linear disk group dg1 to dg2. <pre># set disk-group name dg2 dg1</pre> Rename linear disk group dg1 to dg2 and set its spin-down delay to 10 minutes. <pre># set disk-group name dg2 spin-down-delay 10 dg1</pre>
See also	expand disk-group show disk-groups

set disk-parameters

Description	Sets parameters that affect disk operation.
Minimum role	standard
Syntax	<pre>set disk-parameters [smart enabled disabled on off detect-only] [spin-down enabled disabled on off] [spin-down-delay <delay>]</pre>
Parameters	<code>smart enabled disabled on off detect-only</code> Optional. Sets whether SMART is enabled or disabled for disks: • <code>disabled</code> or <code>off</code>: Disables SMART for all disks in the system and for all disks added to the system. • <code>enabled</code> or <code>on</code>: Enables SMART for all disks in the system and for all disks added to the system. This is the default. • <code>detect-only</code>: Detects but does not change the SMART setting of each disk in the system, and for each new disk added to the system. Disks equipped with Self-Monitoring Analysis and Reporting Technology (SMART) 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. 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. <code>spin-down enabled disabled on off</code> Optional. Sets whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the <code>spin-down-delay</code> parameter. <code>disabled</code> or <code>off</code>: 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. <code>enabled</code> or <code>on</code>: Drive spin down for available disks and global spares is enabled. If the <code>spin-down-delay</code> 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. 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 feature sets spin-down parameters for available disks and global spares. Spin-down settings do not affect leftover disks. <code>spin-down-delay <delay></code> 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. <pre># set disk-parameters smart on spin-down on spin-down-delay 10</pre>
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. A controller configured to use DHCP addressing will send the management hostname to a DHCP server. The DHCP server will in turn register or update the controller's fully qualified domain name (FQDN) on DNS servers. The FQDN is created by appending the management hostname to the DNS domain string that identifies the controller.
Minimum role	standard
Syntax	<pre>set dns-management-hostname [controller a b] [name <hostname>]</pre>
Parameters	<code>controller a b</code> Optional. Specifies whether to change controller A or B, only. If this parameter is omitted, changes affect the controller being accessed. <code>name <hostname></code> A host name to use for a controller. - The name must differ for each controller. - A name can have from 1 to 63 bytes. - A name is not 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. Running the <code>reset dns-management-hostname</code> command will reset the hostname to its default value.
Examples	Set the domain host name for controller A. <pre># set dns-management-hostname controller a name vlan3-ctlra</pre>

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 mysmtppserver.example.com. Further, you could configure search domain example.com and SMTP server mysmtppserver 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	standard
Syntax	<pre>set dns-parameters [controller a b both] nameservers <nameserver-IP-list> [search-domains <domain-name-list>]</pre>
Parameters	<pre>controller a b both]</pre> Optional. Specifies whether to change controller A, B, or both. If this parameter is omitted, changes affect the controller being accessed. <pre>nameservers <nameserver-IP-list></pre> 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. <pre>search-domains <domain-name-list></pre> 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 site1.com, followed by site2.com, and finally by site3.com. <pre># set dns-parameters nameservers 8.8.8.8,8.8.6.6 search-domains site1.com,site2.com,site3.com.</pre>
See also	clear dns-parameters set dns-management-hostname

```

reset dns-management-hostname
show dns-management-hostname
show dns-parameters
show email-parameters

```

set email-parameters

Description	Sets SMTP notification parameters for events and managed logs.
Minimum role	standard
Syntax	<pre> set email-parameters [alert-notification-level all none] domain <domain> email-list <email-addresses> [include-logs enabled disabled on off] [otification-level crit error warn resolved info none] [port <port-number>] security-protocol tls ssl none [sender <sender>] [sender-password <password>] server <address> </pre>
Parameters	alert-notification-level all none Optional. Sets whether the system should send notifications of alerts. - all: Sends notifications for all alerts. This is the default. - none: Disables email notification of alerts. If no notification level is specified, the previous notification level will remain. 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 must follow these rules: - Can have a maximum of 253 characters. - The value cannot include a space or: \ " , ; < > () - Must be in the form: <name>.<TLD> where: <name> can include multiple subdomains separated by periods (.). <TLD> is a valid top-level domain (TLD). - Both are required. - Neither can begin or end with a hyphen (-) or a period (.). For example: MyDomain.com. If the domain name is not valid, some email servers will not process the message. NOTE: Alternatively, you can specify the domain by using a valid IP address enclosed in square brackets, []. If the brackets are omitted, email notifications fail to send. 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 enabled|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. Email notification of alerts will still occur if the `alert-notification-level` parameter is set to `all`.

If no notification level is specified, the previous notification level will remain.

`[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. Valid port numbers are 0-65535.

`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.

`server <address>`

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 <i>logcollector@mydomain.com</i> when logs need to be transferred. <pre># 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</pre>
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	standard
Syntax	<pre>set enclosure [name <new-name>] [location <location>] [rack-number <rack-number>] [rack-position <rack-position>] <enclosure-number></pre>
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>] Optional. 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>] Optional. The number of the rack containing the enclosure, from 0 to 255. [rack-position <rack-position>] Optional. The enclosure's position in the rack, from 0 to 255. <enclosure-number> The enclosure ID.
Examples	Set parameters for enclosure 1. <pre># set enclosure 1 name Storage-5 location Lab rack-number 9 rack- position 3</pre>

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	standard
Syntax	<pre>set fde-import-key [noprompt] passphrase <value></pre>
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: <pre># set fde-import-key passphrase "Customer lock--01/10/2019"</pre> Please re-enter the import passphrase to confirm: "Customer lock--01/10/2019"
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 or unusable. Use the <code>show disks</code> command to check whether any disks have <code>Usage</code> value <code>FAILED</code> or <code>UNUSABLE</code>. In order to set the lock key, all failed disks must be removed from the system. For disks in the <code>UNUSABLE</code> state due to a key mismatch, use the <code>set fde-import-key</code> to unlock these disks and bring them into the system before issuing the <code>set fde-lock-key</code> command. If any disks are in leftover state (<code>Usage</code> value <code>LEFTOVR</code>), the command will proceed and identify the disks that remain in that state.
Minimum role	standard
Syntax	<pre>set fde-lock-key</pre>

	<pre>[current-passphrase <value>] [noprompt] passphrase <value></pre>
Parameters	<pre>[current-passphrase <value>]</pre> 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. <pre>[noprompt]</pre> Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction. <pre>passphrase <value></pre> 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. <pre># set fde-lock-key passphrase "Customer lock--01/10/2014"</pre>
See also	clear fde-keys set fde-import-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	standard
Syntax	<pre>set fde-state [noprompt] [repurpose] [secure passphrase <value>]</pre> Either the repurpose parameter or the secure parameter must be specified.
Parameters	<pre>[noprompt]</pre> Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction. <pre>[repurpose]</pre> 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 <pre>[secure passphrase <value>]</pre> 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. <pre># set fde-state secure passphrase "Customer lock--01/10/2019"</pre> A lost passphrase will result in unrecoverable data loss. Please re-enter the passphrase to confirm: "Customer lock--01/10/2019"
See also	clear fde-keys set fde-import-key set fde-lock-key show fde-state

set host

Description	Sets the name of a host and optionally the profile of the host and the initiators it contains.  NOTE: If your storage configuration has virtual pools greater than 2 PB, use host-side driver settings to increase the host I/O timeout interval (Block Device Timeout) to 80 seconds.
Minimum role	standard
Syntax	set host [name <new-name>] [profile standard] hp-ux openvms <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] hp-ux openvms Optional. • standard: Default profile. • hp-ux: The host uses Flat Space Addressing. • openvms: The host does not allow LUN 0 to be assigned to a mapping.  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 HP-UX. <pre># set host name MyHost profile hp-ux Host1</pre>
See also	show initiators

set host-group

Description	Sets the name of a host group.
Minimum role	standard
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 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. <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. <pre># set host-group name MyHostGroup HostGroup1</pre>
See also	show host-groups

set host-parameters

Description	Sets controller host-port parameters for communication with attached hosts. FC ports support use of qualified 32-Gbit/s or 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 1-Gbit/s, 10-Gbit/s or 25-Gbit/s SFP ports, or 10GBase-T using RJ-45 connectors. 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	standard
Syntax	To set FC port parameters: <pre>set host-parameters [fibre-connection-mode loop point-to-point auto] [fibre-loop-id <values>] [noprompt] [ports <ports> all] [prompt yes no expert] [speed 4g 8g 16g 32g auto]</pre> To set iSCSI port parameters: <pre>set host-parameters [default-router <address>] [gateway <address>] [ip <address>] [iscsi-ip-version ipv4 ipv6] [netmask <address>] [noprompt] [ports <ports> all] [prompt yes no expert]</pre>

Parameters	<code>default-router <address></code> Optional. For iSCSI IPv6 only, the default router for the port IP address. This parameter requires the <code>ports</code> parameter. <code>[fibre-connection-mode loop point-to-point auto]</code> Optional. For FC, sets the topology for the specified ports to: • <code>loop</code>: Fibre Channel-Arbitrated Loop (public or private). Loop mode cannot be used with 16-Gbit/s link speed. • <code>point-to-point</code>: Fibre Channel point-to-point. This is the default. • <code>auto</code>: Automatically sets the mode based on the detected connection type You must also specify the <code>ports</code> parameter. <code>[fibre-loop-id <values>]</code> 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 <code>ports</code> 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. • <code>soft</code> or <code>255</code>: 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. • <code>0-125</code>: 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. <code>[gateway <address>]</code> Optional. For iSCSI, the port gateway address. This parameter requires the <code>ports</code> parameter. <code>[ip <address>]</code> 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 <code>ports</code> parameter. <code>[iscsi-ip-version ipv4 ipv6]</code> 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: • <code>ipv4</code>: 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. • <code>ipv6</code>: 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 If you specify this parameter, also specify the <code>ip</code> parameter. <code>[netmask <address>]</code> Optional. For iSCSI IPv4 only, the subnet mask for the port IP address. This parameter requires the <code>ports</code> parameter. <code>[noprompt]</code> Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction. <code>[ports <ports> all]</code> Optional. Specific host port numbers or all ports. For port syntax, see Command syntax <code>[prompt yes no expert]</code> Optional. For scripting, this specifies an automatic reply to confirmation prompts: • <code>yes</code>: Allow the command to proceed.

	• <code>no</code>: Cancel the command. • <code>expert</code>: Allow the command to proceed If this parameter is omitted, you must manually reply to prompts <code>speed 4g 8g 16g 32g auto</code> Optional. For FC, sets a forced link speed in Gbit/s or lets the speed be auto-negotiated (<code>auto</code>). 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. This parameter requires the <code>ports</code> parameter.
Examples	On a system with FC ports, set the link speed to 8 Gbit/s for ports A1 and B1. <pre># set host-parameters speed 8g ports a1,b1</pre> On a system with FC ports, set the link speed to auto for ports A1 and B1 and suppress the confirmation prompt. <pre># set host-parameters speed auto ports a1,b1 noprompt</pre> On a system with iSCSI ports using IPv4 addressing, change the IP address of port A3. <pre># set host-parameters ip 10.134.50.6 ports a3</pre> On a system with iSCSI ports, specify to use IPv6 addressing and change the IP address and default router for port A1. <pre># set host-parameters ports A1 iscsi-ip-version ipv6 ip ::8576:246a default-router ::0a0a:</pre> On a system with SAS ports, suppress confirmation prompts. <pre># set host-parameters noprompt</pre>
See also	restart mc restart sc set iscsi-parameters show ports

set initiator

Description	Sets the name of an initiator and optionally its profile.
Minimum role	standard
Syntax	<pre>set initiator id <initiator> [nickname <name>] [profile standard hp-ux openvms]</pre>
Parameters	<code>id <initiator></code> 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. <code>[nickname <name>]</code> 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. <code>[profile standard hp-ux openvms]</code>

	Optional. • <code>standard</code>: Default profile. • <code>hp-ux</code>: The host uses Flat Space Addressing. • <code>openvms</code>: The host does not allow LUN 0 to be assigned to a mapping.  CAUTION: Changing this parameter can disrupt access from connected initiators.
Examples	For FC initiator 21000024ff3dfed1, set its name to <code>FC-port1</code> and profile to <code>OpenVMS</code>. <pre># set initiator id 21000024ff3dfed1 nickname FC-port1 profile openvms</pre> For SAS initiator 21000024ff3dfed1, set its name to <code>SAS-port1</code> and profile to <code>HP-UX</code>. <pre># set initiator id 21000024ff3dfed1 nickname SAS-port1 profile hp-ux</pre> For iSCSI initiator <code>iqn.1991-05.com.microsoft:myhost.domain</code>, set its name to <code>iSCSI-port1</code> and profile to <code>standard</code>. <pre># set initiator id iqn.1991-05.com.microsoft:myhost.domain nickname iSCSI-port1 profile standard</pre>
See also	show initiators

set ipv6-network-parameters

Description	Sets IPv6 parameters for the network port in each controller module.
Minimum role	standard
Syntax	<pre>set ipv6-network-parameters [autoconfig enabled disabled on off] [controller a b both] [gateway <gateway>] [reset-link]</pre>
Parameters	 NOTE: At minimum, <code>autoconfig</code> or <code>gateway</code> must be specified. <pre>[autoconfig enabled disabled on off]</pre> Optional. • <code>enabled</code> or <code>on</code>: Specifies to use an automated method (either DHCPv6 or SLAAC, as defined by the network configuration) to automatically configure the address. If a DHCPv6 address is available, DHCPv6 will provide an interface address. If DHCPv6 cannot provide an address, the SLAAC address will be the single interface address. This is the default. • <code>disabled</code> or <code>off</code>: Specifies 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 <code>autoconfig</code> 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 <code>autoconfig</code> is subsequently disabled. <pre>[controller a b both]</pre> Optional. Specifies whether to change controller A, B, or both. If this parameter is omitted, changes affect both controllers. <pre>[gateway <gateway>]</pre> Optional. Specifies a gateway IP address for the port. The value must be a valid IPv6 address. The value cannot include a <code>prefix</code> or <code>/prefixLength</code> notation. The address cannot be used elsewhere in the network port configuration. All addresses share a single gateway. <pre>reset-link</pre>

	Optional. Returns network port addressing to the default settings. This parameter runs only on the local controller and cannot run with any other parameter. Allow up to two minutes for the operation to complete.
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 set network-parameters 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 may disrupt access from connected hosts.
Minimum role	standard
Syntax	<pre>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-frames enabled disabled on off] [speed auto 1gbps]</pre>
Parameters	<pre>[chap enabled disabled on off]</pre> 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 <pre>[iscsi-ip-version ipv4 ipv6]</pre> 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. <pre>[isns enabled disabled on off]</pre> Optional. Enables or disables registration with a specified Internet Storage Name Service server, which provides name-to-IP-address mapping. Disabled by default. <pre>[isns-alt-ip <iSNS-IP>]</pre> Optional. Specifies the IP address of an alternate iSNS server, which can be on a different subnet. The default address is all zeroes.

	<pre>[isns-ip <iSNS-IP>]</pre> Optional. Specifies the IP address of an iSNS server. The default address is all zeroes. <pre>[jumbo-frame enabled disabled on off]</pre> 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 <pre>[speed auto 1gbps]</pre> Sets the host port link speed. • <code>auto</code>: Auto-negotiates the proper speed. This is the default. • <code>1gbps</code>: 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. <pre># set iscsi-parameters chap enabled isns enabled isns-ip 10.10.10.93 isns-alt-ip 10.11.10.90</pre> Specify that iSCSI ports will use IPv6 addressing. <pre># set iscsi-parameters iscsi-ip-version ipv6</pre>
See also	set host-parameters show iscsi-parameters

set ldap-parameters

Description	Configures the LDAP server parameters required to authenticate and authorize LDAP users. All unsecured protocols and services must be disabled before the LDAP feature can be enabled. Only secure protocols can be enabled while LDAP is enabled. NOTE: The command does not query specified LDAP servers to ensure that they can be reached. If the server cannot be reached, the user verification will fail. NOTE: Running the <code>restore defaults</code> command will clear the LDAP configuration and other settings. For more information about restoring defaults, see Settings changed by restore defaults. For more information about the LDAP feature, see the <i>Dell PowerVault ME5 Series Administrator's Guide</i>.
Minimum role	manage
Syntax	<pre>set ldap-parameters [alt-port <port-number>] [alt-server <server-address>] ldap enabled disabled on off [port <port-number>] [server <server-address>] [user-search-base <search-string>]</pre>
Parameters	<pre>alt-port <port-number></pre> Optional. Specifies the port to use for communication with the alternate LDAP server. The value can be any valid port in the range 1–65535. The standard ports are 389 and 636. The default is 636.

	<pre>alt-server <server-address></pre> Optional. Specifies the network address of the alternate LDAP server. The value can be an IPv4 address, IPv6 address, or FQDN. This server will listen on the port specified by the <code>alt-port</code> parameter. The <code>alt-server</code> and <code>server</code> parameters cannot be set to the same value. <pre>ldap enabled disabled on off</pre> Enables or disables use of LDAP. Disabled by default. If you enable this parameter you must specify the <code>server</code>, <code>port</code>, and <code>user-search-base</code> parameters. <pre>port <port-number></pre> Optional. Specifies the port to use for communication with the primary LDAP server. The value can be any valid port in the range 1-65535. The standard ports are 389 and 636. The default is 636. <pre>server <server-address></pre> Required if the <code>ldap</code> parameter is enabled; otherwise optional. Specifies the network address of the primary LDAP server. The value can be an IPv4 address, IPv6 address, or FQDN. This server will listen on the port specified by the <code>port</code> parameter. The <code>server</code> and <code>alt-server</code> parameters cannot be set to the same value. <pre>user-search-base <search-string></pre> Required if the <code>ldap</code> parameter is enabled; otherwise optional. Specifies where to start searching for users in the LDAP directory tree. The search string can include the following attributes, separated by commas: • <code>cn=<common-name></code> • <code>ou=<organizational-unit></code> • <code>o=<organization></code> • <code>c=<country></code> • <code>dc=<domain></code> For more information about LDAP name format, see: https://msdn.microsoft.com/en-us/library/aa366101(v=vs.85).aspx
Examples	Configure the client to connect to the primary LDAP server, and to an alternate LDAP server in case the primary connection fails. The <code>user-search-base</code> setting defines the domain and organizational unit. <pre># set ldap-parameters ldap enabled server 10.235.217.52 port 389 alt-server 10.235.217.51 alt-port 636 user-search-base ou=colo,dc=bigco2,dc=com,dc=local</pre> Disable LDAP. <pre># set ldap-parameters ldap off</pre>
See also	show ldap-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	standard
Syntax	To set a disk LED: <pre>set led disk <ID> enable disable on off</pre> To set the LEDs for an enclosure and its I/O modules: <pre>set led</pre>

	<pre>[controller a b] enable disable on off enclosure <ID></pre>
Parameters	<pre>[controller a b]</pre> 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. <pre>disk <ID></pre> Specifies the disk to locate. For disk syntax, see Command syntax. This overrides the fault LED on the disk. <pre>enable disable on off</pre> Specifies to turn the LED on or off. <pre>enclosure <ID></pre> Specifies the enclosure to locate. This affects the identification LED on the enclosure and on each I/O module.
Examples	<pre>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</pre>

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 <code>set ipv6-network-parameters</code> 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: 10.0.0.1 169.254.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	standard
Syntax	<pre>set network-parameters [controller a b both] [dhcp] [gateway <gateway>] [ip <address>] [netmask <netmask>] [ping-broadcast enabled disabled on off] [reset-link]</pre>
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. reset-link Optional. Returns network port addressing to the default settings. This parameter runs only on the local controller and cannot run with any other parameter. Allow up to two minutes for the operation to complete.
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. <pre># 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</pre>
See also	set ipv6-network-parameters 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	standard
Syntax	<pre>set ntp-parameters [ntp enabled disabled on off] [ntpaddress <address>] [timezone + -hh[:mm]]</pre>
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. <pre># set ntp-parameters ntp enabled ntpaddress 69.10.36.3 timezone -7</pre> Set the system to use NTP with an offset for the Bangalore, India, time zone. <pre># set ntp-parameters ntp enabled ntpaddress 69.10.36.3 timezone +5:30</pre>
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	<pre>set password [password <password>] [<user>]</pre>
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. <pre># set password LabAdmin</pre> Enter new password: ***** Re-enter new password: ***** Change the password for a user named JDoe. <pre># set password JDoe password Abcd_1234</pre>
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	standard
Syntax	<pre>set peer-connection [name <new-name>] [remote-password <password>] [remote-port-address <remote-port-address>] remote-username <i>username</i> <peer-connection-ID></pre>
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. <pre>[remote-password <password>]</pre> Optional in console mode; required for API mode. 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. <pre>[remote-port-address <remote-port-address>]</pre> 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. <pre>remote-username <username></pre> 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. The user must be a local user on the remote system, not an LDAP user. <pre><peer-connection-ID></pre> Specifies the name or serial number of the peer connection to modify.
Examples	Connect the current peer connection <code>Peer1</code> to the remote system's new IP address, <code>192.168.202.22</code>, using the credentials of remote user <code>John</code>. <pre># set peer-connection remote-port-address 192.168.202.22 remote-username John remote-password John1234 Peer1</pre> Rename <code>Peer1</code> to <code>PeerCon1</code>. <pre># set peer-connection name PeerCon1 remote-username John remote-password John1234 Peer1</pre>
See also	create peer-connection delete peer-connection query peer-connection show peer-connections

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. 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 Storage panel.
Minimum role	standard
Syntax	<pre>set pool [low-threshold <#>%] [middle-threshold <#>%] [overcommit enabled disabled on off] pool</pre>
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 and must be a whole number.. 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 and must be a whole number. The default middle-threshold value is 75%. [overcommit enabled disabled on off] Optional. - enabled or on: The pool will use thin provisioning, which means that more capacity can be allocated to volumes than physically exists in 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 pool will use full provisioning, which means that the capacity allocated to volumes when they are created 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%. <pre># set pool low-threshold 30% A</pre> For pool B, disable overcommit. <pre># set pool overcommit off B</pre>
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	monitor
Syntax	<pre>set prompt <prompt></pre>
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 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. <pre># set prompt "CLI\$ "</pre> Success: Command completed successfully. (2014-07-17 16:44:25) <pre>CLI\$ show ...</pre>

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	<pre>set protocols [debug enabled disabled on off] [debug-response <response-message>] [ftp enabled disabled on off] [http enabled disabled on off] [https enabled disabled on off] [sftp enabled disabled on off] [sftp-port <port>] [slp enabled disabled on off] [snmp enabled disabled on off] [ssh enabled disabled on off] [ssh-port <port>] [telnet enabled disabled on off]</pre>
Parameters	<code>debug enabled disabled on off</code> Optional. Enables or disables debug capabilities, including Telnet debug ports and privileged diagnostic user IDs. This is disabled by default. You cannot enable this mechanism if LDAP is enabled. For security, attempting to enable this parameter causes the controller to create a challenge message. The challenge message includes the controller serial number and a challenge string. You must email the challenge message to technical support for authorization. If authorization is granted, a response message is returned. The response message is a password string that expires 5 minutes after it is generated and can be used only one time. Use the <code>debug-response</code> parameter to submit the response message to the controller, which enables the debug protocol. The debug protocol remains enabled for 15 minutes to allow you to log in to a debug port. Login sessions started during that time will remain open indefinitely until logout or a system restart.  NOTE: Properly shut down the debug console by entering the command <code>set protocols debug disabled</code>. Do not just close the console directly or by using the exit command. <code>debug-response <response-message></code> Optional. Submits the content of the debug authorization response message, received after successful use of the debug parameter, to the controller to enable the debug protocol. <code>ftp enabled disabled on off</code> Optional. Enables or disables File Transfer Protocol (FTP), an interface for installing firmware updates, installing security certificates and keys, and downloading logs. This is by default. Using SFTP is preferred. You cannot enable this mechanism if LDAP is enabled.

	<code>http enabled disabled on off</code> Optional. Enables or disables the standard PowerVault Manager web server. This is disabled by default. You cannot enable this mechanism if LDAP is enabled. <code>https enabled disabled on off</code> Optional. Enables or disables the secure PowerVault Manager web server. This is enabled by default. <code>[sftp enabled disabled on off]</code> Optional. Enables or disables SSH File Transfer Protocol (SFTP), a secure 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 <code>sftp-port</code> and <code>ssh-port</code> parameters, respectively. The port numbers must differ <code>[sftp-port <port>]</code> Optional. Specifies the port number to use for SFTP. The default is 1022. <code>[slp enabled disabled on off]</code> 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. <code>[snmp enabled disabled on off]</code> 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. <code>[ssh enabled disabled on off]</code> Optional. Enables or disables the secure shell CLI. This is enabled by default. <code>[ssh-port <port>]</code> Optional. Specifies the port number to use for SSH. The default is 22. <code>[telnet enabled disabled on off]</code> Optional. Enables or disables the standard CLI. This is disabled by default. You cannot enable this mechanism if LDAP is enabled.
Examples	Disable unsecure HTTP connections and enable FTP. <pre># set protocols http disabled ftp enabled</pre> Enable Telnet, which is an unsecured protocol. <pre># set protocols telnet enabled</pre> Enable SFTP and set it to use port 2020. <pre># set protocols sftp enabled sftp-port 2020</pre>
See also	set cli-parameters show protocols

set remote-system

Description	Changes remote-system credentials stored in the local system. Do this when the user name or password to access a remote system has been changed in that system.
Minimum role	standard
Syntax	<pre>set remote-system password <password></pre>

	<pre>username <username> <IP-address></pre>
Parameters	<pre>password <password></pre> Optional. The new password to access the remote system. The value is displayed in clear text. <pre>username <username></pre> Optional. The new username to access the remote system. <pre><IP-address></pre> The name or network-port IP address of the remote system. A name that includes a space must be enclosed in double quotes. An address can be an IPv4 address, IPv6 address, or FQDN.
Examples	Set the password Abcd_1234 for remote system System2. <pre># set remote-system password Abcd_1234 System2</pre>
See also	create remote-system delete remote-system remote show remote-systems

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	standard
Syntax	<pre>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</pre>
Parameters	<pre>[name <new-name>]</pre> 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. <pre>[queue-policy discard queue-latest]</pre> 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 1-24 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. <code>current-replication-set-ID</code> Specifies the current name or serial number of the replication set for which to change the name.
Examples	Rename the replication set <code>Rep1</code> to <code>RepSet1</code>. <pre># set replication-set name RepSet1 Rep1</pre> Change the replication set <code>RepSet1</code> queue policy to discard a new replication request when a replication is running. <pre># set replication-set queue-policy discard RepSet1</pre> For replication set <code>RepSet1</code> with primary volume <code>Data</code>, enable snapshot history for the secondary volume only, allowing up to 10 replication snapshots with the basename <code>repsnapData</code> to be retained for that volume. <pre># set replication-set snapshot-history secondary snapshot-basename repsnapData snapshot-count 10 RepSet1</pre>
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	standard
Syntax	<pre>set schedule [schedule-specification "<specification>"] [task-name <task-name>] <schedule-name></pre>
Parameters	<code>[schedule-specification "<specification>"]</code> 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. <code>start yyyy-mm-dd hh:mm [AM PM]</code> 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. <code>[every # minutes hours days weeks months years]</code> 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. • <code>[between hh:mm [AM PM] and hh:mm [AM PM]]</code> Constrains the time range during which the task is permitted to run. Ensure that the start time is within the specified time range. • <code>[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]</code> Constrains the days or months when the task is permitted to run. Ensure that this constraint includes the start date • <code>[count #]</code> Constrains the number of times the task is permitted to run • <code>[expires yyyy-mm-dd hh:mm [AM PM]]</code> Specifies when the schedule expires, after which the task will no longer run • <code>[task-name <task-name>]</code> Optional. The name of an existing task to run. A name that includes a space must be enclosed in double quotes. • <code><schedule-name></code> 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. <pre># set schedule schedule-specification "start 2019-01-01 00:01 every 1 days expires 2019-12-31 00:01" task-name Task1 Sched1</pre>
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	standard

Syntax	<pre>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</pre>
Parameters	<pre>[high-threshold <percent-of-snap-space>%]</pre> 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. <pre>[limit <percent-of-pool>%]</pre> Optional. Specifies the snapshot space. Enter a value from 1% to 100%. The default is 10%. <pre>[limit-policy notify-only delete]</pre> Optional. Specifies the limit policy for when the percentage of the pool designated for snapshots is reached. • <code>notify-only</code>: When the snapshot space is reached an event is generated and logged. This is the default. • <code>delete</code>: When the snapshot space is reached an event is generated and logged and automatic deletion of snapshots occurs. <pre>[low-threshold <percent-of-snap-space>%]</pre> 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. <pre>[middle-threshold <percent-of-snap-space>%]</pre> 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 <pre>. pool A B</pre> 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. <pre># set snapshot-space pool A limit 15% middle-threshold 85% limit-policy delete</pre>
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	standard
Syntax	<pre>set snmp-parameters [alert-notification-level all none] [add-trap-host <address>]</pre>

	<pre>[del-trap-host <address>] [enable crit error warn resolved info none] [read-community <string>] [trap-host-list <trap-host-list>] [write-community <string>]</pre>
Parameters	<pre>[add-trap-host <address>]</pre> 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. <pre>alert-notification-level all none</pre> Optional. Enables or disables SNMP notification of alerts. • all: The system will send SNMP notifications for alerts. This setting is the default. • none: The system will not send SNMP notifications for alerts. If this parameter is omitted, the previous notification level remains. <pre>[del-trap-host <address>]</pre> Optional. Specifies the network address of a destination host to delete. The value can be an IPv4 address, IPv6 address, or FQDN. <pre>[enable crit error warn resolved info none]</pre> 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. <pre>[read-community <string>]</pre> Optional. Sets a community string for read-only access. 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. <pre>[trap-host-list <trap-host-list>]</pre> Optional. Replaces the current list of trap destinations.. Each value can be an IPv4 address, IPv6 address, or FQDN. <pre>[write-community <string>]</pre> 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 except: " <> • A value that includes a space must be enclosed in double quotes.
Examples	Enable Critical events only, specify a trap host, and set the community string for read-only access. <pre># set snmp-parameters enable crit add-trap-host 172.22.4.171 read-community public</pre>
See also	set protocols show snmp-parameters

`test` (with the `snmp` parameter)

set support-assist

Description	Sets parameters for the SupportAssist feature.  NOTE: Before you can enable SupportAssist, you must review the EULA by executing <code>show support-assist</code> with the <code>eula</code> parameter: <code># show support-assist eula</code> When you enable SupportAssist for the first time, the CLI presents a confirmation to ensure you have reviewed and accept the EULA. The agreement allows remote monitoring of the storage system, collection of diagnostic information, and transmission of that data to a remote support server. Reply <code>yes</code> to enable the support service or <code>no</code> to leave it disabled. After enabling the service, use the <code>set support-assist-connection</code> command to establish connectivity to the SupportAssist server, then use the <code>set support-assist-contact</code> command to enter customer information.
Minimum role	standard
Syntax	<pre>set support-assist [auto-case enabled disabled on off] [apex-aiops-observability enabled disabled on off] [maintenance-mode enabled disabled on off] [enabled disabled on off]</pre>
Parameters	You must specify one parameter at a time. This command does not accept multiple parameters. <code>auto-case enabled disabled on off</code> Optional. Allows the Dell support server to automatically create support cases when certain error conditions occur on the system. • <code>enabled</code> or <code>on</code>: Enables automatic case creation. This is the default. • <code>disabled</code> or <code>off</code>: Disables automatic case creation. <code>apex-aiops-observability enabled disabled on off</code> Optional. Specifies whether the APEX AIOps Infrastructure Observability feature is used. This feature sends additional configuration and performance metrics to the Dell support server for regular predictive analysis. • <code>enabled</code> or <code>on</code>: Enables APEX AIOps Infrastructure Observability. This is the default. • <code>disabled</code> or <code>off</code>: Disables APEX AIOps Infrastructure Observability. <code>maintenance-mode [enabled disabled on off]</code> Optional. Puts the system into maintenance mode to notify SupportAssist not to create support tickets during planned system downtime. • <code>enabled</code> or <code>on</code> – Enables maintenance mode. • <code>disabled</code> or <code>off</code> – Disables maintenance mode. This is the default. <code>[enabled disabled on off]</code> Optional. • <code>enabled</code> or <code>on</code> – Enables the SupportAssist feature. • <code>disabled</code> or <code>off</code> – Disables the SupportAssist feature
Examples	Enable the SupportAssist feature. <pre># set support-assist enable</pre> To use SupportAssist you must run <code>"show support-assist eula"</code> and read the EULA. <pre>Do you accept the EULA? [y/n] y</pre>

	Enable automatic case creation on the SupportAssist service. Temporarily suspend the SupportAssist service. <pre># set support-assist state pause</pre> Put the system into maintenance mode. <pre># set support-assist maintenance-mode on</pre>
See also	check support-assist-connection check support-assist-updates send support-assist-logs set support-assist-authentication set support-assist-connection set support-assist-contact set support-assist-proxy show support-assist show support-assist-contact show support-assist-telemetry-status

set support-assist-authentication

Description	Authenticates the storage system to use SupportAssist functionality. The command fetches keys and certificates from the Dell support server based on the provided access key and PIN. Use this command to authenticate your system or to refresh your secure connection to SupportAssist by entering a new access key and PIN.  NOTE: The access key and PIN must be created through the Dell support portal.
Minimum role	standard
Syntax	<pre>set support-assist-authentication access-key <key> pin <pin></pre>
Parameters	access-key <key> The access key obtained from the Dell support portal. pin <pin> The PIN generated after entering product details on the Dell support portal.
Examples	Provide the access key and PIN to authenticate to the SupportAssist portal. <pre># set support-assist-authentication access-key <key> pin <pin></pre>
See also	check support-assist-connection check support-assist-updates send support-assist-logs set support-assist set support-assist-connection set support-assist-contact set support-assist-proxy show support-assist

	show support-assist-contact show support-assist-telemetry-status

set support-assist-connection

Description	Set connection preferences to the SupportAssist server.
Minimum role	standard
Syntax	<pre>set support-assist-connection [connection-preference direct gateway] [gateway-urls <URL-list>]</pre>
Parameters	At least one parameter must be specified. <code>connection-preference direct gateway</code> Optional. Specifies the method of connection. • <code>direct</code>: Connect directly to the SupportAssist server. This option is the default. • <code>gateway</code>: Connect to SupportAssist through a gateway server. You must provide at least one gateway URL to use this option. <code>[gateway-urls <URL-list>]</code> Optional. A comma-separated list of up to three URLs to use as gateway servers. You must supply at least one URL. Configure multiple gateway servers for connection redundancy.
Examples	Specify using direct connections for SupportAssist communication. <pre># set support-assist-connection connection-preference direct</pre> Specify using a gateway connection for SupportAssist communication and supply two gateway URLs. <pre># set support-assist-connection connection-preference gateway gateway- urls https://example1.com,https://example2.com</pre>
See also	check support-assist-connection check support-assist-updates send support-assist-logs set support-assist set support-assist-contact set support-assist-proxy show support-assist show support-assist-contact show support-assist-telemetry-status

set support-assist-contact

Description	Add or update information for users that serve as contacts for support issues. Provide information for one or two contacts, which are designated as primary and secondary. This information is used to identify who receives automatically generated email notifications and who support personnel should contact when processing service request cases.
Minimum role	standard
Syntax	<pre>set support-assist-contact</pre>

	<pre>[email-address <address>] [first-name <name>] [last-name <name>] [phone-number <number>] [preferred-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] primary secondary</pre>
Parameters	 NOTE: To clear a value from any of these parameters, set it to null by entering a value of " ". For example: set support-assist-contact primary first-name " " <pre>email-address <address></pre> Optional. Email address of the contact. Input rules: • Must be a valid email address in the form <name>@<host>.<domain> where: ◦ <name> is a string that can include uppercase and lowercase characters, numbers, and symbol characters: . - % ◦ The <name> segment is followed by a single @ symbol. ◦ <host> is a string that can include uppercase and lowercase characters, numbers, and symbol characters: . - ◦ The <host> segment cannot end with a period and cannot include multiple periods in a row. ◦ A single period is used between the <host> segment and the <domain> segment. ◦ <domain> is a string that can include uppercase and lowercase characters and numbers. • The value can have a maximum of 100 bytes. <pre>first-name <name></pre> Optional. First name of the contact. Input rules: • The value can include printable UTF-8 characters, except as noted below. • The value cannot include spaces or symbol characters except: - . ' " • The value can have a maximum of 50 bytes. <pre>last-name <name></pre> Optional. Last name of the contact. Input rules: • The value can include printable UTF-8 characters, except as noted below. • The value cannot include spaces or symbol characters except: - . ' " • The value can have a maximum of 50 bytes. <pre>phone-number <number></pre> Optional. Phone number of the contact. Input rules: • Include only numbers or optionally use standard phone number separators: () - + • Spaces are not allowed. • For extensions, use a single X (uppercase or lowercase) to introduce. • The value must be between 9 and 40 bytes. <pre>preferred-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</pre> Optional. The preferred language for support personnel to use for communications to this contact. <pre>primary secondary</pre> Designates whether the information provided is for the primary or secondary contact.
Examples	Update the name for a primary contact person. <pre># set support-assist-contact primary first-name Roger last-name Rabbit</pre> Add an email address for a secondary contact person. <pre># set support-assist-contact secondary email-address alice@example.com</pre>
See also	check support-assist-connection check support-assist-updates

	send support-assist-logs set support-assist set support-assist-authentication set support-assist-connection set support-assist-proxy show support-assist show support-assist-contact show support-assist-telemetry-status

set support-assist-proxy

Description	Configures proxy server details for communication with the Dell support server or a user-defined gateway server. Use this command to enable or disable the proxy and to set configuration details such as connection protocol, host, and port for communication.
Minimum role	standard
Syntax	<pre>set support-assist-proxy [host <IP-or-name>] [password <proxy-password>] [port <port>] [protocol http https] [user <proxy-user>] [enabled disabled on off]</pre>
Parameters	At minimum the host and port parameters must be specified when you enable this feature the first time. <pre>[host <IP-or-name>]</pre> Optional. Specifies the IP address or name of a proxy host. <pre>password <proxy-password></pre> Optional. Specifies the proxy password to use to access the proxy host. <pre>[port <port>]</pre> Optional. Specifies the port number to use on the proxy host. <pre>protocol HTTP</pre> Optional. Specifies the communication protocol. Only HTTP is supported. <pre>[user <proxy-user>]</pre> Optional. Specifies the proxy user name to use to access the proxy server. <pre>enabled disabled on off</pre> Specifies whether communication is via a proxy. • enabled or on – Communication is via a proxy. • disabled or off – No proxy is used.
Examples	Enable SupportAssist communication via the proxy server. <pre># set support-assist-proxy enable host 10.2.2.2 port 1234</pre>
See also	check support-assist-connection check support-assist-updates

	send support-assist-logs set support-assist set support-assist-authentication set support-assist-connection set support-assist-contact show support-assist show support-assist-contact show support-assist-telemetry-status

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	standard
Syntax	<pre>set syslog-parameters [alert-notification-level all none] [host <address>] [host-ip <address>] [host-port <port-number>] notification-level crit error warn resolved info none</pre>
Parameters	<pre>[alert-notification-level all none]</pre> Optional. Enables or disables syslog notification of alerts. - all: The system will send syslog notifications for alerts. This is the default. - none: The system will not send syslog notifications for alerts. If this parameter is omitted, the previous notification level will remain. <pre>[host <address>]</pre> Optional. The network address for the host. The value can be an IPv4 address, IPv6 address, or FQDN. If <code>notification-level</code> is other than <code>none</code>, the <code>host</code> parameter must be specified. <pre>[host-ip <address>]</pre> Deprecated—use the <code>host</code> parameter instead. <pre>[host-port <port-number>]</pre> Optional. A specific port number on the host. The allowed port numbers are 1-65535. <pre>notification-level crit error warn resolved info none</pre> 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 <code>notification-level</code> is other than <code>none</code>, the <code>host</code> parameter must be specified.

Examples	Set the system to send an entry to the remote server at <code>10.1.1.10</code> on port <code>514</code> when a critical event occurs. <pre># set syslog-parameters notification-level crit host 10.1.1.10 host-port 514</pre>
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	standard
Syntax	<pre>set system [contact <value>] [info <value>] [location <value>] [name <value>]</pre>
Parameters	<code>[contact <value>]</code> Optional. The name of the person who administers the system. The default is <code>Uninitialized Contact</code>. <code>[info <value>]</code> Optional. A brief description of what the system is used for or how it is configured. The default is <code>Uninitialized Info</code>. <code>[location <value>]</code> Optional. The location of the system. The default is <code>Uninitialized Location</code>. <code>[name <value>]</code> Optional. A name to identify the system. The default is <code>Uninitialized Name</code>.
Examples	Set the system name to <code>Test</code> and the contact to <code>J. Doe</code>. <pre># set system name Test contact "J. Doe"</pre>
See also	show system

set task

Description	Changes parameters for a <code>TakeSnapshot</code> . 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	standard
Syntax	<pre>set task [<code>last-snapshot</code> <code>enabled disabled on off</code>] [<code>replication-set</code> <code><replication-set-ID></code>] [<code>retention-count</code> <code><#></code>] [<code>snapshot-prefix</code> <code><prefix></code>] <name></pre>
Parameters	<code>last-snapshot</code> <code>enabled disabled on off</code> Optional. For a Replicate task this specifies to replicate the most recent snapshot of the primary volume. At the time the scheduled replication occurs, the snapshot must exist. This snapshot may have been created either manually or by a host-initiated snapshot creation. If <code>last-snapshot</code> is specified and no snapshot exists for the volume when the scheduled replication begins, the system generates an error and the replication fails. <code>replication-set</code> <code><replication-set-ID></code> Optional. For a Replicate task this specifies the ID of the replication set to replicate. [<code>retention-count</code> <code><#></code>] Optional. For a TakeSnapshot task this specifies the number of snapshots created by this task to retain, from 1 to 16. When a new snapshot exceeds this limit, the oldest snapshot is reset and renamed with the same prefix. The oldest snapshot is the one whose name has the lowest number (such as 01 as compared with 02). Resetting the oldest snapshot does not change its creation date/time. If you reduce the retention count for a task, excess snapshots will be removed the next time the task runs. [<code>snapshot-prefix</code> <code><prefix></code>] 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 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. <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. <pre># set task snapshot-prefix DG1v1 retention-count 2 Snap</pre>
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	<pre>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 <IP-address>] [trap-port <port-number>] [type novice standard advanced diagnostic] [units auto MB GB TB] <name></pre>
Parameters	<pre>[authentication-type MD5 SHA none]</pre> Optional. For an SNMPv3 user, this specifies whether to use a security authentication protocol. This parameter requires the <code>password</code> parameter and the <code>trap-host</code> parameter. - MD5: MD5 authentication. This is the default. - SHA: SHA-1 authentication. - none: No authentication. <pre>[base 2 10]</pre> 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. To remove FTP access, disable FTP
- `snmpuser`: Allows an SNMPv3 user to view the SNMP MIB and receive SNMP trap notifications. This option requires the `trap-host` parameter. To use a trap destination port other than the default port, also specify the `trap-port` parameter.
- `none`: No interfaces.

A command that specifies `snmpuser` 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 mode; required for API mode. Sets a new password for the user.

- 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.

[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.
- `standard`: User can view and change system settings except: configuring local users; configuring LDAP; performing write operations through FTP or SFTP; performing file uploads from the PowerVault Manager; using the restore defaults command.
- `manage`: User can view and change system settings.
- `diagnostic`: For use by or with direction from technical support.

	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. <code>[session-preferences]</code> Optional. Specifies that the current CLI settings will become permanent settings for the user. This parameter cannot be combined with any other parameter. <code>[storage-size-base 2 10]</code> Optional. Alias for base. <code>[storage-size-precision <#>]</code> Optional. Alias for precision. <code>[storage-size-units auto MB GB TB]</code> Optional. Alias for units. <code>[temperature-scale celsius c fahrenheit f]</code> Optional. Sets the scale for display of temperature values: • <code>fahrenheit</code> or <code>f</code>: Temperatures are shown in degrees Fahrenheit. • <code>celsius</code> or <code>c</code>: Temperatures are shown in degrees Celsius. This is the default. <code>[timeout <#>]</code> 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). <code>[trap-host <address>]</code> Optional. For an SNMPv3 user whose interface parameter is set to <code>snmptarget</code>, this specifies the network address of the host that will receive SNMP traps. The value can be an IPv4 address, IPv6 address, or FQDN. <code>trap-port <port-number></code> Optional. For an SNMPv3 user, this parameter specifies the target port of the host that will receive SNMP traps. The default port is 162. <code>[type novice standard advanced diagnostic]</code> Optional. Identifies the user's experience level. This parameter is informational only and does not affect access to commands. The default is standard. <code>[units auto MB GB TB]</code> Optional. Sets the unit for display of storage-space sizes: • <code>auto</code>: Sizes are shown in units determined by the system. This is the default. • <code>MB</code>: Sizes are shown in megabytes. • <code>GB</code>: Sizes are shown in gigabytes. • <code>TB</code>: Sizes are shown in terabytes. Based on the <code>precision</code> 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 <code>units</code> is set to <code>TB</code>, <code>precision</code> is set to 1, and <code>base</code> is set to 10, the size 0.11709 TB is instead shown as 117.1 GB. <code><name></code> Specifies the user account to change. A name that includes a space must be enclosed in double quotes. <i>name</i>
Examples	Change the temperature scale and accessible interfaces for user <code>jsmith</code>. <pre># set user jsmith temperature-scale f interfaces wbi,cli</pre> Change the password for user <code>JDoe</code>. <pre># set user JDoe password Abcd_1234</pre> Change the authentication type for SNMPv3 user <code>testsnmp</code>.

	# set user testsnmp authentication-type SHA password Snmp3_Trap
See also	set password show users

set user-group

Description	Changes the settings for an LDAP user group. A user-group member with the <code>standard</code> or <code>manage</code> role can change any parameter except name. A member with the <code>monitor</code> role can change any parameter for that user except name, roles, and interfaces. User group changes take effect when a member of the group subsequently logs in after changes have been made to the settings of an LDAP user group.
Minimum role	monitor
Syntax	<pre>set user-group [base 2 10] [interfaces <interfaces>] [precision <#>] [roles <roles>] [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] <user-group-name></pre>
Parameters	<pre>[base 2 10]</pre> 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. <pre>[interfaces <interfaces>]</pre> Optional. Specifies the interfaces that the user can access. Multiple values must be separated by commas and no spaces <code>cli</code>: Command-line interface. This is enabled by default. <code>wbi</code>: PowerVault Manager web-browser interface. This is enabled by default. <code>ftp</code>: SFTP interface. <code>none</code>: No interfaces. Only secure protocols are supported for the above interfaces. To enable or disable interface protocols, use the <code>set protocols</code> command. <pre>[precision <#>]</pre> Optional. Sets the number of decimal places (1–10) for display of storage-space sizes.

	<pre>[roles <roles>]</pre> Optional. Specifies the user's roles as one or more of the following values: • <code>monitor</code>: User can view but not change system settings. This is the default. • <code>standard</code>: User can view and change system settings except: configuring local users; configuring LDAP; performing write operations through SFTP; performing file uploads from the PowerVault Manager; using the <code>restore defaults</code> command. • <code>manage</code>: User can view and change system settings. • <code>diagnostic</code>: For use by or with direction from technical support. 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. <pre>[storage-size-base 2 10]</pre> Optional. Alias for <code>base</code>. <pre>[storage-size-precision <#>]</pre> Optional. Alias for <code>precision</code>. <pre>[storage-size-units auto MB GB TB]</pre> Optional. Alias for <code>units</code>. <pre>[temperature-scale celsius c fahrenheit f]</pre> Optional. Sets the scale for display of temperature values: • <code>fahrenheit</code> or <code>f</code>: Temperatures are shown in degrees Fahrenheit. • <code>celsius</code> or <code>c</code>: Temperatures are shown in degrees Celsius. This is the default <pre>[timeout <#>]</pre> 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). <pre>[units auto MB GB TB]</pre> Optional. Sets the unit for display of storage-space sizes: • <code>auto</code>: Sizes are shown in units determined by the system. This is the default. • <code>MB</code>: Sizes are shown in megabytes. • <code>GB</code>: Sizes are shown in gigabytes. • <code>TB</code>: Sizes are shown in terabytes. Based on the <code>precision</code> 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 <code>units</code> is set to <code>TB</code>, <code>precision</code> is set to 1, and <code>base</code> is set to 10, the size 0.11709 TB is instead shown as 117.1 GB. <pre><user-group-name></pre> Specifies the user account to change. A name that includes a space must be enclosed in double quotes.
Examples	Change user group <code>StorageAdmins</code> to have the <code>manage</code> role for the CLI and PowerVault Manager interfaces. <pre># set user-group interfaces cli,wbi roles manage StorageAdmins</pre>
See also	create user-group delete user-group set ldap-parameters show audit-log show user-groups

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 <code>never-delete</code>. • 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	standard
Syntax	<pre>set volume [identifying-information <description>] [large-virtual-extents enabled disabled on off] [name <new-name>] [ovms-uid <ID>] [snapshot-retention-priority never-delete high medium low] [tier-affinity no-affinity archive performance] volume</pre>
Parameters	<code>[identifying-information <description>]</code> 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: <code><</code> <code>\</code> • A value that includes a space must be enclosed in double quotes. <code>[large-virtual-extents enabled disabled on off]</code> 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. • <code>disabled</code> or <code>off</code>: Optimized page allocation is disabled. This is the default. • <code>enabled</code> or <code>on</code>: Optimized page allocation is enabled <code>[name <new-name>]</code> 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: <code>"</code> <code>,</code> <code><</code> <code>\</code> • A value that includes a space must be enclosed in double quotes. <code>ovms-uid <ID></code> Optional. For a volume to be accessed by an OpenVMS host, assign a volume ID 1-32767 to identify the volume to the host. If you specify this parameter you cannot specify the <code>identifying-information</code> parameter. <code>[snapshot-retention-priority never-delete high medium low]</code> Optional. For virtual storage, this specifies the retention priority for snapshots of the volume. • <code>never-delete</code>: Snapshots will never be deleted. • <code>high</code>: 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. <pre>[tier-affinity no-affinity archive performance]</pre> 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. <pre><volume></pre> The name or serial number of the volume to change. A name that includes a space must be enclosed in double quotes.
Examples	<pre>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</pre>
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	standard
Syntax	<pre>set volume-cache-parameters [optimization standard standard-atomic-write cache-hit-atomic-write] [read-ahead-size disabled adaptive stripe 512KB 1MB 2MB 4MB 8MB 16MB 32MB] [write-policy write-back write-through wb wt] <volume> all</pre>
Parameters	<pre>optimization standard standard-atomic-write cache-hit-atomic-write</pre>

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.
- `standard-atomic-write`: This controller cache mode includes the `standard` mode features but also guarantees that if a failure (such as I/O being aborted or a controller failure) interrupts a data transfer between a host and the storage system, the controller cache contains either all the old data or all the new data, not a mix of old and new data. This option has a slight performance cost because it maintains a secondary copy of data in cache so that if a data transfer is not completed, the old cache data can be restored.
- `cache-hit-atomic-write`: This controller cache mode includes the `cache-hit` mode features but also guarantees that if a failure (such as I/O being aborted or a controller failure) interrupts a data transfer between a host and the storage system, the controller cache contains either all the old data or all the new data, not a mix of old and new data. This option has a slight performance cost because it maintains a secondary copy of data in cache so that if a data transfer is not completed, the old cache data can be restored.

[`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.

	<pre># set volume-cache-parameters write-policy wb optimization standard read-ahead-size stripe V1</pre>
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	standard
Syntax	<pre>set volume-group name <new-name> <volume-group></pre>
Parameters	<pre>name <new-name></pre> 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. <pre><volume-group></pre> 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. <pre># set volume-group name MyVGroup VGroup1</pre>
See also	show volume-groups

show advanced-settings

Description	Shows the settings for advanced system-configuration parameters.
Minimum role	monitor
Syntax	<pre>show advanced-settings</pre>
Output	<pre>Disk Group Background Scrub</pre> 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-group scrub is disabled. • Enabled: Background disk-group scrub is enabled. <pre>Disk Group Scrub Interval (v2)</pre> Shows the interval between background disk-group scrub finishing and starting again, from 0 to 2160 hours (90 days). <pre>Partner Firmware Upgrade</pre> 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.

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. 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. The dynamic spares feature does not apply to ADAPT disk groups.

- **Disabled:** The dynamic spares feature is disabled.
- **Enabled:** The dynamic spares feature is enabled.
- **Alternate:** The dynamic spares feature is enabled but spare selection is restricted to the enclosure that contains the failed disk.

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. Hosts can use the SCSI MODE SELECT command to change the write-back cache setting. This is the default.
- **Enabled:** Host control of caching is enabled. Hosts cannot override the storage system's write-back cache setting.

Sync Cache Mode

Shows how the SCSI SYNCHRONIZE CACHE command is handled.

- **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.

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.

Controller 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.

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. 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.

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. Restart on CAPI Fail 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. Auto Map Shows whether the auto map feature is enabled or disabled. When auto map is enabled, the system automatically maps initiators or hosts to volumes or volume groups that are mapped to a host group when those initiators or hosts are added to the host group. Auto Unmap Shows whether the auto unmap feature is enabled or disabled. When auto unmap is enabled, the system automatically unmaps initiators or hosts from volumes or volume groups that are mapped to a host group when those initiators or hosts are removed from the host group.
Examples	Show advanced system-configuration settings. <pre># show advanced-settings</pre>
Basetypes	advanced-settings-table status
See also	set advanced-settings

show alert-condition-history

Description	Shows the history of the alert conditions that have generated alerts. The most recent 3000 alert conditions are maintained in this log history, regardless of whether they are resolved or unresolved.
Minimum role	monitor
Syntax	<pre>show alert-condition-history [component <component-name> <component-type>] [id <condition-sequence-number>] [last <number-of-conditions>]</pre>
Parameters	<pre>[component <component-name> <component-type>]</pre> Optional. Shows alert conditions for a specific component name or type.

	• A valid name is any value shown by the <code>Component</code> property. • A valid type is any of the following values: <code>controller</code>, <code>disk</code>, <code>drawer</code>, <code>drawer_slot</code>, <code>enclosure</code>, <code>expander</code>, <code>fan</code>, <code>fan_control_module</code>, <code>fan_module</code>, <code>firmware_info</code>, <code>host_port</code>, <code>iom</code>, <code>mgmt_port</code>, <code>midplane</code>, <code>peer_connections</code>, <code>power_supply</code>, <code>sas_port</code>, <code>sensor</code>, <code>sideplane</code>, <code>slot</code>, <code>storage_pool</code>, <code>super_cap</code>, <code>system</code>. [id <condition-sequence-number>] Optional. Shows a specific condition by its Index value. [last <number-of-conditions>] Optional. Shows the specified number of most recent alert conditions.
Output	<code>Component</code> The component name. <code>Index</code> The alert condition sequence number. <code>Resolved</code> Shows whether the alert is resolved. <code>Time Detected</code> The date and time when the alert condition was detected. <code>Time Resolved</code> If <code>Resolved</code> is Yes, the date and time when the alert condition was resolved. <code>Reason</code> A message describing the alert condition.
Examples	Show last three alert conditions that generated alerts. <pre># show alert-condition-history last 3</pre> Show the alert condition having sequence number 356. <pre># show alert-condition-history id 356</pre> Show alert conditions for a specific component. <pre># show alert-condition-history component mgmtport_a</pre>
Basetypes	conditions status
See also	clear alerts set alert show alerts

show alerts

Description	Shows information about the active alerts on the storage system.  NOTE: The system presents a maximum of 512 alerts that are either unresolved, or resolved but unacknowledged. If further alerts are detected, resolved alerts are deleted to generate active alerts. If all 512 alerts are active, no new alerts are generated.
Minimum role	monitor
Syntax	<pre>show alerts</pre> [component <component-name> <component-type>] [unresolved resolved acknowledged unacknowledged]

	[detail]
Parameters	<code>component <component-name> <component-type></code> Optional. Shows active alerts for a specific component name or type. • A valid name is any value shown by the <code>Component</code> property in the command output. • A valid type is any of the following values: <code>controller</code>, <code>disk</code>, <code>drawer</code>, <code>drawer_slot</code>, <code>enclosure</code>, <code>expander</code>, <code>fan</code>, <code>fan_control_module</code>, <code>fan_module</code>, <code>firmware_info</code>, <code>host_port</code>, <code>iom</code>, <code>mgmt_port</code>, <code>midplane</code>, <code>peer_connections</code>, <code>power_supply</code>, <code>sas_port</code>, <code>sensor</code>, <code>sideplane</code>, <code>slot</code>, <code>storage_pool</code>, <code>super_cap</code>, <code>system</code>. • <code>unresolved resolved acknowledged unacknowledged</code> Optional. Shows only alerts with the specified status. <code>detail</code> Optional. Shows the time each active alert was detected and resolved.
Output	<code>ID</code> The alert sequence number. <code>Component</code> The component name. <code>Severity</code> • 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. <code>Resolved</code> Shows whether the alert is resolved. <code>Acknowledged</code> Shows whether the alert has been acknowledged. <code>Time Detected</code> Shown by the <code>detail</code> parameter. The most recent date and time when the alert condition was detected. <code>Time Resolved</code> Shown by the <code>detail</code> parameter. If <code>Resolved</code> is Yes, the date and time when the alert condition was resolved. <code>Reason</code> A message describing the alert condition. <code>Recommended Action</code> The recommended action to take to resolve the alert condition.
Examples	Show active alerts. <pre># show alerts</pre> Show active alerts for a specific component. <pre># show alerts component controller_a</pre> Show resolved alerts for sensor components. <pre># show alerts resolved component sensor</pre> Show detailed information about unresolved alerts.

	# show alerts unresolved detail
Basetypes	alerts status
See also	clear alerts set alert show alert-condition-history

show audit-log

Description	Shows audit log data. All user login and logout attempts and operations performed through the CLI, PowerVault Manager, and FTP/SFTP interface are recorded in the audit log. Failed login attempts are also recorded. The audit log will contain the timestamp, username, and command that was run as well as the status code returned by that command. The audit log contains a subset of the data that is stored in controller logs. The audit log will not contain specific value changes, such as old and new settings. Audit logs record host IP information for all interfaces. Audit logs also record snmpset commands. Each controller maintains its own audit log. Each audit log can contain up to 2MB of data, after which it will wrap. Audit log data will persist after restarting the Storage Controller or running the <code>restore defaults</code> command. Audit logs are not associated with the managed logs feature. Audit logs will be cleared during factory refurbishment. Audit log data is not mirrored to the partner controller. In a failover scenario, the failed controller's audit log cannot be retrieved until the failed controller is recovered. When the failed controller comes back online its audit log should be accessible.
Minimum role	monitor
Syntax	<pre>show audit-log [a b both] [last <number-of-entries>]</pre>
Parameters	<code>a b both</code> Optional. Specifies to show the audit log for controller A, B, or both. If this parameter is omitted, the audit log is shown for the current controller. <code>last <number-of-entries></code> Optional. Shows the specified number of most recent entries. If this parameter is omitted, all events are shown.
Output	All audit log entries for the specified controller(s) are listed in chronological order by date and time. An entry may contain the following fields: • Date and time • Facility ID and name (for internal use) • Process • C: Controller ID • UID: Username • GID: Group name, or "-" if not supported • SID: Session ID • A: Action • SSID: MC subsystem ID • RC: Return code

	• M: Message The session ID is logged only when authentication is successful and a session has been created. The subsystem ID and return code are for diagnostic purposes.
Examples	Show the audit log for controller B only. <pre># show audit-log b</pre>
Basetypes	audit-log status
See also	show user-groups

show cache-parameters

Description	Shows cache settings and status for the system and optionally for a volume.
Minimum role	monitor
Syntax	<pre>show cache-parameters</pre> <pre>[<volume>]</pre>
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: • 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. Cache Block Size Shows the system's cache block size. 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 fan 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. Cache Flush • Enabled: If the controller loses power, it will automatically write cache data to the memory 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: • <code>write-back</code>: 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. • <code>write-through</code>: 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: • <code>standard</code>: 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. • <code>standard-atomic-write</code>: This controller cache mode includes the <code>standard</code> mode features but also guarantees that if a failure (such as I/O being aborted or a controller failure) interrupts a data transfer between a host and the storage system, the controller cache contains either all the old data or all the new data, not a mix of old and new data. This option has a slight performance cost because it maintains a secondary copy of data in cache so that if a data transfer is not completed, the old cache data can be restored. • <code>cache-hit-atomic-write</code>: This controller cache mode includes the <code>cache-hitmode</code> features but also guarantees that if a failure (such as I/O being aborted or a controller failure) interrupts a data transfer between a host and the storage system, the controller cache contains either all the old data or all the new data, not a mix of old and new data. This option has a slight performance cost because it maintains a secondary copy of data in cache so that if a data transfer is not completed, the old cache data can be restored. Read Ahead Size If a volume is specified, its read-ahead cache setting: • <code>Disabled</code>: Read-ahead is disabled. • <code>Adaptive</code>: Adaptive read-ahead is enabled, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload. • <code>Stripe</code>: 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. • <code>512 KB, 1 MB, 2 MB, 4 MB, 8 MB, 16 MB, or 32 MB</code>: Size selected by a user.
Examples	Show the cache parameters for the system and for volume V1. <pre># show cache-parameters V1</pre>
Basetypes	cache-settings cache-parameter (if a volume is specified) 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	<code>show certificate</code>

	[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	Controller • A: Controller A. • B: Controller B. 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 <i>year-month-day hour:minutes:seconds</i> when the certificate was created.
Examples	Show certificate status for the system. <pre># show certificate</pre>
Basetypes	certificate-status status
See also	create certificate

show certificates

Description	Displays a list of available server or device certificates that have been added to the storage system. The command shows information about all uploaded certificates by default, or you can use parameters to filter the output. Use the <code>truststore</code> parameter to see information about root and intermediate certificates in the trust store.
Minimum role	manage
Syntax	<pre>show certificates [controller a b both] [detail] [name <name>] [service web] [truststore]</pre>
Parameters	controller a b both Optional. Shows certificates only on the specified controller. The default value is <code>both</code>. detail Optional. Provides list-view information about each certificate, including additional information not shown in the table view.

	<code>name <name></code> Optional. Provides information only about the certificate specified by name. The name provided must be a valid name of a certificate on the system. <code>service web</code> Optional. Limits display of certificates to the indicated service. <code>truststore</code> Optional. Displays all certificates in the trust store.
Output	Output without the <code>truststore</code> parameter <code>Certificate Name</code> The name of the certificate, either system-generated or user-supplied when the certificate is uploaded to the system. <code>Certificate Type</code> Shows the certificate type: Device-Cert <code>Controller</code> Displays the controller on which the certificate is installed. <code>WEB</code> Displays an x if the certificate is currently active for the web service. <code>Active Services</code> Shown by the <code>detail</code> parameter. Displays the service that is actively using the certificate, if any. <code>Identity</code> Shown by the <code>detail</code> parameter. The username registered with a WPA authentication server, in any. <code>Valid From</code> Shows the certificate start date. <code>Valid Till</code> Shows the certificate expiration date. <code>Issued To</code> The name or organization the certificate was granted to. <code>Issued By</code> The organization or entity that granted the certificate. <code>State</code> The current status of the certificate: • Available • Unavailable  NOTE: By default, the command displays certificates on both controllers. If the partner controller is down or not communicating, certificates from the partner are shown as Unavailable. <code>Certificate Status</code> Shows the source of the certificate: • Customer-supplied: The certificate was uploaded by the end user. • System-generated: The certificate was generated by the system. • Unknown status: The origin of the certificate cannot be determined. <code>Default Services</code> Displays any service associated with the certificate by default.

	i NOTE: A default service applies only to system-generated certificates and can be set only during manufacturing. If a default certificate is available for a service and a customer-supplied certificate for that service has been removed or not added, the system uses the default certificate. Certificate Text Shown by the <code>detail</code> parameter. Displays the certificate content as text. Output with the <code>truststore</code> parameter Certificate Name The name of the certificate, either system-generated or user-supplied when the certificate is uploaded to the system. Certificate Type Shows the certificate type: <code>Trust-Cert</code> Controller Displays the controller on which the certificate is installed. Valid From Shows the certificate start date. Valid Till Shows the certificate expiration date. Issued To The name or organization the certificate was granted to. Issued By The organization or entity that granted the certificate. State The current status of the certificate: • Available • Unavailable i NOTE: By default, the command displays certificates on both controllers. If the partner controller is down or not communicating, certificates from the partner are shown as Unavailable. Certificate Status Shows the source of the certificate: • Customer-supplied: The certificate was uploaded by the end user. • System-generated: The certificate was generated by the system. • Unknown status: The origin of the certificate cannot be determined. Certificate Text Shown by the <code>detail</code> parameter. Displays the certificate content as text.
Examples	Show all device certificates. <pre># show certificates</pre> Show certificate details for a certificate specified by name. <pre># show certificates detail name bobCert_12345</pre> Display all certificates in the trust store. <pre># show certificates truststore</pre> Display trust store certificates on controller A. <pre># show certificates truststore controller A</pre>
Basetypes	certificates status

See also	activate certificate create certificate-signing-request remove certificate show 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	<pre>show chap-records [name <originator-name>] [show-secrets]</pre>
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: standard. Shows Initiator Secret and Mutual CHAP Secret values in command output. If this parameter is omitted, secret values are not shown.
Output	<pre>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.</pre>
Examples	As a user with the monitor role, show the CHAP record for a specific host initiator. <pre># show chap-records name iqn.1991-05.com.microsoft:myhost.domain</pre> As a user with the manage role, show the CHAP record for a specific host initiator. <pre># show chap-records name iqn.1991-05.com.microsoft:myhost.domain show-secrets</pre>
Basetypes	chap-records status
See also	create chap-record delete chap-records set chap-record show iscsi-parameters

show ciphers

Description	Shows the ciphers that the system is using to securely communicate with hosts.
Minimum role	manage
Syntax	<code>show ciphers</code>
Output	• Active cipher list • User-supplied cipher list (set with the <code>set ciphers</code> command) • Default cipher list
Examples	Show the cipher list. <pre># show ciphers</pre>
Basetypes	ciphers status
See also	reset ciphers set ciphers

show cli-parameters

Description	Shows the current CLI session preferences.
Minimum role	monitor
Syntax	<code>show cli-parameters</code>
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 • <code>console</code>: 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. • <code>api</code>: Supports scripting by displaying command output in XML. All objects are displayed at the same level, related by COMP elements. • <code>api-embed</code>: Alternate form of XML output which displays “child” objects embedded (indented) under “parent” objects. • <code>ipa</code>: Alternate form of XML output which displays as api-embed format with <code>brief</code> mode enabled. • <code>json</code>: Standard JavaScript Object Notation (JSON) output. • <code>wbi</code>: A JSON-like format used internally by the PowerVault Manager. Brief Mode The base for entry and display of storage-space sizes: • <code>enabled</code>: In XML output, this setting shows a subset of attributes of object properties. The name and type attributes are always shown. • <code>disabled</code>: In XML output, this setting shows all attributes of object properties. This is the default. Base • <code>2</code>: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude. • <code>10</code>: 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. <code>Pager</code>

	• <code>enabled</code> : Halts output after each full screen to wait for keyboard input. • <code>disabled</code> : Output is not halted. When displaying output in API format, which is intended for scripting, disable paging. <code>Locale</code> The display language. <code>Precision #</code> The number of decimal places (1–10) for display of storage-space sizes. <code>Units</code> The unit for display of storage-space sizes: • <code>auto</code>: Sizes are shown in units determined by the system. • <code>MB</code>: Sizes are shown in megabytes. • <code>GB</code>: Sizes are shown in gigabytes. • <code>TB</code>: 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 <code>units</code> is set to <code>TB</code>, <code>precision</code> is set to 1, and <code>base</code> is set to 10, the size 0.11709 TB is instead shown as 117.1 GB. <code>temperature scale</code> • <code>fahrenheit</code> or <code>f</code>: Temperatures are shown in degrees Fahrenheit. • <code>celsius</code> or <code>c</code>: Temperatures are shown in degrees Celsius. This is the default.
Examples	Show current CLI settings. <pre># show cli-parameters</pre>
Basetypes	cli-parameters status
See also	set cli-parameters

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 <code>set cli-parameters</code> command.
Minimum role	monitor
Syntax	<code>show configuration</code>
Output	• System information from show system • Controller information from show controllers • Configured DNS settings from show dns-parameters • The DNS management hostname for each controller from show dns-management-hostname • Controller firmware and hardware version information from show versions with the <code>detail</code> parameter • Host and expansion port information from show ports • Disk information from show disks • Disk-slot information from show disks with the <code>encl</code> parameter • 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 dns-parameters mgmt-hostnames versions fru-versions port drives enclosure-list 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 <i>year-month-day hour:minutes:seconds</i> 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. <pre># show controller-date</pre>
Basetypes	time-settings-table status
See also	set controller-date set ntp-parameters show ntp-status

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	<pre>show controller-statistics [a b both]</pre>
Output	<pre>a b both</pre> Optional. Specifies whether to show information for controller A, B, or both. If this parameter is omitted, information is shown for both controllers.
Examples	Durable ID The controller ID in the format <code>controller_<ID></code>. 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 <code><year>-<month>-<day><hour>:<minutes>:<seconds></code>, when these statistics were last reset, either by a user or by a controller restart. Total Power On Hours The total amount of hours the controller has been powered on in its life time.
Examples	Show statistics for controller A. <pre># show controller-statistics a</pre>
Basetypes	controller-statistics status
See also	reset all-statistics reset controller-statistics

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 IPv4 address. IP6 Link Local The link-local IPv6 address. IP6 Link Local GW The network port gateway IPv6 address. 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. DHCPv6 The IP address assigned by a DHCPv6 server. SLAAC IP Address The IP address computed by SLAAC. IP6 Auto Gateway The IPv6 address of a gateway system (auto-discovered, not configured). IP6 Address (1-4) From one to four manually set IPv6 addresses. Only shown when the controller is set to manual IPv6 addressing. IP6 Gateway (1-4) From one to four manually set network-port gateway IPv6 addresses. Only shown when the controller is set to manual IPv6 addressing. Disks

Number of disks in the storage system.

Virtual Pools

Number of virtual pools in the storage system.

Disk Groups

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: • 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: 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. <pre># show controllers</pre>
Basetypes	controllers status
See also	show configuration show frus

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	<pre>show disk-group-statistics [disk-group <disk-group>] [type linear virtual]</pre>
Parameters	<code>disk-group <disk-group></code> 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. <code>type linear virtual</code> 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).
Examples	Show live performance statistics for all disk groups. <pre># show disk-group-statistics</pre> Show live performance statistics for disk group <i>dg0001</i>. <pre># show disk-group-statistics disk-group dg0001</pre>
Basetypes	disk-group-statistics status
See also	reset all-statistics

reset disk-group-statistics

show disk-groups

show disk-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	<pre>show disk-groups [detail] [pool <pool>] [scrub-status] [<disk-groups>]</pre>
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. NOTE: For linear disk groups, the pool name is the disk group name (the disk group always occupies 100% of the pool). scrub-status Optional. Shows disk-group properties related to the scrub utility, including the scrub duration goal. [<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	Name The name of the disk group. Blocksize Shown by the detail parameter. The size of a block, in bytes. Size The capacity of the disk group, formatted to use the current base, precision, and units. Free The amount of free space in the disk group, formatted to use the current base, precision, and units. Class Shown by the detail parameter. - Linear: The disk group acts as a linear pool. - Virtual: The disk group is in a virtual pool. Pool The name of the pool that contains the disk group. 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). • Archive: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • Read Cache: The disk group uses SSDs, which provide high-speed read cache for a storage pool.
% of Pool
The percentage of pool capacity that the disk group occupies.
Own
Either the preferred owner during normal operation or the partner controller when the preferred owner is offline.
Current Owner
Shown by the <code>detail</code> parameter. See Own .
Preferred Owner
Shown by the <code>detail</code> parameter. Controller that owns the disk group and its volumes during normal operation.
RAID
The RAID level of the disk group.
Disks
The number of disks in the disk group.
Spares
Shown by the <code>detail</code> parameter. For a linear disk group, the number of spares assigned to the disk group. For a virtual disk group, 0.
Chk
• For RAID levels except NRAID and RAID 1, the chunk size for the disk group. • For NRAID and RAID 1, not applicable (N/A).
Chunk Size
Shown by the <code>detail</code> parameter. See Chk .
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. • 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: The disk group is online and does not have fault-tolerant attributes.
Current Job
• DRSC: A disk is being scrubbed.

- **EXPD:** The disk group is being expanded.
- **INIT:** The disk group is initializing.
- **PRERCON:** At least one disk in the disk group is being preemptively reconstructed.
- **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.

Job%

- 0%–99%: Percent complete of running job
- Blank if no job is running (job has completed)

Current Job Completion

Shown by the detail parameter. See **Job%**.

Serial Number

Shown by the detail parameter. The serial number of the disk group.

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.

Active Drive Spin Down Delay

Shown by the detail parameter. For spinning disks in a 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.

Scrub Duration Goal

Shown by the **scrub-status** parameter. The requested duration of a disk-group scrub operation, in hours. A value of 0 indicates that the scrub duration will use the system default duration setting of 720 hours (30 days). A value of 1 to 1080 hours (45 days) will cause the storage system to adjust the resources available to the scrub operation, which could affect other performance. There is no guarantee that this scrub duration goal is achievable, due to such considerations as disk-group size or abnormally high host activity.

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**.

Stripe Width

Shown by the detail parameter. For an ADAPT disk group, this specifies the stripe width to use.

	• 8+2: Each stripe contains 8 data chunks and 2 parity chunks. Including spare capacity equivalent to the 2 largest disks, the minimum disk-group size is 12 disks. This is the default. • 16+2: Each stripe contains 16 data chunks and 2 parity chunks. Including spare capacity equivalent to the 2 largest disks, the minimum disk-group size is 20 disks. This option has less overhead, but also less redundancy, than the 8+2 option. Target Spare Capacity Shown by the detail parameter. • <size>: The target spare capacity in GiB. If the value is 0, the absolute minimum spare space will be used. • default: The target spare capacity will be 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. • For a non-ADAPT disk group, N/A. Actual Spare Capacity Shown by the detail parameter. • For an ADAPT disk group, the actual spare capacity in GiB. • For a non-ADAPT disk group, N/A. Critical Disk Capacity Shown by the detail parameter. For an ADAPT disk group, the amount of storage space that is not currently protected against disk loss, in GiB. (Normally all data is protected against loss of two disks.) Degraded Disk Capacity Shown by the detail parameter. For an ADAPT disk group, the amount of storage space that is protected against loss of a single disk only, in GiB. (Normally all data is protected against loss of two disks.) Linear Volume Partition Boundary Shown by the detail parameter. 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. Metadata Size Shown by the detail parameter. The amount of metadata the disk group is currently using. Health • OK • Degraded • Fault • N/A • Unknown Reason If Health is not OK, this field shows the reason for the health state. Health Reason Shown by the detail parameter. See Reason. Action If Health is not OK, this field shows recommended actions to take to resolve the health issue. Health Recommendation Shown by the detail parameter. See Action.
Examples	Show information about all disk groups. <pre># show disk-groups</pre> Show information about disk group dg0002. <pre># show disk-groups dg0002</pre> Show additional information about disk group dg0002. <pre># show disk-groups dg0002 detail</pre>

Basetypes	disk-groups status
See also	show disks show pools

show disk-parameters

Description	Shows disk settings.
Minimum role	monitor
Syntax	<code>show disk-parameters</code>
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. <pre># show disk-parameters</pre>
Basetypes	drive-parameters status
See also	set disk-parameters

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: <pre>show disk-statistics [error-stats] [<disks>]</pre> To show historical statistics: <pre>show disk-statistics [all] [count <number-of-data-samples>] [filename <filename>.csv] historical [time-range "date/time-range"] <disks></pre>
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 <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 <i>year-month-day hour:minutes:seconds</i> , 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 <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 output

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 <code>all</code> parameter. The data transfer rate, in bytes per second, for write operations since the last sampling time. <code>Queue Depth</code> Shown by the <code>all</code> 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. <code>I/O Resp Time</code> The average response time, in microseconds, for read and write operations since the last sampling time. <code>Read Resp Time</code> Shown by the <code>all</code> parameter. The average response time, in microseconds, for read operations since the last sampling time. <code>Write Resp Time</code> Shown by the <code>all</code> parameter. The average response time, in microseconds, for write operations since the last sampling time. <code>Average I/O Size</code> Shown by the <code>all</code> parameter. The average data size of read and write operations since the last sampling time. <code>Average Read I/O Size</code> Shown by the <code>all</code> parameter. The average data size of read operations since the last sampling time. <code>Average Write I/O Size</code> Shown by the <code>all</code> parameter. The average data size of write operations since the last sampling time. <code>Number of Disk Errors</code> Shown by the <code>all</code> 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. <code>Sample Time</code> Date and time, in the format <i>year-month-day hour:minutes:seconds</i>, when the data sample was taken
Examples	Show live statistics for disks 1.1 and 2.1. <pre># show disk-statistics 1.1,2.1</pre> Show live error statistics for all disks. <pre># show disk-statistics error-stats</pre> Show historical statistics from a specified date and time range for disk 1.5. <pre># show disk-statistics 1.5 historical time-range "start 2011-12-05 4:40 PM end 2011-12-05 5:00 PM"</pre> Show all samples of historical statistics for disk 1.5. <pre># show disk-statistics 1.5 historical all</pre>
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 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. If undergoing an erase (ERAS) operation, the command reports the disk as <code>UNUSABLE</code>, with a health condition of <code>Degraded</code>. The <code>Jobs</code> field shows <code>ERAS</code>.
Minimum role	monitor
Syntax	To show information about disks: <pre>show disks [disk-group <disk-groups>] [<disks>] [detail] [[fde] [perf] [temp]</pre> To show information about disks having specific Usage values: <pre>show disks usage available failed leftover pool spares unusable</pre> To show information about all disk slots: <pre>show disks encl</pre>
Parameters	<code>detail</code> Optional. This parameter shows additional detail about the disk. If undergoing an erase operation, the output detail shows the ERAS job and related information: <code>disk Usage is UNUSABLE; Health is set to Degraded; Health Reason</code> and <code>Health Recommendation</code> are described. <pre>disk-group disk-groups</pre> 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. <pre>encl</pre> Optional. Shows information about each disk slot, whether it contains a disk or not. You cannot use this parameter with any other parameter. <pre>fde</pre> Optional. For all or specified disks, this option shows Full Disk Encryption information. Information shown includes the FDE state and lock key ID. <pre>perf</pre> 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. <pre>temp</pre> Optional. Shows the temperature for all installed disks. <pre>usage available failed leftover pool spares unusable</pre> Shows information about disks having specific Usage values: • <code>available</code>: Disks whose usage is <code>AVAIL</code>. • <code>failed</code>: Disks whose usage is <code>FAILED</code>

	• leftover: Disks whose usage is LEFTOVR. • pool: Disks whose usage is VIRTUAL POOL. Disks whose usage is LINEAR POOL. Disks whose usage is LINEAR POOL or VIRTUAL POOL. • spares: Disks whose usage is GLOBAL SP. Disks whose usage is DEDICATED SP or GLOBAL SP. Disks whose usage is DEDICATED SP or GLOBAL SP. • unusable: Disks whose usage is UNUSABLE. For explanation of usage values, see the <code>Usage</code> 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
Output	Properties are described in alphabetical order. Copyback State Shown by the <code>detail</code> parameter. • N/A: Not applicable. Current Job Shown by the <code>detail</code> parameter. See <code>Jobs</code>, below. Data Transferred Shown by the <code>perf</code> parameter. The total number of bytes transferred. Description Shown by default or by the <code>detail</code>, <code>encl</code>, or <code>perf</code> parameter. • SAS: Enterprise SAS spinning disk. • SAS MDL: Midline SAS spinning disk. • SSD SAS: SAS solid-state disk. Disk Group Shown by default or by the <code>detail</code> parameter. The name of the disk group that contains the disk. Drawer ID Shown by the <code>detail</code> parameter. The ID of the drawer containing the disk. Drive Spin Down Count Shown by the <code>detail</code> parameter. The number of times the DSD feature has spun down this disk. Encl Shown by the <code>encl</code> parameter. The number of the enclosure where the disk is located. FDE State Shown by the <code>detail</code> or <code>encl</code> 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 <code>detail</code>, <code>encl</code>, or <code>perf</code> 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.
- ERAS: The disk is being erased.
- EXPD: The disk group is being expanded.
- INIT: The disk group is being initialized.
- PRERCON: The disk is being used in a preemptive reconstruct operation.
- RBAL: The ADAPT disk group is being rebalanced.
- RCON: The disk is being used in a reconstruct operation.
- REFT: The ADAPT disk group's fault-tolerant stripes are being rebalanced.
- 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:

- Online: The disk is operating normally.
- Rebuild: The disk's disk group is being reconstructed.
- Fault: The disk has a fault.
- ID: The disk's identification LED is illuminated.
- 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 `encl` parameter. The current lock key ID.

Model

Shown by the `detail` or `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` or `encl` 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 `encl` or `perf` or `temp` 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.

Sector Format

Shown by the `detail` parameter. See `Sec Fmt` above.

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.

Size

Shown by default and by any parameter except `encl` 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.

Supports Unmap

Shown by the `detail` parameter. Shows whether the disk supports the SCSI UNMAP command.

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. 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 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. ◦ The disk is from an unsupported vendor. ◦ The disk is being erased. • UNUSABLE: The disk cannot be used in a disk group because the disk is from an unsupported vendor. • VIRTUAL POOL: The disk is a member of a disk group in a virtual pool. Vendor Shown by default and by any parameter except temp. The vendor of the disk.
Examples	Show disk information. <pre># show disks</pre> Show disk-slot information. <pre># show disks encl</pre> Show disk performance statistics. <pre># show disks perf</pre> Show Full Disk Encryption information. <pre># show disks encl</pre> Show disk temperature information. <pre># show disks temp</pre> Show detailed information for disk 1.1: <pre># show disks 1.1 detail</pre> Show information about available disks only: <pre># show disks usage available</pre>
Basetypes	drives enclosure-list status
See also	show disk-groups

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. <pre># show dns-management-hostname</pre>
Basetypes	mgmt-hostnames status
See also	clear dns-parameters set dns-management-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	<pre>show dns-parameters [controller a b both]</pre>
Output	Controller The controller ID: A or B. Name Servers Configured name server IP address values. Search Domains Configured domain name values
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.
Examples	Show the system's DNS settings. <pre># show dns-parameters</pre>
Basetypes	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	<code>show email-parameters</code>
Output	Email Notification • Disabled: Email notification is disabled. • Enabled: Email notification is enabled. 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 • <code>tls</code>: Enables Transport Layer Security (TLS) authentication. • <code>ssl</code>: Enables Secure Sockets Layer (SSL) authentication. • <code>none</code>: No authentication is enabled. 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 Alert Notification Shows the filter for which alert notifications will be sent: • <code>all</code>: Sends notifications for all alerts. • <code>none</code>: Disables email notification for alerts. Event Notification Shows the minimum severity for which the system should send event notifications: • <code>crit</code>: Sends notifications for Critical events only. • <code>error</code>: Sends notifications for Error and Critical events. • <code>warn</code>: Sends notifications for Warning, Error, and Critical events. • <code>resolved</code>: Sends notifications for Resolved, Warning, Error, and Critical events. • <code>info</code>: Sends notifications for all events. • <code>none</code>: Disables email notification and clears the settings. This parameter does not apply to managed-logs notifications. 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. <pre># show email-parameters</pre>
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	<code>show enclosures</code>
Parameters	<code>Encl</code> The enclosure ID. <code>Encl WWN</code> The enclosure WWN. <code>Name</code> The enclosure name. <code>Location</code> The enclosure location, or blank if not set. <code>Rack</code> The number of the rack that contains the enclosure. <code>Pos</code> The position of the enclosure in the rack <code>Vendor</code> The enclosure vendor. <code>Model</code> The enclosure model. <code>Top Level Assembly Part Number</code> The enclosure TLA part number, if present. <code>GEM Version <controller-ID></code> The GEM firmware component version in each controller's Expander Controller. <code>EMP controller-ID BUS:ID Rev</code> The channel ID and firmware revision of the Enclosure Management Processor in each controller's Expander Controller. <code>Midplane Type</code> 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. <code>Health</code> Show information about all enclosures in the system. • 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. Drawer WWN The WWN 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. <pre># show enclosures</pre>
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	<pre>show events [a b both error] [detail] [from <timestamp>] [from-event <event-ID>] [last <number-of-events>] [logs yes no] [to <timestamp>] [to-event <event-ID>]</pre>
Parameters	<code>a b both error</code> Optional. Specifies to filter the event listing: • <code>a</code>: Shows events from controller A only. Do not use this parameter with the <code>from-event</code> parameter or the <code>to-event</code> parameter. • <code>b</code>: Shows events from controller B only. Do not use this parameter with the <code>from-event</code> parameter or the <code>to-event</code> parameter. • <code>both</code>: Shows events from both controllers. Do not use this parameter with the <code>from-event</code> parameter or the <code>to-event</code> parameter. • <code>error</code>: Shows Warning, Error, and Critical events, but not Informational or Resolved events. <code>detail</code> Optional. Shows additional information and recommended actions for displayed events. <code>from <timestamp></code> Optional. Shows events that occurred on or after a timestamp specified with the format <i>MMDDYYhhmmss</i>. For example, 043020235900 represents April 30 2020 at 11:59:00 p.m. This parameter can be used with the <code>to</code> parameter or the <code>to-event</code> parameter. <code>from-event <event-ID></code> 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 <code>to</code> parameter or the <code>to-event</code> parameter. <code>last #</code> Optional. Shows the latest specified number of events. If this parameter is omitted, all events are shown. <code>logs yes no</code> Optional. • <code>no</code>: Lists events as described in the Output section, below. This is the default. • <code>yes</code>: Shows events in tabular format, with columns for event ID, date and time, event code, severity, and message. <code>to <timestamp></code> Optional. Shows events that occurred on or before a timestamp specified with the format <i>MMDDYYhhmmss</i>. For example, 043020235900 represents April 30 2020 at 11:59:00 p.m. This parameter can be used with the <code>from</code> parameter or the <code>from-event</code> parameter. <code>to-event <event-ID></code> 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 <code>from</code> parameter or the <code>from-event</code> 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 <i>immediately</i>. ◦ 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. <pre># show events last 2</pre> Show the last three non-Informational events. <pre># show events last 3 error</pre> Show all events from April 30 2020 at 11:59:00 p.m. through May 2 2020 at 11:59:00 a.m. <pre># show events from 043020235900 to 050220115900</pre> Show a range of events logged by controller A. <pre># show events from-event a100 to-event a123</pre> Show detailed output for a specific event. <pre># show events from-event A2264 from-event A2264 detail</pre>
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	<pre>show expander-status</pre> <pre>[stats]</pre>
Parameters	stats Optional. Shows PHY error statistics.
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 "--".

Type :

- Drive: Drive slot PHY.
- SC-P: Storage Controller primary PHY.
- SC-A: Storage Controller alternate PHY.
- Expander-Universal-0: Expansion port 0 universal PHY.
- Expander-Universal-1: Expansion port 1 universal PHY.
- Expander-Universal-2: Expansion port 2 universal PHY.
- Drawer0-Ingress-0: Drawer 0 ingress PHY 0.
- Drawer0-Ingress-1: Drawer 0 ingress PHY 1.
- Drawer0-Ingress-2: Drawer 0 ingress PHY 2.
- Drawer0-Egress-0: Drawer 0 egress PHY 0.
- Drawer0-Egress-1: Drawer 0 egress PHY 1.
- Drawer0-Egress-2: Drawer 0 egress PHY 2.
- Drawer1-Ingress-0: Drawer 1 ingress PHY 0.
- Drawer1-Ingress-1: Drawer 1 ingress PHY 1.
- Drawer1-Ingress-2: Drawer 1 ingress PHY 2.
- Drawer1-Egress-0: Drawer 1 egress PHY 0.
- Drawer1-Egress-1: Drawer 1 egress PHY 1.
- Drawer1-Egress-2: Drawer 1 egress PHY 2.

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.

	• <code>Error count interrupts</code>: PHY disabled because of error-count interrupts. • <code>Phy control</code>: PHY disabled by a SES control page as a result of action by a Storage Controller or user. • <code>Not ready</code>: 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. • <code>Firmware reboot</code>: PHY disabled because of a firmware reboot. . • <code>Drive removed</code>: PHY disabled because drive slot is empty. • <code>Unused - disabled by default</code>: PHY is disabled by default because it is not used. • <code>Excessive Phy changes</code>: PHY is disabled because of excessive PHY change counts. • <code>Did not initialize</code>: HY is enabled but not ready because it did not pass COMINIT. <code>Change Cnt</code> Shown by the <code>stats</code> parameter. The 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>Code Viol</code> Shown by the <code>stats</code> parameter. The number of times the PHY received an unrecognized or unexpected signal. <code>Disparity</code> Shown by the <code>stats</code> parameter. 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. <code>CRC Errors</code> Shown by the <code>stats</code> parameter. In a sequence of SAS transfers (frames), the data is protected by a cyclic redundancy check (CRC) value. The <code>CRC Errors</code> 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. <code>Conn CRC</code> Shown by the <code>stats</code> parameter. The number of times the lane between two expanders experienced a communication error. <code>Lost DWORD</code> Shown by the <code>stats</code> parameter. The number of times the PHY has lost doubleword synchronization and restarted the Link Reset sequence. <code>Invld DWORD</code> Shown by the <code>stats</code> parameter. The number of invalid doublewords that have been received by the PHY, not including those received during Link Reset sequences. <code>ResErrCnt</code> Shown by the <code>stats</code> parameter. The number of times the expander performed a reset of error counters. <code>Flag Bits</code> Shown by the <code>stats</code> parameter. PHY status bits, for internal use.
Examples	Show expander status for each enclosure. <pre># show expander-status</pre>
Basetypes	sas-status-controller-a status
See also	clear expander-status

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	<code>show fan-modules</code>
Output	<code>Encl</code> The ID of the enclosure that contains the fan module. <code>Id</code> 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. <code>Name</code> The name of the fan module in the format Fan Module Id. <code>Health</code> • OK • Degraded • Fault • N/A • Unknown <code>Reason</code> If Health is not OK, this field shows the reason for the health state. <code>Action</code> 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. <code># show fan-modules</code>
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	<code>show fans</code>
Output	<code>Name</code> The fan name. <code>Location</code> The fan location in the enclosure. <code>Status</code>

	• 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 The fan serial number, if available. Part Number The fan part number, if available. Firmware version The firmware revision of the fan FRU, if available. Hardware version The hardware revision of the fan FRU, if available. Health 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. <pre># show fans</pre>
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	<code>show fde-state</code>
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. <pre># show fde-state</pre>
Basetypes	fde-state status
See also	clear fde-keys set fde-import-key set fde-lock-key set fde-state

show firmware-bundles

Description	Displays the active firmware bundle and an available firmware bundle stored in the system's controller modules. The available bundle is either the previous active bundle or a bundle loaded by a user. The active and available firmware bundles will be synchronized between partner controller modules.
Minimum role	monitor
Syntax	<code>show firmware-bundles</code>
Output	Bundle Version Version name of the firmware bundle. Build Date Build date of the firmware bundle. Status Status of the firmware bundle. Status could be one of the following: • Active: Indicates that the firmware is actively running on the controller. • Available: Indicates that the firmware is installed on the controller, and is available to be activated. • Invalid: Indicates that the firmware is invalid due to compatibility or signature failure or was not activated in a previous activation attempt. • Inactive: Indicates an inactive bundle. Health Health of the firmware bundle. Health could be one of the following: • OK: Indicates that this firmware is actively running on the controller.

	• Degraded: Indicates that this firmware is incomplete or not in sync with the partner controller. • Failed: Indicates that firmware is corrupted or incompatible or some components failed to load correctly. Reason If <code>Health</code> is not OK, this field shows the reason for the health state. Action If <code>Health</code> is not OK, this field shows recommended actions to take to resolve the health issue.
Examples	Show firmware bundles. <pre># show firmware-bundles</pre>
Basetypes	firmware-bundles status
See also	activate firmware show firmware-update-status show versions

show firmware-update-status

Description	Displays the current status of any firmware update on the system.
Minimum role	monitor
Syntax	<code>show firmware-update-status</code>
Output	Summary information including the type of activity, start time, completion time, estimated time to completion, percent completed, completion status, bundle version, and details about each process step.
Examples	Show firmware update status on the system. <pre># show firmware-update-status</pre>
Basetypes	update-status-summary status
See also	activate firmware show firmware-bundles

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	<pre>show frus</pre> <pre>[secrets]</pre>
Parameters	<code>secrets</code> ptional. Shows additional information about the midplane.
Output	Output without the secrets parameter 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

Output with the secrets parameter

FRU ID OUI

	Organizationally Unique Identifier of the midplane. • <code><value></code>: The OUI. • <code>unassigned</code>: No OUI assigned. FRU ID Revision Level Revision level of the midplane. • <code><value></code>: The FRU ID revision level. • <code>unassigned</code>: No FRU ID revision level assigned. Supplier Part Number Part number assigned to the midplane by the supplier. • <code><value></code>: The supplier part number. • <code>unassigned</code>: No supplier part number assigned. Supplier Serial Number Serial number assigned to the midplane by the supplier. • <code><value></code>: The supplier serial number. • <code>unassigned</code>: No supplier serial number assigned. Top Level Assembly Part Number Part number assigned to the top level assembly. • <code><value></code>: The top-level assembly part number. • <code>unassigned</code>: No top-level assembly part number assigned. Top Level Assembly Serial Number Serial number assigned to the top level assembly. • <code><value></code>: The top-level assembly serial number. • <code>unassigned</code>: No top-level assembly serial number assigned. OEM Part Number Part number assigned to the midplane by the OEM. • <code><value></code>: The OEM part number. • <code>unassigned</code>: No OEM part number assigned. OEM Serial Number Serial number assigned to the midplane by the OEM. • <code><value></code>: The OEM serial number. • <code>unassigned</code>: No OEM serial number assigned. SCSI Vendor ID Vendor name returned by the SCSI INQUIRY command. • <code><value></code>: The SCSI vendor ID. • <code>unassigned</code>: No SCSI vendor ID assigned. SCSI Product ID Product identifier returned by the SCSI INQUIRY command. • <code><value></code>: The SCSI product ID. • <code>unassigned</code>: No SCSI product ID assigned.
Examples	Show information about all FRUs in the system. <pre># show frus</pre> Show additional information about the midplane: <pre># show frus secrets</pre>
Basetypes	enclosure-fru <code>enclosure-fru-secrets</code> 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	<pre>show host-groups [hosts <hosts>] [groups <host-groups>]</pre>
Parameters	<code>hosts <hosts></code> 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. <code>groups <host-groups></code> 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. • HP-UX: The host uses Flat Space Addressing. • OpenVMS: The initiator does not allow LUN 0 to be assigned to a mapping. 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 host groups. <pre># show host-groups</pre> Show information about host groups HGroup1 and HGroup3. <pre># show host-groups groups HGroup1,HGroup3</pre>
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	<code>show host-phy-statistics</code>
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. <pre># show host-phy-statistics</pre>
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 basetype properties .
Minimum role	monitor
Syntax	<code>show host-port-statistics</code> <code>[ports <ports>]</code>
Parameters	<code>ports <ports></code> 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 <code>hostport_controller-ID-and-port-number</code>. 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 <i>year-month-day hour:minutes:seconds</i>, when these statistics were last reset, either by a user or by a controller restart.
Examples	Show live performance statistics for all host ports. <pre># show host-port-statistics</pre> Show live performance statistics for host port A1. <pre># show host-port-statistics ports a1</pre>
Basetypes	host-port-statistics status
See also	reset all-statistics reset 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 <code>SCSI INQUIRY</code> command or a <code>SCSI REPORT LUNS</code> 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	<pre>show initiators [hosts <hosts>] [<initiators>]</pre>
Parameters	<code>hosts <hosts></code> Optional. A comma-separated list of the names of host groups containing initiators for which to show information. If this parameter is omitted, information is shown for all initiators. <code><initiators></code> 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 • HP-UX: The host uses Flat Space Addressing. • OpenVMS: The initiator does not allow LUN 0 to be assigned to a mapping. 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. <pre># show initiators</pre> Show information about initiators in host group Host1 only. <pre># show initiators hosts Host1</pre>
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 IP address values and source
Examples	Show inquiry data for controller modules in the system. <pre># show inquiry</pre>
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. <pre># show ipv6-addresses controller a</pre>
Base types	ipv6-addresses 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	<pre>show ipv6-network-parameters</pre> [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	Firewall - Enabled: A network firewall is active. - Disabled: A network firewall is not currently active. Autoconfig - enabled: Uses an IPv6 address computed by SLAAC or assigned by a DHCPv6 server, depending on the network configuration. - 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. DHCPv6

	Shown if Autoconfig is enabled. The IP address assigned by a DHCPv6 server. SLAAC IP Address Shown if Autoconfig is enabled. The IP address computed by SLAAC. 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. <pre># show ipv6-network-parameters</pre>
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	<code>show iscsi-parameters</code>
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 ldap-parameters

Description	Shows LDAP settings.
Minimum role	monitor
Syntax	show ldap-parameters
Parameters	LDAP protocol Shows whether LDAP support is enabled or disabled. User Search Base Attributes that define where to start searching for users in the LDAP directory tree. LDAP Server The IP address or domain name of the primary LDAP server. LDAP Server Port The port number to use for communication with the primary LDAP server. Alternate LDAP Server The address of the alternate LDAP server. Alternate LDAP Server Port The port number to use for communication with the alternate LDAP server.
Examples	Show LDAP settings. <pre># show ldap-parameters</pre>
Basetypes	ldap-parameters status
See also	set ldap-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 information for all mapped 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	<pre>show maps [all] [initiator] [<IDs>]</pre>
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 volumes 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.*.* 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	Without the initiator parameter Serial Number The serial number of the volume. Name The name of the volume. Ports • The controller host ports to which the mapping applies. • Blank if not mapped or mapped as no-access. LUN • The 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: Read and write. • read-only: Read only. • no-access: No access (masked). • not-mapped: Not mapped. Identifier

	For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN). 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/ Profile • Standard: Default profile. • HP-UX: The host uses Flat Space Addressing. • OpenVMS: The initiator does not allow LUN 0 to be assigned to a mapping. With the initiator parameter ID For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN). Name See the section above. Profile See the section above. Volume The name of the volume. Serial Number See the section above. LUN See the section above. Access See the section above. Ports See the section above.
Examples	Show mappings for all volumes. <pre># show maps</pre> Show mapping information for all initiators. <pre># show maps initiator</pre>
Basetypes	volume-view host-group-view (with the initiator parameter) status
See also	show host-groups show initiators show volumes

show metrics-list

Description	Shows a list of all available types of metrics in the system.

If no parameters are specified, shows all the available types of metrics for each type of storage object that has metric fields defined.

Available metrics and applicable storage objects:

- `total-avg-response-time`: Average response time of an operation in microseconds. Operations include both reads and writes. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `total-bytes-per-second`: Sum of read bytes per second and write bytes per second. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `total-iops`: Sum of read IOPS and write IOPS. Applicable storage objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `total-max-response-time`: Sum of read maximum response time and write maximum response time. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `total-num-bytes`: Sum of read bytes and write bytes. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `read-io-count`: Number of read I/O operations. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `read-ahead-ops`: Number of times that read ahead pre-fetched data for host reads. Applicable objects: `controller`, `volume`.
- `read-avg-queue-depth`: Average number of pending read operations being serviced since the last sampling time. This value represents periods of activity only and excludes periods of inactivity. Applicable objects: `host-port`, `volume`.
- `read-avg-response-time`: I/O read average response time in microseconds. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `read-bytes-per-second`: Number of bytes read per second. Applicable storage objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `read-iops`: Number of I/Os per second. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `read-max-response-time`: Maximum I/O read response time in microseconds. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `read-num-bytes`: Number of bytes read since the last time this data point was sampled. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `small-destages`: Number of partial stripe destages. (These tend to be very inefficient compared to full stripe writes.) Applicable objects: `controller`, `volume`.
- `write-io-count`: Number of write I/O operations. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `write-avg-queue-depth`: Average number of pending write operations being serviced since the last sampling time. This value represents periods of activity only and excludes periods of inactivity. Applicable objects: `host-port`, `volume`.
- `write-avg-response-time`: I/O write average response time in microseconds. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `write-bytes-per-second`: Number of bytes written per second. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `write-cache-space`: Current size of write cache in 16KB chunks. Applicable objects: `controller`, `volume`.
- `write-cache-percent`: Percentage of write cache currently being used in tenths of a percent. Applicable objects: `controller`, `volume`.
- `write-full-stripe-destages`: Number of full stripe destages, which are the most efficient destage type. Applicable objects: `controller`, `volume`.
- `write-iops`: Number of I/Os per second. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `write-max-response-time`: Maximum I/O write response time in microseconds. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.
- `write-num-bytes`: Number of bytes written since the last time this data point was sampled. Applicable objects: `controller`, `host-port`, `pool`, `system`, `volume`.

Metrics for the system storage object are synthesized from data captured by controller storage objects.

Minimum role	monitor
Syntax	<pre>show metrics-list [database all dynamic historical] [pattern <string>] [range] [started] [type controller host-port pool system volume]</pre>
Parameters	database all dynamic historical Optional. Specifies to show all metrics or only dynamic metrics or historical metrics. If this parameter is omitted, all metrics are shown. pattern <string> Optional. Shows metrics 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. range Optional. Shows the start time and end time of available data points. type controller host-port pool system volume Optional. Filters the list to include only metrics available for the specified type of storage object. started Optional. Filters the list to include only those metrics that have been started by using the <code>start metrics</code> command.
Output	Name The metric name in the format <i>type.field-name.instance</i>, where <i>type</i> is a storage object, <i>field-name</i> is a specific measured property of that object, and <i>instance</i> is the name or serial number of that object. For example: <code>controller.total-iops.A</code>. If database <code>historical</code> is specified, the command shows average, maximum, and minimum entries for each calculated historical data point. These values are appended with an '@' symbol to the metric name. For example: <code>controller.totaliops@ Average.A</code>, <code>controller.total-iops@Max.A</code>, <code>controller.total-iops@Min.A</code>. Started Shows whether metric retention has been started. Start Time Shown by the <code>range</code> parameter. Shows the time when metric retention started. End Time Shown by the <code>range</code> parameter. Shows the time when metric retention ended.
Basetypes	metrics-list status
Examples	Show all metrics that have been started. <pre># show metrics-list started</pre> Show the range of start and end times for historical controller metrics.

	# show metrics-list range database dynamic type controller
See also	query metrics start metrics stop metrics

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. Ping Broadcast • Enabled: The system will respond to a broadcast ping. • Disabled: The system will not respond to a broadcast ping.
Examples	Show network parameters for each controller module. <pre># show network-parameters</pre>
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 <i>year-month-day hour:minutes:seconds</i> of the last message received from the NTP server, or none.
Examples	Show NTP status for the system. <pre># show ntp-status</pre>
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	<pre>show peer-connections [verify-links] <peer-connection-ID></pre>
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 <code>verify-links</code> parameter. The IDs of linked ports in the remote system. Reachable Local Links Shown by the <code>verify-links</code> parameter. The IDs of linked ports in the local system
Examples	Show information for all peer connections. <pre># show peer-connections</pre> Show information for peer connection Peer1. <pre># show peer-connections Peer1</pre> Show information for peer connection Peer1 and the ports that can be seen from each port. <pre># show peer-connections Peer1 verify-links</pre>
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	<pre>show pools [type linear virtual] <[pool]> type linear virtual</pre> 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. Blocksize The size of a block, in bytes. Total Size The total capacity of the pool. Avail The available capacity in the pool. Snap Size The pool capacity used by virtual snapshots OverCommit - Enabled: The pool uses thin provisioning, which means that more capacity can be allocated to volumes than physically exists in the pool. - Disabled: The capacity allocated to volumes when they are created 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. 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. <pre># show pools</pre>
Basetypes	pools status
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:

	<pre>show pool-statistics [pools <pool>] [tier performance standard archive readcache]</pre> To show historical statistics: <pre>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>"]</pre>
Parameters	all Optional. Specifies to show the full set of historical performance metrics. If you specify this parameter you must also specify the historical parameter. If the all parameter is omitted, the default set of performance metrics is 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.
Output	Live Name The name of the pool. Pages Allocated per Min 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

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 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, calculated over the interval since these statistics were last requested or reset.

Read Resp Time

Shown by the `all` parameter. Average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.

Write Resp Time

Shown by the `all` parameter. Average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.

Historical

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 <code>all</code> 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 <code>all</code> parameter. The data transfer rate, in bytes per second, for read operations since the last sampling time.
Write B/s
Shown by the <code>all</code> 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 <i>year-month-day hour:minutes:seconds</i> , 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 <i>year-month-day hour:minutes:seconds</i> , when the data sample was taken.

Examples	Show live statistics for both pools. <pre># show pool-statistics</pre> Show historical statistics from a specified date and time range for pool A. <pre># show pool-statistics pools A historical time-range "start 2020-06-01 4:40 PM end 2020-06-01 5:00 PM"</pre> Show all samples of historical statistics for the Standard tier in pool A. <pre># show pool-statistics historical all pools A tier standard</pre>
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	<pre>show ports</pre> <pre>[detail]</pre> <pre>[port]</pre>
Parmeters	detail Optional. This parameter shows additional detail about the port status, including SFP information. port Optional. Shows information about the specified port only. Specify a controller ID and port number (see Examples). If this input is omitted, information is shown for all ports.
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 Fibre Channel 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, 32Gb, 16Gb, or 8Gb
- 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.

Related FC data fields are displayed if the `detail` parameter is specified, including SFP status, part number, configured speed, actual speed, and supported link speeds for the qualified SFP option used in each port.

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. <pre># show ports</pre> Show detailed information about host ports in each controller module. <pre># show ports detail</pre> Show information about a single host port in a specific controller module. <pre># show ports A1</pre> or <pre># show port A1</pre>
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, if available. Part Number The power supply part number, if available. Name The power supply identifier and location. Firmware Version 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. <pre># show power-supplies</pre>
Basetypes	power-supplies 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. Service Location Protocol (SLP) Shows whether the SLP interface is enabled or disabled. File Transfer Protocol (FTP) Shows whether the insecure interface for installing firmware updates, installing security certificates and keys and downloading logs is enabled or disabled. Secure File Transfer Protocol (SFTP) Shows whether the secure 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. 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. <pre># show protocols</pre>
Basetypes	security-communications-protocols status
See also	set protocols

show provisioning

Description	Shows information about how the system is provisioned. This command shows the associations between controllers, disks, 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	<pre>show provisioning [disks <disks> luns <LUNs> pool <pools> ports <ports> volumes <volumes>] [no-mapping] [unhealthy]</pre>
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. 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 pools whose health is not OK. If this parameter is omitted, provisioning information is shown for all pools.
Output	Volume information: Volume • Volume name. • Blank if the pool does not have a volume. WWN • Volume World Wide Name. • Blank if the pool does not have a volume. Ctlr Owning controller of the pool. Disks Shorthand list of the disks within a pool. Pool Pool 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. Identifier • For an FC initiator, its WWPN. • or a SAS initiator, its WWPN. • For an iSCSI initiator, its node name (typically the IQN). Nickname Host nickname. Profile • Standard: Default profile. • HP-UX: The host uses Flat Space Addressing. • OpenVMS: The initiator does not allow LUN 0 to be assigned to a mapping. Standard: Default profile.
Examples	Show provisioning for the system. <pre># show provisioning</pre> Show provisioning for all unhealthy disk groups. <pre># show provisioning unhealthy</pre>
Basetypes	provisioning status
See also	show disk-groups show disks show maps show pools

show redundancy-mode

Description	Shows the redundancy status of the system.
Minimum role	monitor
Syntax	<code>show redundancy-mode</code>
Output	Controller Redundancy Mode Shows the system's operating mode, 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.

Controller Redundancy Status

- **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.

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:** The partner Management Controller is responding normally.
- **Not Operational:** The local Management Controller has established communication with the partner Management Controller, but the partner is not responding because it's not currently in active-active or failed-over state.
- **Not Communicating:** The partner Management Controller is not ready to communicate.
- **Unknown:** The operational status of the partner Management Controller cannot be determined.

System Ready

Shows whether the system is ready for running a script.

- **Ready:** The system is ready.
- **Not Ready:** The system is not ready.

Local Controller Ready

Shows the local controller's contribution towards System Ready.

- **Ready:** The local controller is ready.
- **Storage Controller is Not Ready:** The Storage Controller is not ready.
- **Management Controller is Not Ready:** The Management Controller is not ready.
- **Activity is currently in progress:** A partner firmware update, firmware installation, or log retrieval is in progress. Wait for that operation to complete and try again.

Local Controller Reason

The explanation for Local Controller Ready.

Other Controller Ready

Shows the partner controller's contribution towards System Ready.

- **Ready:** The partner controller is ready.
- **Storage Controller is Not Ready:** The Storage Controller is not ready.
- **Management Controller is Not Ready:** The Management Controller is not ready.
- **Activity is currently in progress:** A partner firmware update, firmware installation, or log retrieval is in progress. Wait for that operation to complete and try again.

Other Controller Reason

The explanation for Other Controller Ready

Examples

Show the redundancy status of the system.

	# show redundancy-mode
Basetypes	redundancy status

show remote-systems

Description	Shows information about remote systems associated with the local system.
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. A name that includes a space must be enclosed in double quotes. An address can be an IPv4 address, IPv6 address, or FQDN.
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 standard or 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 <i>year-month-day hour:minutes:seconds</i> (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 <code>Not Connected</code> .
Examples	Show information about remote system <code>System2</code> . <pre># show remote-systems System2</pre>
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 basetype properties
Minimum role	monitor
Syntax	<pre>show replication-sets</pre> <pre>[<replication-set-ID>]</pre>
Parameters	<pre><replication-set-ID></pre> 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 <code>.*</code> notation. Secondary Volume The secondary volume name. If it is a volume group, it uses the <code>.*</code> 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.
- `Failed Over`: The replication set's secondary system has allowed direct access to the secondary volume or volume group because the primary system is not operational. In this state no replications will occur, even if the primary system becomes operational and communication is restored.
- `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.

Failback In Progress

- `True`: A failback-restore process for this replication set has started and is in progress.
- `False`: The failback-restore process is complete on both systems.

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-set status
See also	create replication-set delete replication-set recover 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	<pre>show replication-snapshot-history [<replication-set-ID>]</pre>
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. <pre># show replication-snapshot-history</pre> Show snapshot-history information for replication set RS1. <pre># show replication-snapshot-history RS1</pre>
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	<code>show sas-link-health</code>
Output	Encl The enclosure ID. Ctlr The ID of the controller module or expansion module. Name The expansion port name. 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. <pre># show sas-link-health</pre>
Basetypes	expander-ports status

show schedules

Description	Shows information about task schedules.
Minimum role	monitor
Syntax	<pre>show schedules [detail] [<schedule-name>]</pre>
Parameters	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. <pre>Schedule Name</pre> Shown by the detail parameter. The schedule name. <pre>Specification</pre> Shown by default. The schedule settings for running the associated task. <pre>Schedule Specification</pre> 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 <i>year-month-day hour : minutes : seconds</i> (UTC), when the schedule will next run. <pre>Last Initiated Time</pre>

	Shown by the <code>detail</code> parameter. The date and time, in the format <i>year-month-day hour : minutes : seconds</i> (UTC), when the schedule was last run. <code>Task To Run</code> The name of the task that the schedule runs. <code>Error Message</code> • If an error occurred while processing the task, the error message. • Blank if no error occurred. <code>Tasks</code> Shown by the <code>detail</code> parameter. Information about tasks and task details as shown by the <code>show tasks</code> command.
Examples	Show information about all task schedules. <pre># show schedules</pre> Show information about schedule <code>Sched2</code>. <pre># show schedules Sched2</pre>
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 temperature, voltage, and current for applicable components, and voltage, charge, capacitance, and resistance for the controller module supercapacitor pack. For temperature and voltage ranges (both normal and error), see your product's Deployment Guide.
Minimum role	monitor
Syntax	<code>show sensor-status</code>
Output	<code>Encl</code> The enclosure ID. <code>Drawer</code> The disk drawer ID <code>Sensor Name</code> The sensor name and location. <code>Value</code> • For a sensor, its value. • For Overall Unit Status, one of the status values below. <code>Status</code> • 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 drawer-sensors status

show service-tag-info

Description	Shows the storage system's service tag identifier. Each enclosure in the storage system has a unique service tag ID, which will be shown by this command.
Minimum role	monitor
Syntax	show service-tag-info
Output	Encl The number of the enclosure that the service tag ID applies to. Service Tag 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	standard
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 <code>detail</code> parameter. Shows whether the session is active or expired. Timeout Shown by the <code>detail</code> 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 <code>detail</code> parameter. The date and time when the session started. Last Access Shown by the <code>detail</code> 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. <pre># show sessions</pre>
Basetypes	sessions status

show shutdown-status

Description	Shows whether each Storage Controller is active or shut down.
Minimum role	monitor
Syntax	<code>show shutdown-status</code>
Output	Storage Controller A • up: The controller is operational. • down: The controller is shut down. • not installed: The controller is not installed. Storage Controller B • up: The controller is operational. • down: The controller is shut down. • not installed: The controller is not installed. Other MC Status The operational status of the Management Controller in the partner controller. This is not factored into system health • Operational: The partner Management Controller is responding normally. • Not Operational: The local Management Controller has established communication with the partner Management Controller, but the partner is not responding because it's not currently in active-active or failed-over state. • Not Communicating: The partner Management Controller is not ready to communicate. • Unknown: The operational status of the partner Management Controller cannot be determined.

Examples	Show the shutdown status of each controller. <code># show shutdown-status</code>
Basetypes	show-other-MC-status shutdown-status status
See also	restart mc restart sc shutdown

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	<code>show snapshots</code> <code>[pattern <string>]</code> <code>[pool <pool>]</code> <code>[type standard replication all]</code> <code>[volume <volume>]</code>
Parameters	<code>pattern <string></code> 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. <code>pool <pool></code> 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. <code>type standard replication all</code> Optional. Shows only standard snapshots, only replication snapshots, or snapshots of all types. If this parameter is omitted, snapshots of all types are shown. <code>volume <volume></code> 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. Name The name of the snapshot.

	<code>Creation Date/Time</code> The date and time when the snapshot was prepared or committed. <code>Status</code> • <code>Available</code> • <code>Unavailable</code>: See the <code>Status-Reason</code> value. <code>Status-Reason</code> Shows N/A for <code>Available</code> status, or one of the following reasons for <code>Unavailable</code> status: • <code>snapshot not found</code> • <code>master volume not found</code> • <code>snapshot pending (not yet committed)</code> • <code>master volume not accessible</code> • <code>Volume copy with modified data is in progress</code> • <code>Unknown reason</code> <code>Parent Volume</code> The name of the volume of which the snapshot was taken. <code>Base Vol</code> 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. <code>Snaps</code> The number of child snapshots (snapshots taken of this snapshot). <code>TreeSnaps</code> 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. <code>Snap-Pool</code> Not applicable. <code>Snap Data</code> The total amount of write data associated with the snapshot. <code>Unique Data</code> The amount of write data that is unique to the snapshot. <code>Shared Data</code> The amount of write data that is shared between this snapshot and other snapshots. <code>Retention Priority</code> The retention priority for the snapshot. • <code>never-delete</code>: Snapshots will never be deleted. • <code>high</code>: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted. • <code>medium</code>: Snapshots may be deleted after all eligible low-priority snapshots have been deleted. • <code>low</code>: 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. <pre># show snapshots</pre> Show information about snapshots of volume <code>vol2</code>. <pre># show snapshots volume vol2</pre> Show snapshots whose names include <code>snap</code> followed by an underscore and a two-digit number — such as <code>VolAsnap_01</code> or <code>snap_10</code>, but not <code>snapVolA_01</code> or <code>Snap_1</code>. <pre># show snapshots pattern *snap_[0-9][0-9]</pre>

Basetypes	snapshots status
See also	show pools show volumes

show snapshot-space

Description	Shows snapshot-space settings for each virtual pool. This includes space used by replication snapshots.
Minimum role	monitor
Syntax	<code>show snapshot-space</code>
Output	<code>Pool</code> The pool for which information is displayed (A or B). <code>Limit (%Pool)</code> The percentage of the pool that can be used for snapshots (the snapshot space). <code>Limit Size</code> The actual size of the snapshot space. <code>Allocated (%Pool)</code> The percentage of the pool currently used by snapshots. <code>Allocated (%Snapshot Space)</code> The percentage of the snapshot space currently used by snapshots. <code>Allocated Size</code> The actual amount of space currently used by snapshots. <code>Low Threshold (%Snapshot Space)</code> A percentage of the snapshot space designated as the low threshold. <code>Middle Threshold (%Snapshot Space)</code> A percentage of the snapshot space designated as the middle threshold. <code>High Threshold (%Snapshot Space)</code> A percentage of the snapshot space designated as the high threshold. <code>Limit Policy</code> The limit policy for when the percentage of the pool designated for snapshots is reached. • <code>Notify Only</code>: When the snapshot space is reached an event is generated and logged. • <code>Delete Snapshots</code>: 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. <pre># show snapshot-space</pre>
Basetypes	snap-space status
See also	set snapshot-space show pools

show snmp-parameters

Description	Shows SNMP settings for event notification.
Minimum role	monitor
Syntax	<code>show snmp-parameters</code>
Output	SNMP Trap Notification Level • <code>crit</code>: Sends notifications for Critical events only. • <code>error</code>: Sends notifications for Error and Critical events. • <code>warn</code>: Sends notifications for Warning, Error, and Critical events. • <code>resolved</code>: Sends notifications for Resolved, Warning, Error, and Critical events. • <code>info</code>: Sends notifications for all events. • <code>none</code>: 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 standard or 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 standard or manage role. Alert Notification Shows whether the system will send SNMP notifications for alerts. • <code>all</code>: The system will send SNMP notifications for alerts. • <code>none</code>: The system will not send SNMP notifications for alerts.
Examples	Show SNMP notification settings. <pre># show snmp-parameters</pre>
Basetypes	snmp-parameters status
See also	set snmp-parameters set protocols show protocols

show support-assist

Description	Shows information about the SupportAssist feature. Additionally, use this command to display the SupportAssist end-use license agreement (EULA) by using the <code>eula</code> parameter.
Minimum role	monitor
Syntax	<code>show support-assist</code> <code>eula</code>
Parameters	<code>eula</code> Displays the full text of the end-use license agreement (EULA).

	i NOTE: Before you can enable SupportAssist, you must review the EULA by executing <code>show support-assist</code> with the <code>eula</code> parameter: <code># show support-assist eula</code>
Output	SupportAssist status: SupportAssist State - Running – The service is enabled. - Disabled – The service is disabled 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. - Update: This mode is enabled automatically during firmware updates. Auto-case Creation - Enabled: The Dell support server automatically creates support cases when certain error conditions occur on the system. - Disabled: Support cases are not created automatically. apex-aiops-observability - Enabled: This features periodically sends configuration and performance metrics to the SupportAssist server for predictive analysis. - Disabled: No additional data is sent. Connection Preference - Direct: The system connects directly to the SupportAssist server. - Gateway: Connections are made through a user-defined gateway. Gateway Endpoints Displays a list of up to three user-defined gateway URLs. Proxy Information Displays settings for proxy connections. - Proxy State - Enabled: Use of a proxy for communication is enabled. - Disabled: Use of a proxy for communication is disabled. - Protocol – The communication protocol: HTTP. - Host – The IP address or name of a proxy host. - Ports – The port number to use on the proxy host. - User Name – The proxy user name to use to access the proxy server. Output with the <code>eula</code> parameter Displays the full text of the end-use license agreement (EULA).
Examples	Show information about the SupportAssist feature. <pre># show support-assist</pre>
Basetypes	gateway-endpoints proxy-information support-assist status
See also	check support-assist-connection check support-assist-updates send support-assist-logs set support-assist

```

set support-assist-authentication
set support-assist-connection
set support-assist-contact
set support-assist-proxy
show support-assist-contact
show support-assist-telemetry-status

```

show support-assist-contact

Description	Shows the contact information that's been sent to the SupportAssist server. The output displays information for the primary and secondary contacts if applicable, including name, email address, phone number, and preferred contact language. Use the <code>set support-assist-contact</code> command to update any of this information.
Minimum role	monitor
Syntax	<code>show support-assist-contact</code>
Output	Contact Status • Error: A problem occurred during transmission of contact information. • Initiated: Contact information transmission to the SupportAssist server has been initiated and is awaiting response from the server. • Success: Contact information was transmitted successfully to the SupportAssist server. Primary Contact & Secondary Contact Information for the primary contact is listed first, followed by information for the secondary contact. The following fields are shown for each: • First Name • Last Name • Email Address • Phone Number • Preferred Language
Examples	Display information for SupportAssist contacts. <pre># show support-assist-contact</pre>
Basetypes	ch-contact-info-primary ch-contact-info-secondary ch-contact-status status
See also	check support-assist-connection check support-assist-updates send support-assist-logs set support-assist set support-assist-authentication set support-assist-connection set support-assist-contact set support-assist-proxy show support-assist show support-assist-telemetry-status

show support-assist-telemetry-status

Description	Shows the status of the latest transaction of all the types of data sent to the SupportAssist server. Information that can be sent includes system logs, events, topology, test connectivity data, and apex-aiops-observability configuration information and statistics.
Minimum role	monitor
Syntax	<code>show support-assist-telemetry-status</code>
Output	Each output category displays Latest Upload Status and Latest Upload Time for the indicated data. The following categories are reported: • System Logs • Events • Topology • Test Connectivity • apex-aiops-observability Config • apex-aiops-observability Statistics If SupportAssist has not been configured or no connection has been attempted, Latest Upload Status for each category is blank and Latest Upload Time displays N/A.
Examples	Show information about when telemetry was last sent to the SupportAssist server. <pre># show support-assist-telemetry-status</pre>
Basetypes	support-assist-telemetry status
See also	check support-assist-connection check support-assist-updates send support-assist-logs set support-assist set support-assist-authentication set support-assist-connection set support-assist-contact set support-assist-proxy show support-assist show support-assist-contact

show syslog-parameters

Description	Shows syslog notification parameters for events and managed log.
Minimum role	monitor
Syntax	<code>show syslog-parameters</code>
Output	Syslog Host 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: • <code>crit</code>: Sends notifications for Critical events only.

	• <code>error</code>: Sends notifications for Error and Critical events. • <code>warn</code>: Sends notifications for Warning, Error, and Critical events. • <code>resolved</code>: Sends notifications for Resolved, Warning, Error, and Critical events. • <code>info</code>: Sends notifications for all events. • <code>none</code>: Disables syslog notification and clears the settings. <code>Syslog Host Port</code> The port on which the remote syslog facility is expected to listen for notifications. <code>Alert Notification</code> Shows the filter for which alert notifications will be sent: • <code>all</code>: Sends notifications for all alerts. • <code>none</code>: Disables email notification for alerts.
Examples	Show settings for remote syslog notification. <pre># show syslog-parameters</pre>
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	<pre>show system</pre> <pre>[detail]</pre>
Parameters	<code>detail</code> Optional. This parameter shows additional detail about the system.
Output	<code>System Name</code> The name of the system. <code>System Contact</code> The name of the person who administers the system. <code>System Location</code> The location of the system. <code>System Information</code> A brief description of what the system is used for or how it is configured. <code>Midplane Serial Number</code> The serial number of the controller enclosure midplane. <code>Vendor Name</code> The vendor name. <code>Product ID</code> The product model identifier. <code>Product Brand</code> 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 Health 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: The partner Management Controller is responding normally. • Not Operational: The local Management Controller has established communication with the partner Management Controller, but the partner is not responding because it's not currently in active-active or failed-over state. • Not Communicating: The partner Management Controller is not ready to communicate. • Unknown: The operational status of the partner Management Controller cannot be determined. 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. <pre># show system</pre>
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	<code>show system-parameters</code>
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 The number of linear disk groups that the system supports. Maximum LUNs The number of LUNs that the system supports. Maximum Linear Disk Groups per Controller The number of linear 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. Maximum number of ADAPT Disk Groups per Controller The maximum number of ADAPT disk groups that each controller supports.
Examples	Show settings and configuration limits for the storage system. <pre># show system-parameters</pre>
Base types	system-parameters-table

	status
See also	show system

show tasks

Description	Shows information about tasks.
Minimum role	monitor
Syntax	<pre>show tasks [detail] [<task-name>]</pre>
Parameters	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: Start process. Goes immediately to VerifyVolume. • VerifyVolume: Ensure the volume exists and is a type of volume that can have a snapshot.

- **CreateName:** Build a unique name for the new snapshot using prefix and sequence number.
- **PlanCreateSnap:** Take the snapshot.
- **VerifySnap:** Ensure the new snapshot exists.
- **InspectRetention:** Check whether the snapshot retention count is exceeded.
- **FindOldestSnap:** Determine which is the oldest retained snapshot.
- **UnmapSnap:** Unmap the oldest snapshot so it can be reset.
- **ResetSnap:** Reset the oldest snapshot so it can be reused.
- **RenameSnap:** Rename the oldest snapshot to the new snapshot name.

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 reset and renamed.

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

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:** Start process. Goes immediately to VerifySnap.
- **VerifySnap:** Ensure the snapshot exists.
- **ResetSnap:** Reset the specified snapshot.

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.

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:

- Start: Start process. Goes immediately to VerifySnap.
- PlanCreateRep: Flush the replication set.
- Replicate : Replicate the volumes in the replication set.
- VerifyRunning: Ensure the new replication has started.

Error Message

- If an error occurred while processing the task, the error message.
- Blank if no error has occurred.

Replication Set Name

The name of the replication set.

Replication Set Serial Number

The serial number of the replication set.

Replicate Last Snapshot

If True, the task is set to replicate the most recent snapshot of the primary volume.

EnabledDSD task, detail

Task Name

The name of the task.

Task Type

EnabledDSD

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. <pre># show tasks</pre> Show information about task Task1. <pre># show tasks Task1</pre>
Basetypes	tasks status
See also	create schedule create task delete task set task show schedules

show tiers

Description	Shows information about tiers.
Minimum role	monitor
Syntax	<pre>show tiers</pre> <pre>tier performance standard archive readcache all</pre>
Parameters	<pre>tier performance standard archive readcache all</pre> 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. <code>Alloc Size</code> The amount of space currently allocated to volumes in the tier. <code>Available Size</code> The available capacity in the tier. <code>Affinity Size</code> The total size of volumes configured to have affinity for that tier.
Examples	Show information about all tiers. <pre># show tiers tier all</pre> Show information about the Standard tier. <pre># show tiers tier standard</pre>
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	<pre>show tier-statistics</pre> <code>[pool <pool>]</code> <code>tier performance standard archive readcache all</code>
Parameters	<code>pool <pool></code> 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. <code>tier performance standard archive readcache all</code> Specifies the tier for which to show statistics.
Output	<code>Pool</code> The name of the pool. <code>Tier</code> The name of the tier. <code>Pages Allocated per Min</code> The rate, in pages per minute, at which pages are allocated to volumes in the tier because they need more space to store data. <code>Pages Reclaimed</code> The number of 4 MB pages that have been automatically reclaimed and deallocated because they are empty (they contain only zeroes for data). <code>Pages Unmapped per Minute</code>

	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 The average response time, in microseconds, for read operations since the last sampling time. Write Resp Time The average response time, in microseconds, for write operations since the last sampling time.
Examples	Show statistics for all tiers. <pre># show tier-statistics tier all</pre> Show statistics for the Standard tier in pool A. <pre># show tier-statistics pool A tier standard</pre>
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	<code>show unwritable-cache</code>
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. <pre># show unwritable-cache</pre>
Basetypes	unwritable-cache status
See also	clear cache

show user-groups

Description	Shows configured LDAP user accounts. Properties shown only in API output are described in API basetype properties.
Minimum role	monitor
Syntax	<code>show user-groups</code> <code>[<user-group-name>]</code>
Parameters	<code><user-group-name></code> Optional. Shows settings for the specified user group only. If this parameter is omitted, settings are shown for all user groups.
Output	Name The user group name. Roles • <code>monitor</code>: The user can view but not change system settings. • <code>standard</code>: User can view and change system settings except: configuring local users; configuring LDAP; performing write operations through FTP or SFTP; performing file uploads from the PowerVault Manager; using the <code>restore defaults</code> command. • <code>manage</code>: The user can view and change system settings. • <code>diagnostic</code>: The user can view and change system settings. User Type The user group type: LDAP. Locale The display language. WBI • <code>x</code>: 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 SFTP interface. • (blank): The user cannot access this interface.
Examples	Show information about all user groups. <pre># show user-groups</pre> Show information about user group StorageAdmins. <pre># show user-groups StorageAdmins</pre>
Base types	usergroups status
See also	create user-group delete user-group set user-group

show users

Description	Shows configured user accounts.
Minimum role	monitor
Syntax	<pre>show users</pre> <pre>[show-snmp-password]</pre> <pre>[<user>]</pre>
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. • standard: User can view and change system settings except: configuring local users; configuring LDAP: performing write operations through FTP or SFTP; performing file uploads from the PowerVault Manager; using the <code>restore defaults</code> command. • 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

	• <code>x</code>: The user can access the PowerVault Manager web-browser interface. • (blank): The user cannot access this interface. CLI • <code>x</code>: The user can access the command-line interface. • (blank): The user cannot access this interface. FTP • <code>x</code>: The user can access the FTP or SFTP interface. • (blank): The user cannot access this interface. SNMP • <code>x</code>: The user can access the SNMPv3 interface. • (blank): The user cannot access this interface. 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. Trap Host Port The SNMP trap destination port of the host for an SNMPv3 user that can receive trap notifications.
Examples	Show information about all users. <pre># show users</pre> Show information about user JSmith. <pre># show users JSmith</pre> As a user with the manage role, show information—including SNMP passwords—for SNMPv3 user Traps. <pre># show users Traps show-snmp-password</pre>
Base types	users status
See also	create user delete user set user

show versions

Description	Shows firmware and hardware version information for the system.
Minimum role	monitor
Syntax	<code>show versions</code>

	<pre>[detail] [firmware active available] [frus]</pre>
Parameters	<pre>detail</pre> 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. <pre>firmware active available</pre> Optional. Shows information about the active bundle, all available installed bundles, or a specific bundle version. • <code>active</code>: Accessible to users having any role to view the active bundle. • <code>available</code>: Accessible to users having the <code>manage</code> role to view available bundles. <pre>frus</pre> 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. <pre># show versions</pre> Show detailed version information for each controller module. <pre># show versions detail</pre> Show version information for FRUs in each enclosure. <pre># show versions frus</pre> Show version information for all installed bundles. <pre># show versions firmware available</pre>
Basetypes	<pre>versions firmware-versions fru-versions status</pre>
See also	<pre>show inquiry</pre>

show volume-copies

Description	Shows information about in-progress copy volume operations.
Minimum role	monitor
Syntax	<code>show volume-copies</code>
Output	<pre>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</pre>

	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. <pre># show volume-copies</pre>
Base types	copy volume 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	<pre>show volume-groups</pre> <pre>[<volume-groups>]</pre>
Parameters	<volume-groups> Optional. A comma-separated list of the names of volume groups for which to show information. If this parameter is omitted, information is shown for all 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 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. <pre># show volume-groups</pre> Show information about volume groups VGroup1 and VGroup2. <pre># show volume-groups VGroup1,VGroup2</pre>
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	<pre>show volume-names</pre> <pre>[<volumes>]</pre>
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. <pre># show volume-names</pre>
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	<pre>show volume-reservations [all <volumes>]</pre>
Parameters	<code>all <volumes></code> Optional. 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. If this parameter is omitted, information is shown for all volumes.
Output	Properties are described in alphabetical order. <code>Host ID</code> For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN). <code>Key</code> The reservation key, shown as a hexadecimal value. <code>Name</code> The name of the volume. <code>PGR Generation</code> The generation of the volume reservation, shown as a hexadecimal value. <code>Ports</code> The controller host-port identifiers. <code>Reservation Type</code> • <code>Write Exclusive</code>: Write commands are only allowed for a single reservation holder. • <code>Exclusive Access</code>: Certain access (read, write) commands are only allowed for a single reservation holder. • <code>Write Exclusive - Registrants Only</code>: Write commands are only allowed for registered hosts. There is a single reservation holder. • <code>Exclusive Access - Registrants Only</code>: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder. • <code>Write Exclusive - All Registrants</code>: Write commands are only allowed for registered hosts. There is a single reservation holder. • <code>Exclusive Access - All Registrants</code>: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder. • <code>Undefined</code>: The volume has no persistent reservations. <code>Scope</code> The reservation scope, Logical Unit. <code>Serial Number</code> 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. <pre># show volume-reservations</pre> Show reservations for volume v1. <pre># show volume-reservations v1</pre>
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	<pre>show volume-statistics</pre> <pre>[<volumes>]</pre>
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 <i>year - month - day hour : minutes :seconds</i>, when these statistics were last reset, either by a user or by a controller restart.
Examples	Show live performance statistics for all volumes. <pre># show volume-statistics</pre> Show live performance statistics for volume v0001. <pre># show volume-statistics v0001</pre>
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	<pre>show volumes [details] [pattern <string>] [pool <pool>] [type base standard snapshot primary-volume secondary-volume] [<volumes>]</pre>
Parameters	<code>details</code> Optional. Shows additional information about the volumes. <code>pattern <string></code>

	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, <code>Vol1??</code> will find names starting with <code>Vol1</code> that are five characters long. [] Matches any character within the brackets, except a hyphen. Alphabetic characters are case sensitive. For example, <code>[123]</code> matches 1, 2, or 3. Use a hyphen between two characters to specify a range. For example, <code>[0-9]</code> matches any one digit. You can combine the list and range forms. For example, <code>[xy1-3]</code> matches <code>x</code> or <code>y</code> (but not <code>x</code> or <code>y</code>), or 1, 2, or 3. <code>pool <pool></code> Optional. The name or serial number of the pool that contains the volumes for which to show information. <code>type all base standard snapshot primary-volume secondary-volume</code> Optional. • <code>base</code>: Show only virtual volumes that are not snapshots of any other volume. • <code>snapshot</code>: Show only snapshots. • <code>standard</code>: Show only standard volumes. • <code>primary-volume</code>: Show only primary volumes. • <code>secondary-volume</code>: Show only secondary volumes. If this parameter is omitted, all volumes are shown. <code><volumes></code> 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: • <code>standard</code>: 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. • <code>standard-atomic-write</code>: This controller cache mode includes the standardmode features but also guarantees that if a failure (such as I/O being aborted or a controller failure) interrupts a data transfer between a host and the storage system, the controller cache contains either all the old data or all the new data, not a mix of old and new data. This option has a slight performance cost because it maintains a secondary copy of data in cache so that if a data transfer is not completed, the old cache data can be restored. • <code>cache-hit-atomic-write</code>: This controller cache mode includes the cache-hitmode features but also guarantees that if a failure (such as I/O being aborted or a controller failure) interrupts a data transfer between a host and the storage system, the controller cache contains either all the old data or all the new data, not a mix of old and new data. This option has a slight performance cost because it maintains a secondary copy of data in cache so that if a data transfer is not completed, the old cache data can be restored. Class • <code>Linear</code>: The volume is in a linear pool. • <code>Virtual</code>: The volume is in a virtual pool. Desc Shown by the details parameter. • For OpenVMS, a numeric value (set with the <code>create volume</code> or <code>set volume</code> command) that identifies the volume to an OpenVMS host.

- Blank if not set.

Health

- OK

Large Virtual Extents

Shown by the `details` parameter. 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`: Optimized page allocation is disabled. This is the default.
- `enabled`: Optimized page allocation is enabled.

Metadata In Use

Shown by the `details` parameter. The amount of pool metadata currently being used by the volume.

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.

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. 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. Total Size The total size of the volume. Type • base: Base volume • snapshot: Snapshot volume • standard: Standard volume WR Policy Shown by the <code>details</code> 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 <code>details</code> parameter. The World Wide Name of the volume
Examples	Show information about all volumes. <pre># show volumes</pre> Show detailed information for volume <code>volA</code>. <pre># show volumes details volA</pre> Show volumes whose names start with <code>Vol</code> followed by any single character, an underscore, and a two-digit number — such as <code>VolA_01</code> or <code>Vol13_10</code>, but not <code>volA_01</code> or <code>Vol13_1</code>. <pre># show volumes pattern Vol?[0-9][0-9]</pre>
Basetypes	volumes status
See also	create volume delete volumes expand volume set volume show disk-groups show maps show pools

show workload

Description	Calculates the system's I/O workload, and shows the relationship between the workload and the amount of storage capacity used. This data reveals how much capacity is frequently accessed over time ("hot"). You can use this information to determine how system performance may benefit from implementing a tier of fast SSDs, instead of slower spinning disks, for some or all of that capacity. Users often see the greatest performance benefits when the SSD tier is sized to handle 80% or more of the I/O workload.

	Calculations are based on user-specified settings and up to eight days of usage data captured by the system. The storage system must be in a stable state for a minimum of two days to generate complete data. For a graphical view of workload data, see the I/O workload panel in the PowerVault Manager. The workload history does not persist beyond a controller restart.  NOTE: The suggested capacities may not apply to heavily streaming workloads.
Minimum role	monitor
Syntax	<pre>show workload calc-type peak average io-type reads writes combined controller a b [target-pct <target-percentages>]</pre>
Parameters	<code>calc-type peak average</code> Specifies whether to base the calculations on either the peak values saved in the usage data or the average values. For calculations, the pool is divided into equal bins of LBAs. Each sample contains readings for all bins. There are multiple samples taken per day. To calculate average, the sum of the readings of a bin are divided by the number of samples. To calculate peak, the largest bin value from the collection of samples is taken, instead. This leaves one value for each bin whether average or peak was selected. From there, workload calculations are made using the bin numbers as input. <code>io-type reads writes combined</code> Specifies to limit the data used for calculations to small read I/Os only, small write I/Os only, or the combined total of small read and small write I/Os. Small I/Os are random access operations, as opposed to large I/Os which are sequential access operations. <code>controller a b</code> Specifies whether to base calculations on data from the pool owned by controller A or B. <code>target-pct target-percentages</code> Optional. Default workload calculations are based on low, mid, and high percentages of capacity: 50%, 80%, and 100%. This parameter overrides any or all calculations with your own percentages expressed as whole numbers. Enter a comma-separated list of up to three values. If a value is not specified, the corresponding default will be used. For example, entering 65,85,95 would set percentages to 65%, 80%, and 95%. Entering % characters is optional.
Output	Current SSD Space Current SSD capacity allocated to the pool formatted to use the current base, precision, and units. Pool The pool for which the calculations are based: A or B. Calculation Type Either Peak or Average. I/O Type Calculations are based on either Reads, Writes, or the Combined total of reads and writes. For each data sample: Start Sample Time: Datestamp for the first data sample used in calculations. End Sample Time: Datestamp for the last data sample used in calculations. <low%>, <mid%>, <high%>: Columns showing calculated capacities based on the three percentage values specified in the <code>target-pct</code> parameter or their corresponding defaults. The column headings show the respective percentage values. If less than 90% of the expected data samples are available for calculation, the calculated capacity will be N/A. Samples may be unavailable for rare reasons including controller failover conditions.

Examples	Calculate the peak workload of small read I/Os for the pool owned by controller A, with a low capacity target of 70% instead of the default 50%. The results indicate that over the time and capacity ranges, about 1600GB of storage is frequently accessed, making it a good candidate for use of SSDs. <pre># show workload calc-type peak controller a io-type reads target-pct 70</pre>
Basetypes	workload status
See also	show disks show pools show volumes

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. Perform a shut down before removing a controller module or powering down the system.
Minimum role	standard
Syntax	<pre>Shutdown</pre> [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. <pre># shutdown a</pre>
See also	restart mc restart sc show shutdown-status

start metrics

Description	Starts retention of specified dynamic metrics. The system automatically retains historical metrics and the last 5 minutes of all dynamic metrics. This command retains select dynamic metrics beyond 5 minutes, to a maximum of 4 hours of data points. It retains a few hours of 5-second-sampled data points. The oldest data points are automatically deleted as internal storage gets full. Repeatedly calling this command is additive. That is, metrics are added to the existing list of metrics without clearing the list.
Minimum role	monitor
Syntax	<pre>start metrics</pre>

	<code>metrics-list</code>
Parameters	<code>metrics-list</code> A comma-separated list of individual dynamic metrics instances to start retaining.
Examples	Start retaining individual dynamic metrics. <pre># start metrics controller.read-ops.A,controller.read-ops.B</pre>
See also	query metrics show metrics-list stop metrics

stop metrics

Description	Stops data retention for specified dynamic metrics. This command does not delete persisted data points. The oldest data points are automatically deleted as internal storage gets full.  NOTE: Running this command without a parameter will stop data retention for all current metrics.
Minimum role	monitor
Syntax	<pre>stop metrics</pre> <pre><metrics list></pre>
Parameters	<code>metrics list</code> A comma-separated list of individual dynamic metrics instances to stop retaining.
Examples	Stop retaining individual dynamic metrics. <pre># stop metrics controller.read-ops.A,controller.read-ops.B</pre>
See also	start metrics query metrics show metrics-list

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	standard
Syntax	<pre>suspend replication-set</pre> <pre><replication-set-ID></pre>

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. <pre># suspend replication-set RS1</pre>
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	standard
Syntax	<pre>test</pre> <pre>email managedlogs managedlogswarn managedlogswrap notification snmp syslog</pre> <pre>[region crash1 crash2 crash3 crash4 ecdebug mc scdebug]</pre>
Output	<pre>email managedlogs managedlogswarn managedlogswrap notification snmp syslog</pre> • 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. (Event 312) • snmp: This option behaves the same as the notification option. • syslog: Specify this option to test receipt of notifications by the remote syslog server. <pre>region crash1 crash2 crash3 crash4 ecdebug mc scdebug</pre> 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: <code>crash1</code>, <code>ecdebug</code>, <code>scdebug</code>, and <code>mc</code>.
Examples	Test receipt of event notifications by every interface that is configured to receive them. <pre># test notification</pre>

	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 snmp-parameters set syslog-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 <code>no-access</code>.  CAUTION: When a volume is unmapped from an initiator, the initiator will no longer be able to access the volume's data.
Minimum role	standard
Syntax	<pre>unmap volume initiator <initiators> <hosts> <host-groups> <volumes></pre>
Parameters	<code>initiator</code> <i>initiators hosts host-groups</i> 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. <code>volumes</code> 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 <i>volume-group.*</i>. A name that includes a space must be enclosed in double quotes.
Examples	Delete mappings for Host1 to volumes <code>vol1</code> and <code>vol3</code>. <pre># unmap volume initiator Host1.* vol1,vol3</pre> Delete mappings for volume <code>vol2</code>. <pre># unmap volume vol2</pre>
See also	map volume show initiators show maps show volumes

whoami

Description	Shows domain information for the current user.
Minimum role	monitor
Syntax	<code>whoami</code>
Parameters	User Name The username.

	User Type • Local: The user's credentials reside in the storage system. • LDAP: The user's credentials reside in an Active Directory LDAP server. Group Name Shows the group name for an LDAP user, or N/A for a local user.
Examples	Show domain information for the current user. # whoami
Basetypes	logon-user-detail status

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 [Using XML API output](#).
- References to embedded or nested basetypes that the output may show.

adapt-expand-preview

This basetype is used by [add storage](#) with the `preview` parameter.

Table 6. adapt-expand-preview properties

Name	Type	Description
name	string	The name of an ADAPT disk group.
serial-number	string	The serial number of the ADAPT disk group.
pool	string	The pool for the ADAPT 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 <code>type</code> values. • 4: SAS • 8: SSD SAS • 11: SAS MDL
size	string	The size or capacity formatted with the current session base, precision, and units.
size-numeric	uint64	Unformatted size value in blocks.
raidtype	string	The RAID level of the disk group. • NRAID • RAID0 • RAID1 • RAID5 • RAID6 • RAID10 • ADAPT
raidtype-numeric	string	Numeric equivalents for <code>raidtype</code> values • 0: RAID0 • 1: RAID1

Table 6. adapt-expand-preview properties (continued)

Name	Type	Description
		• 2: ADAPT • 5: RAID5 • 6: NRAID • 10: RAID10 • 11: RAID6
tier	string	• N/A • 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). • 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.
tier-numeric	uint32	Numeric equivalents for 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	List of disks in the disk group, displayed in shorthand notation.
disk-display-full	string	List of disks in the disk group, displayed as <enclosure-id>.<slot-number>.

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 <code>background-scrub-interval</code> parameter. • Disabled: Background disk-group scrub is disabled. • Enabled: Background disk-group scrub is enabled.
background-scrub-numeric	uint32	Numeric equivalents for <code>background-scrub</code> values. • 0: Disabled • 1: Enabled
background-scrub-interval	uint16	Shows the interval between background disk-group scrub finishing and starting again, from 0 to 2160 hours (90 days).
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.

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
partner-firmware-upgrade-numeric	uint32	Numeric equivalents for <code>partner-firmware-upgrade</code> 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 <code>utility-priority</code> 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 <code>smart</code> values. 0: Detect-Only 1: Enabled 2: Disabled
dynamic-spare	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. The dynamic spares feature does not apply to ADAPT disk groups. - 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 <code>MODE SELECT</code> command to change the storage system's write-back cache setting. - Disabled: Hosts can use the SCSI <code>MODE SELECT</code> command to change the write-back cache setting. This is the default. - Enabled: Hosts cannot override the storage system's write-back cache setting.
host-cache-control-numeric	uint32	Numeric equivalents for <code>host-cache-control</code> values. 0: Disabled 1: Enabled
sync-cache-mode	string	Shows how the SCSI <code>SYNCHRONIZE CACHE</code> command is handled. - 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 <code>sync-cache-mode</code> values.

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
		0: Immediate 1: Flush to Disk
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 (default).
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
memory-card-failure	string	Shows whether the cache policy will change from write-back to write-through when memory card is not detected during POST (Power-On Self-Test), fails during POST, or fails during controller operation. - Disabled: The memory-card failure trigger is disabled. - Enabled: The memory-card failure trigger is enabled.
memory-card-failure-numeric	uint32	Numeric equivalents for the memory-card-failure values. 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

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
		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 <code>temperature-exceeded</code> 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 <code>partner-notify</code> 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 <code>auto-write-back</code> 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 <code>disk-dsd-delay</code> 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 <code>disk-dsd-enable</code> values. 0: Disabled 1: Enabled
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 <code>background-disk-scrub</code> 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 <code>managed-logs</code> values.

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
		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	string	Numeric equivalents for <code>single-controller</code> 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. This feature focuses failover/recovery stalls. When a stall is detected, event 531 is logged. - Disabled: Auto stall recovery is disabled. - Enabled: Auto stall recovery is enabled.
auto-stall-recovery-numeric	uint32	Numeric equivalents for <code>auto-stall-recovery</code> values. 0: Disabled 1: Enabled
delete-override	string	Not supported.
delete-override-numeric	uint32	Not supported.
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 <code>restart-on-capi-fail</code> values. 0: Disabled 1: Enabled
large-pools	string	Deprecated.
large-pools-numeric	uint32	Deprecated.
ssd-concurrent-access	string	Not supported.
ssd-concurrent-access-numeric	uint32	Not supported.
slot-affinity	string	Not supported.
slot-affinity-numeric	uint32	Not supported.
random-io-performance-optimization	string	Shows whether random I/O performance optimization is enabled or disabled.
random-io-performance-optimization-numeric	uint32	Numeric equivalents for <code>random-io-performance-optimization</code> values. 0: Disabled 1: Enabled
cache-flush-timeout	string	Shows whether the cache flush timeout is enabled or disabled.

Table 7. advanced-settings-table properties (continued)

Name	Type	Description
cache-flush-timeout-numeric	uint32	Numeric equivalents for <code>cache-flush-timeout</code> values. 0: Disabled 1: Enabled
remanufacture	string	Not supported.
remanufacture-numeric	uint32	Not supported.
hedged-reads-timeout	string	Shows whether the <code>hedged-reads-timeout</code> is enabled or disabled. - Disabled: The <code>hedged-reads-timeout</code> is disabled. - Enabled: The <code>hedged-reads-timeout</code> is enabled.
hedged-reads-timeout-numeric	uint32	Numeric equivalents for <code>hedged-reads-timeout</code> values. 0: Disabled 1: Enabled
auto-map	string	Shows whether the <code>auto map</code> feature is enabled or disabled.
auto-map-numeric	uint32	Numeric equivalents for <code>auto-map</code> values. 0: Disabled 1: Enabled
auto-unmap	string	Shows whether the <code>auto unmap</code> feature is enabled or disabled.
auto-unmap-numeric	uint32	Numeric equivalents for <code>auto-unmap</code> values. 0: Disabled 1: Enabled

alerts

This basetype is used by [show alerts](#).

Table 8. alerts properties

Name	Type	Description
id	uint32	Alert sequence number.
component	string	Component name.
serial-number	string	Component serial number.
description	string	Component description.
durable-id	string	Unique alert ID.
condition-id	string	Unique condition ID.
severity	string	Alert 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.
severity-numeric	uint32	Numeric equivalent for the preceding value. 0: INFORMATIONAL 1: WARNING

Table 8. alerts properties (continued)

Name	Type	Description
		2: ERROR 3: CRITICAL
resolved	string	- No: The alert condition is not resolved. - Yes: The alert condition is resolved.
resolved-numeric	uint32	Numeric equivalent for the preceding value. 0: No 1: Yes
acknowledged	string	- Yes: The alert has been acknowledged. - No: The alert has not been acknowledged.
acknowledged-numeric	uint32	Numeric equivalent for the preceding value. 0: No 1: Yes
acknowledged-by	string	Username that acknowledged the alert.
acknowledged-time	string	Date and time when the alert was acknowledged.
acknowledged-time-numeric	uint32	Unformatted version of the preceding value.
detected-time	string	The most recent date and time when the alert condition was detected.
detected-time-numeric	uint32	Unformatted version of the preceding value.
resolved-time	string	Date and time when the alert condition was resolved. N/A if unresolved.
resolved-time-numeric	uint32	Unformatted version of the preceding value. 0 if unresolved.
reminder-time	string	Not supported.
reminder-time-numeric	uint32	Not supported.
hit-count	uint32	Number of times an alert has occurred without being acknowledged.
basetype	string	Basetype of the component.
health	string	- OK - Fault - N/A
health-numeric	uint32	Numeric equivalent for the preceding value. 0: OK 2: Fault 4: N/A
reason	string	A message describing the alert condition.
reason-numeric	uint32	Numeric equivalent for the preceding value.
reason-id	uint32	Not used.
recommended-action	string	The recommended action to take to resolve the alert condition.
recommended-action-numeric	uint32	Numeric equivalent for the preceding value.

audit-log

This basetype is used by [show audit-log](#).

Table 9. audit-log properties

Name	Type	Description
audit-log	string	Audit log entry, specifying the date, time, user action, and other details.

cache-parameter

This basetype is used by [show cache-parameters](#), when a volume is specified, to show volume cache properties.

Table 10. 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. <code>write-back</code>: 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. <code>write-through</code>: 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. <code>standard</code>: 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. <code>standard-atomic-write</code>: This controller cache mode includes the <code>standard</code> mode features but also guarantees that if a failure (such as I/O being aborted or a controller failure) interrupts a data transfer between a host and the storage system, the controller cache contains either all the old data or all the new data, not a mix of old and new data. This option has a slight performance cost because it maintains a secondary copy of data in cache so that if a data transfer is not completed, the old cache data can be restored. <code>cache-hit-atomic-write</code>: This controller cache mode includes the <code>cache-hit</code> mode features but also guarantees that if a failure (such as I/O being aborted or a controller failure) interrupts a data transfer between a host and the storage system, the controller cache contains either all the old data or all the new data, not a mix of old and new data. This option has a slight performance cost because it maintains a secondary copy of data in cache so that if a data transfer is not completed, the old cache data can be restored.
cache-optimization-numeric	uint32	Numeric equivalents for <code>cache-optimization</code> values. 0: standard 3: standard-atomic-write 5: cache-hit-atomic-write
read-ahead-size	string	The read-ahead cache setting of the volume. <code>Disabled</code>: Read-ahead is disabled. <code>Adaptive</code>: Adaptive read-ahead is enabled, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload.

Table 10. cache-parameter properties (continued)

Name	Type	Description
		• <code>Stripe</code>: 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 <code>read-ahead-size</code> 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 11. cache-settings properties

Name	Type	Description
operation-mode	string	The operating mode of the system, also called the cache redundancy mode. • <code>Active-Active ULP</code>: 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. • <code>Single Controller</code>: The enclosure contains a single controller. • <code>Failed Over</code>: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy. • <code>Down</code>: Both controllers are not operational.
operation-mode-numeric	uint32	Numeric equivalents for <code>operation-mode</code> values. • 2: Active-Active ULP • 3: Single Controller • 4: Failed Over • 5: Down
pi-format	string	Not supported.
pi-format-numeric	uint32	Not supported.
cache-block-size	uint16	512 Bytes
controller-cache-parameters	Embedded, see controller-cache-parameters	

certificate-status

This basetype is used by [show certificate](#).

Table 12. 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	• <code>Customer-supplied</code>: The controller is using a certificate that you have uploaded. • <code>System-generated</code>: The controller is using system-generated certificates. • <code>Unknown status</code>: 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 <code>certificate-status</code> values. • 0: Unknown status • 1: Customer-supplied • 2: System-generated
certificate-time	string	The date and time, in the format <i>year-month-day hour:minutes:seconds</i> , 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.

certificates

This basetype is used by [show certificates](#).

Table 13. certificates properties

Name	Type	Description
certificate-name	string	The name of the certificate, either system-generated or user-supplied when the certificate is uploaded to the system.
certificate-type	string	Shows the certificate type. • <code>Device-Cert</code>: Designation for server or device certificates. • <code>Trust-Cert</code>: Designation for trusted root or intermediate certificates.
certificate-type-numeric	uint32	Numeric equivalent for the <code>certificate-type</code> value. • 0: <code>Device-Cert</code> • 1: <code>Trust-Cert</code>
certificate-controller	string	The controller on which the certificate is installed. • B: Controller B. • A: Controller A.
certificate-controller-numeric	uint32	Numeric equivalent for the <code>certificate-controller</code> value. • 0: B • 1: A
certificate-active-services	string	Displays the service that is actively using the certificate, if any.
certificate-service-web	string	Displays an x if the certificate is currently active for the web service. Otherwise, the value is blank.

Table 13. certificates properties (continued)

Name	Type	Description
certificate-service-wpa	string	Displays an x if the certificate is currently active for the WPA service. Otherwise, the value is blank.
certificate-identity-short	string	Short version of the username registered with a WPA authentication server, or none.
certificate-identity	string	The username registered with a WPA authentication server, in any.
certificate-valid-from	string	The certificate start date.
certificate-valid-till	string	The certificate expiration date.
certificate-issued-to	string	The name or organization the certificate was granted to.
certificate-issued-by	string	The organization or entity that granted the certificate.
certificate-state	string	The current status of the certificate. • Unavailable • Available
certificate-state-numeric	uint32	Numeric equivalent for the certificate-state value. • 0: Unavailable • 1: Available
certificate-status	string	The source of the certificate. • Unknown status: The origin of the certificate cannot be determined. • Customer-supplied: The certificate was uploaded by the end user. • System-generated: The certificate was generated by the system.
certificate-status-numeric	uint32	Numeric equivalent for the certificate-state value. • 0: Unknown status • 1: Customer-supplied • 2: System-generated
certificate-default-services	string	Displays any service associated with the certificate by default, or N/A.
certificate-text	string	Displays the certificate content as text.

ch-contact-info-primary

This basetype is used by [show support-assist-contact](#).

Table 14. ch-contact-info-primary properties

Name	Type	Description
first-name	string	First name entered for the contact.
last-name	string	Last name entered for the contact.
email-address	string	Email address entered for the contact.
phone-number	string	Phone number entered for the contact.
preferred-language	string	Language preference selected for the contact.

ch-contact-info-secondary

This basetype is used by [show support-assist-contact](#).

Table 15. ch-contact-info-secondary properties

Name	Type	Description
first-name	string	First name entered for the contact.
last-name	string	Last name entered for the contact.
email-address	string	Email address entered for the contact.
phone-number	string	Phone number entered for the contact.
preferred-language	string	Language preference selected for the contact.

ch-contact-status

This basetype is used by [show support-assist-contact](#).

Table 16. ch-contact-status properties

Name	Type	Description
contact status	string	The result of the latest attempt to send contact information to the SupportAssist server. • Internal Error • Error • Success • Initiated • Not Attempted
contact status-numeric	uint32	Numeric equivalent for the <code>contact status</code> value. • 0: Internal Error • 1: Error • 2: Success • 3: Initiated • 4: Not Attempted

ch-firmware-updates

This basetype is used by [check support-assist-updates](#).

Table 17. ch-firmware-updates properties

Name	Type	Description
current-revision	string	Revision number of available firmware bundle or disk update.
release-version	string	Release version number of available firmware bundle or disk update.
release-date	string	Release date of available firmware bundle or disk update.
criticality	string	Level of importance for the update.
sha256-checksum	string	SHA-256 checksum for the update.
file-size	uint32	File size for an available update.
file-link	string	File link for an available update.
file-name	string	File name for an available update.
download-url	string	The URL from which to download an available update.
release-notes-link	string	Link to release notes for the update.
description	string	Description of the update, if available.

chap-records

This basetype is used by [show chap-records](#).

Table 18. 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.

ciphers

This basetype is used by [show ciphers](#).

Table 19. ciphers properties

Name	Type	Description
ciphers	string	Active, user-supplied, and default cipher lists.

cli-parameters

This basetype is used by [show cli-parameters](#).

Table 20. 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).
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.

Table 20. cli-parameters properties (continued)

Name	Type	Description
		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 <code>brief-mode</code> values. 0: Disabled 1: Enabled
base	uint8	Alias for <code>storage-size-base</code> .
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 <code>pager</code> values. 0: Disabled 1: Enabled
locale	string	The display language.
locale-numeric	uint32	Numeric equivalents for <code>locale</code> values. 0: English 3: Spanish 4: French 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 <code>storage-size-units</code> is set to TB, <code>storage-size-precision</code> is set to 1, and <code>storage-size-base</code> is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.

Table 20. cli-parameters properties (continued)

Name	Type	Description
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.
usergroupname	string	The logged-in user group name. Shows the real name for an LDAP user or undefined for a local user.

code-load-readiness

This basetype is used by [check firmware-upgrade-health](#) .

Table 21. 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 22. code-load-readiness-reasons properties

Name	Type	Description
readiness-reason	string	The condition that was detected.

Table 22. code-load-readiness-reasons properties (continued)

Name	Type	Description
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 <code>failure-risks</code> values.

communication-ports

This basetype is used by [show protocols](#).

Table 23. communication-ports properties

Name	Type	Description
ssh-port	uint16	The port number used for SSH.
sftp-port	uint16	The port number used for SFTP.

conditions

This basetype is used by [show alert-condition-history](#).

Table 24. conditions properties

Name	Type	Description
id	uint32	Alert condition sequence number.
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.
severity-numeric	unit 32	Numeric equivalent for the <code>severity</code> value. 0: INFORMATIONAL 1: WARNING 2: ERROR 3: CRITICAL
component	string	Component name.
index	uint32	For internal use only.
resolved	string	- No: The alert condition is not resolved. - Yes: The alert condition is resolved.
resolved-numeric	uint32	Numeric equivalent for the preceding value. 0: No 1: Yes
detected-time	string	Date and time when the alert condition was detected.
detected-time-numeric	uint32	Unformatted version of the preceding value.
resolved-time	string	Date and time when the alert was resolved. N/A if unresolved.

Table 24. conditions properties (continued)

Name	Type	Description
resolved-time-numeric	uint32	Unformatted version of the preceding value. 0 if unresolved.
reason	string	A message describing the alert condition.
reason-numeric	uint32	Numeric equivalent for the preceding value.
reason-id	uint32	Not used.

controller-cache-parameters

This basetype is used by `show cache-parameters`.

Table 25. 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 fan 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
memory-card-status	string	- Not Installed: The memory card is not installed. - Installed: The memory card is installed. - Unknown: The memory card's status is unknown.
memory-card-status-numeric	uint32	Numeric equivalent for the memory-card-status value. 0: Not Installed 1: Installed 5: Unknown
memory-card-health	string	- OK - Degraded - Fault - Unknown - N/A

Table 25. controller-cache-parameters properties (continued)

Name	Type	Description
memory-card-health-numeric	uint32	Numeric equivalents for <code>memory-card-health</code> values. 0: OK 1: Degraded 2: Fault 3: Unknown 4: N/A
cache-flush	string	<code>Enabled</code>: 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. <code>Disabled</code>: Cache flush is disabled.
cache-flush-numeric	uint32	Numeric equivalents for <code>cache-flush</code> values. 0: Disabled 1: Enabled

controller-statistics

This basetype is used by `show controller-statistics`.

Table 26. controller-statistics properties

Name	Type	Description
durable-id	string	<code>controller a</code> <code>controller b</code>
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 <code>bytes-per-second</code> 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	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.

Table 26. controller-statistics properties (continued)

Name	Type	Description
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	uint64	Unformatted <code>data-read</code> 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 <code>data-written</code> 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 <i>year-month-day hour:minutes:seconds</i> , when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	uint32	Unformatted <code>reset-time</code> value.
start-sample-time	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> , when sampling started for the <code>iops</code> and <code>bytes-per-second</code> values.
start-sample-time-numeric	uint32	Unformatted <code>start-sample-time</code> value.
stop-sample-time	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> , when sampling stopped for the <code>iops</code> and <code>bytes-per-second</code> values.
stop-sample-time-numeric	uint32	Unformatted <code>stop-sample-time</code> value.
total-power-on-hours	string	The total amount of hours the controller has been powered on in its life time.

controllers

This basetype is used by [show configuration](#) and [show controllers](#).

Table 27. 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	Numeric equivalent for the <code>controller-id</code> value. 0: B 1: A
url	string	For internal use only.
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.

Table 27. controllers properties (continued)

Name	Type	Description
ip-gateway	string	Controller network port gateway IPv4 address.
ip6-link-local-address	string	The link-local IPv6 address.
ip6-link-local-gateway	string	The network port gateway IPv6 address.
autoconfig	string	- 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.
autoconfig-numeric	uint32	Numeric equivalent for the autoconfig value. 0: Disabled 1: Enabled
ip6-auto-address	string	The automatically configured IPv6 address of the controller, when applicable.
dhcpv6	string	The IP address assigned by a DHCPv6 server.
slaac-ip	string	The IP address computed by SLAAC
ip6-auto-address-source	string	The method used to assign or compute the address, when applicable. - DHCPv6 - IPv6 SLAAC
ip6-auto-address-source-numeric	uint32	Numeric equivalent for the ip6-auto-address-source value. 0: DHCPv6 1: IPv6 SLAAC
ip6-auto-gateway	string	The IPv6 address of a gateway system (auto-discovered, not configured).
ip61-address	string	From one to four pairs of manually set IPv6 addresses and network-port gateway IPv6 addresses.
ip61-gateway	string	
ip62-address	string	
ip62-gateway	string	
ip63-address	string	
ip63-gateway	string	
ip64-address	string	
ip64-gateway	string	
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.
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

Table 27. controllers properties (continued)

Name	Type	Description
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 <code>status</code> property becomes <code>Down</code> for one controller and the time that the value of the <code>failed-over</code> property becomes <code>Yes</code> 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 <code>failed-over</code> values. 0: No 1: Yes
fail-over-reason	string	If <code>failed-over</code> is <code>Yes</code> , a reason for the failover appears; otherwise, <code>Not applicable</code> appears.
fail-over-reason-numeric	uint32	Numeric equivalents for <code>fail-over-reason</code> 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 <code>platform-type</code> 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 <code>multicore</code> values. 0: Enabled 1: Disabled
sc-cpu-type	string	Storage Controller processor type.
sc-cpu-speed	uint32	Storage Controller processor speed.
internal-serial-number	string	Internal serial number of the controller.
cache-lock	string	Shows whether hosts are prevented from using the <code>SCSI MODE SELECT</code> 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 <code>cache-lock</code> 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

Table 27. controllers properties (continued)

Name	Type	Description
		(such as a fan 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. • <code>write-back</code>: This is the normal state. • <code>write-through</code> • <code>Not up</code>: The controller is not up.
<code>write-policy-numeric</code>	<code>uint32</code>	Numeric equivalents for <code>write-policy</code> values. • 0: <code>write-back</code> • 1: <code>write-through</code> • 2: <code>Not up</code>
<code>description</code>	<code>string</code>	FRU long description.
<code>part-number</code>	<code>string</code>	Part number for the FRU.
<code>revision</code>	<code>string</code>	Hardware revision level for the FRU.
<code>dash-level</code>	<code>string</code>	FRU template revision number.
<code>fru-shortname</code>	<code>string</code>	FRU short description.
<code>mfg-date</code>	<code>string</code>	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> (UTC), when the PCBA of the controller was programmed.
<code>mfg-date-numeric</code>	<code>uint32</code>	Unformatted <code>mfg-date</code> value.
<code>mfg-location</code>	<code>string</code>	City, state/province, and country where the FRU was manufactured.
<code>mfg-vendor-id</code>	<code>string</code>	JEDEC ID of the FRU manufacturer.
<code>locator-led</code>	<code>string</code>	Shows the state of the locator LED on a controller module. • <code>Off</code> • <code>On</code>
<code>locator-led-numeric</code>	<code>uint32</code>	Numeric equivalents for <code>locator-led</code> values. • 0: <code>Off</code> • 1: <code>On</code>
<code>ssd-alt-path-io-count</code>	<code>uint8</code>	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.
<code>health</code>	<code>string</code>	• <code>OK</code> • <code>Degraded</code> • <code>Fault</code> • <code>Unknown</code> • <code>N/A</code>
<code>health-numeric</code>	<code>uint32</code>	Numeric equivalents for health values. • 0 : <code>OK</code> • 1: <code>Degraded</code> • 2: <code>Fault</code> • 3: <code>Unknown</code> • 4: <code>N/A</code>
<code>health-reason</code>	<code>string</code>	If Health is not <code>OK</code> , the reason for the health state.
<code>health-recommendation</code>	<code>string</code>	If Health is not <code>OK</code> , the recommended actions to take to resolve the health issue.
<code>position</code>	<code>string</code>	Position of the controller module, as viewed from the back of the enclosure. • <code>Left</code>

Table 27. controllers properties (continued)

Name	Type	Description
		• 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. • Deleted point 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. • 8: Active-Active ULP • 9: Single Controller • 10: Failed Over • 11: 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. • 0: Operational but not redundant • 2 : Redundant

Table 27. controllers properties (continued)

Name	Type	Description
		4: Down 5: Unknown
conditions	Embedded;	see health-conditions .
unhealthy-component	Embedded;	see unhealthy-component .
ip-address	Embedded;	see network-parameters .
port-details	Embedded;	see port .
enclosure-id	Embedded;	see expander-ports .
expander-details	Embedded;	see expanders .

copy-volumes

This basetype is used by [show volume-copies](#).

Table 28. 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: <code>Virtual</code> or <code>Linear</code> .
source-type-numeric	uint32	Numeric equivalents for source-type values. 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 tasks](#) for a `Replicate` task.

Table 29. 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	<code>False</code>: The primary volume will be replicated. <code>True</code>: The most recent snapshot of the primary volume will be replicated.

Table 29. cs-replicate-tasks properties (continued)

Name	Type	Description
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 30. cs-replication 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.
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	For the last run, the date and time when the replication ended.
time-end-numeric	uint32	Unformatted time-end value.
estimated-time- completion	string	For the current run, 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 31. 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.
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: 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.

Table 31. cs-replication-set-properties (continued)

Name	Type	Description
		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. <code>never-delete</code>: Snapshots will never be deleted automatically to make space. The oldest snapshot in the snapshot history will be deleted once the <code>snapshot-count</code> value has been exceeded. <code>high</code>: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted. <code>medium</code>: Snapshots can be deleted after all eligible low-priority snapshots have been deleted. <code>low</code>: Snapshots can be deleted.
retention-priority-numeric	uint32	Numeric equivalents for <code>retention-priority-numeric</code> values. 0: <code>never-delete</code> 1: <code>low</code> 2: <code>medium</code> 3: <code>high</code>
status	string	<code>Not Ready</code>: The replication set is not ready for replications because the system is still preparing the replication set. <code>Unsynchronized</code>: The primary and secondary volumes are unsynchronized because the system has prepared the replication set, but the initial replication has not run. <code>Running</code>: A replication is in progress. <code>Ready</code>: The replication set is ready for a replication. <code>Suspended</code>: Replications have been suspended. <code>Failed Over</code>: The replication set's secondary system has allowed direct access to the secondary volume or volume group because the primary system is not operational. In this state no replications will occur, even if the primary system becomes operational and communication is restored. <code>Unknown</code>: 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 <code>status</code> values.
failback-in-progress	string	<code>True</code>: A <code>failback-restore</code> process for this replication set has started and is in progress. <code>False</code>: The <code>failback-restore</code> process is complete on both systems.
failback-in-progress-numeric	uint32	Numeric equivalent for the <code>failback-in-progress</code> value. 0: <code>False</code> 1: <code>True</code>
failback-sync- complete	string	<code>False</code>: Synchronization is not complete after replication-set failback. <code>True</code>: Synchronization is complete after replication-set failback.

Table 31. cs-replication-set-properties (continued)

Name	Type	Description
failback-sync-complete-numeric	uint32	Numeric equivalent for the <code>failback-sync-complete</code> value. 0: False 1: True
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 <code>last-success-time</code> 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 <code>estimated-time-completion</code> 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 32. 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.
creation-date-time-numeric	uint32	Unformatted <code>creation-date-time</code> value.
snap-data	blocks	The total amount of write data associated with the snapshot.
snap-data-numeric	uint64	Unformatted <code>snap-data</code> value.
unique-data	blocks	The amount of write data that is unique to the snapshot.
uniquedata-numeric	uint64	Unformatted <code>uniquedata</code> value.
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 33. disk-groups properties

Name	Type	Description
name	string	The name of the disk group.
url	string	For internal use only.
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 <code>size</code> 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 <code>freespace</code> 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 <code>raw-size</code> value in blocks.
storage-type	string	• <code>Linear</code>: The disk group acts as a linear pool. • <code>Virtual</code>: The disk group is in a virtual pool.
storage-type-numeric	uint32	Numeric equivalents for <code>storage-type</code> values. • 0: Linear • 1: Virtual
pool	string	The name of the pool that contains the disk group.
pools-url	string	For internal use only.
pool-serial-number	string	The serial number of the pool that contains the disk group.
storage-tier	string	• <code>Archive</code>: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • <code>Performance</code>: The disk group is in the highest storage tier, which uses SSDs (high speed). • <code>Read Cache</code>: The disk is an SSD providing high-speed read cache for a storage pool. • <code>Standard</code>: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM).
storage-tier-numeric	uint32	Numeric equivalents for <code>storage-tier</code> 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.

Table 33. disk-groups properties (continued)

Name	Type	Description
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 • RAID1 • RAID5 • RAID6 • RAID10 • ADAPT
raidtype-numeric	uint32	Numeric equivalents for raidtype values. • 0: RAID0 • 1: RAID1 • 2: ADAPT • 5: RAID5 • 6: NRAID • 10: RAID10 • 11: RAID6
diskcount	uint16	Number of disks in the disk group.
spear	string	Not supported.
spear-numeric	uint32	Not supported.
trusted-reads	string	Not supported.
trusted-reads-numeric	uint32	Not supported.
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, the chunk size for the disk group. • For NRAID and RAID 1, not applicable (N/A).
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.

Table 33. disk-groups properties (continued)

Name	Type	Description
		• FTOL: Fault tolerant. • 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 <code>status</code> 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.
min-drive-size-numeric	uint64	Numeric equivalents for <code>min-drive-size</code> values.
create-date	string	Date and time, in the format <code>year-month-day hour:minutes:seconds</code> (UTC), when the disk group was created.
create-date-numeric	uint32	Unformatted <code>create-date</code> 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.

Table 33. disk-groups properties (continued)

Name	Type	Description
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. • PRERCON: At least one disk in the disk group is being preemptively reconstructed. • RBAL: The ADAPT disk group is being rebalanced. • RCON: At least one disk in the disk group is being reconstructed. • REFT: The ADAPT disk group's fault-tolerant stripes are being rebalanced. • 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 • 15: PRERCON • 16: RBAL • 17: REFT
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.
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 <code>largest-free-partition-space</code> value in blocks.
num-drives-per-low-level-array	uint8	• For a RAID-10 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.

Table 33. disk-groups properties (continued)

Name	Type	Description
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 <code>new-partition-lba</code> value in blocks.
array-drive-type	string	Deprecated. See <code>disk-description</code> .
array-drive-type-numeric	uint32	Deprecated. See <code>disk-description-numeric</code> .
disk-description	string	Disk description. <code>SAS</code>: Enterprise SAS spinning disk. <code>SAS MDL</code>: Midline SAS spinning disk. <code>SSD SAS</code>: SAS solid-state disk.
disk-description-numeric	uint32	Numeric equivalents for description values. <code>4</code>: SAS <code>8</code>: SSD SAS <code>11</code>: SAS MDL
is-job-auto-abortable	string	<code>false</code>: The current job must be manually aborted before you can delete the disk group. <code>true</code>: The current job will automatically abort if you delete the disk group.
is-job-auto-abortable-numeric	uint32	Numeric equivalents for <code>is-job-auto-abortable</code> values. <code>0</code>: false <code>1</code>: true
serial-number	string	Disk group serial number.
blocks	uint64	The number of blocks, whose size is specified by the <code>blocksize</code> property.
disk-dsd-enable-vdisk	uint64	<code>Disabled</code>: DSD is disabled for the disk group <code>Enabled - all spinning</code>: DSD is enabled for the disk group. <code>Partial spin-down</code>: DSD is enabled for the disk group and its disks are partially spun down to conserve power. <code>Full spin-down</code>: 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 <code>disk-dsd-enable-vdisk</code> values. <code>0</code>: Disabled <code>1</code>: Enabled - all spinning <code>2</code>: Partial spin-down <code>3</code>: Full spin-down
disk-dsd-delay-vdisk	uint32	For spinning disks , 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.
scrub-duration-goal	uint16	The desired duration of a disk group scrub operation, in hours. A value of 0 indicates that the scrub duration will use the system default duration setting of 720 hours (30 days).
pool-sector-format	string	The sector format of disks in the disk group. <code>512n</code>: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes. <code>512e</code>: 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.

Table 33. disk-groups properties (continued)

Name	Type	Description
		• 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 <code>pool-sector-format</code> values. • 0: 512n • 1: 512e • 3: Mixed
stripe-width	string	Shown by the <code>detail</code> parameter. For an ADAPT disk group, this specifies the stripe width to use. • 8+2: Each stripe contains 8 data chunks and 2 parity chunks. Including spare capacity equivalent to the 2 largest disks, the minimum disk group size is 12 disks. This is the default. • 16+2: Each stripe contains 16 data chunks and 2 parity chunks. Including spare capacity equivalent to the 2 largest disks, the minimum disk group size is 20 disks. This option has less overhead, but also less redundancy, than the 8+2 option. • blank: Undefined. The disk group is not configured for ADAPT.
stripe-width-numeric	uint32	Numeric equivalent for the <code>stripe-width</code> value. • 0: Undefined • 1: 8+2 • 2: 16+2
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.
target-spare-capacity-numeric	uint64	uint64 Unformatted <code>target-spare-capacity</code> value in blocks.
actual-spare-capacity	string	For an ADAPT disk group, the currently available spare capacity in GiB.
actual-spare-capacity-numeric	uint64	Unformatted <code>actual-spare-capacity</code> value in blocks.
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.)
critical-capacity-numeric	uint64	Unformatted <code>critical-capacity</code> value in blocks.
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.)
degraded-capacity-numeric	uint64	Unformatted <code>degraded-capacity</code> value in blocks.
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.
metadata-size	string	The amount of metadata the disk group is currently using.
metadata-size-numeric	uint64	Unformatted <code>metadata-size</code> value.
extended-status	uint64	A bitmap that represents all alert conditions active on the component. If no conditions are active, 0.
health	string	• OK • Degraded • Fault • Unknown • N/A
health-numeric	uint32	Numeric equivalents for <code>health</code> values.

Table 33. disk-groups properties (continued)

Name	Type	Description
		• 0: OK • 1: Degraded • 2: Fault • 3: Unknown • 4 : N/A
health-reason	string	A message describing the alert condition.
health-reason-numeric	uint32	Numeric equivalent for the preceding value.
health-recommendation	string	The recommended action to take to resolve the alert condition.
health-recommendation-numeric	uint32	Numeric equivalent for the preceding value.
conditions	Embedded; see health-conditions	
unhealthy-component	Embedded; see unhealthy-component .	

disk-groups-preview

This basetype is used by [add storage](#) when the `preview` parameter is specified.

Table 34. 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 the type values. • 4: SAS • 8: SSD SAS • 11: SAS MDL
size	string	The size or capacity formatted with the current session base, precision, and units.
size-numeric	uint32	Unformatted size value.
raidtype	string	The RAID level of the disk group. • NRAID • RAID0 • RAID1 • RAID5 • RAID6 • RAID10 • ADAPT
raidtype-numeric	uint32	Numeric equivalents for <code>raidtype</code> values. • 0 : RAID0 • 1 : RAID1 • 2 : ADAPT • 5 : RAID5

Table 34. disk-groups-preview properties (continued)

Name	Type	Description
		6: NRAID 10: RAID10 11: RAID6
tier	string	- N/A - 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). - 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.
tier-numeric	uint32	Numeric equivalents for 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	List of disks in the disk group, displayed in shorthand notation.
disk-display-full	string	List of disks in the disk group, displayed as <enclosure-id>.<slot-number>.

disk-group-statistics

This basetype is used by `show disk-group-statistics`.

Table 35. 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 <code>data-read</code> 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 <code>data-written</code> value.

Table 35. disk-group-statistics properties (continued)

Name	Type	Description
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 <code>bytes-per-second</code> value.
ios	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`.

Table 36. 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 <code>UNMAP</code> 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 37. 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 <code>total-data-transferred</code> value.

Table 37. disk-hist-statistics properties (continued)

Name	Type	Description
data-read	string	Amount of data read since the last sampling time.
data-read-numeric	uint64	Unformatted <code>data-read</code> value.
data-written	string	Amount of data written since the last sampling time.
data-written-numeric	uint64	Unformatted <code>data-written</code> 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 <code>total-bytes-per-second</code> 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 <code>read-bytes-per-second</code> 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 <code>write-bytes-per-second</code> 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 <code>avg-io-size</code> value.
avg-read-io-size	string	Average data size of read operations since the last sampling time.
avg-read-io-size-numeric	uint64	Unformatted <code>avg-read-io-size</code> value.
avg-write-io-size	string	Average data size of write operations since the last sampling time.
avg-write-io-size-numeric	uint64	Unformatted <code>avg-write-io-size</code> 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 <i>year-month-day hour:minutes:seconds</i> , when the data sample was taken.
sample-time-numeric	uint32	Unformatted <code>sample-time</code> value.

disk-statistics

This basetype is used by `show disk-statistics` when the `historical` parameter is omitted.

Table 38. disk-statistics properties

Name	Type	Description
durable-id	string	Disk ID in the format <code>disk_enclosure-number.disk-number</code> .
location	string	The disk location in the format <code>enclosure-number.disk-number</code> .
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 <code>bytes-per-second</code> 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 <code>data-read</code> 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 <code>data-written</code> 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 <code>lifetime-data-read</code> value.
lifetime-data-written	string	The amount of data written to the disk in its lifetime.
lifetime-data-written-numeric	uint64	Unformatted <code>lifetime-data-written</code> value.
reset-time	string	Date and time, in the format <code>year-month-day hour:minutes:seconds</code> , when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	uint32	Unformatted <code>reset-time</code> value.
start-sample-time	string	Date and time, in the format <code>year-month-day hour:minutes:seconds</code> , when sampling started for the iops and bytes-per-second values.
start-sample-time-numeric	uint32	Unformatted <code>start-sample-time</code> value.
stop-sample-time	string	Date and time, in the format <code>year-month-day hour:minutes:seconds</code> , when sampling stopped for the iops and bytes-per-second values.
stop-sample-time-numeric	uint32	Unformatted <code>stop-sample-time</code> value.
smart-count-1	uint32	For port 1, the number of SMART events recorded.
smart-count-2	uint32	For port 2, the number of SMART events recorded.

Table 38. disk-statistics properties (continued)

Name	Type	Description
io-timeout-count-1	string	For port 1, the number of timeouts accessing the disk.
io-timeout-count-2	uint32	For port 2, the number of timeouts accessing the disk.
no-response-count-1	uint32	For port 1, the number of times the disk did not respond.
no-response-count-2	uint32	For port 2, 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.
spinup-retry-count-2	uint32	For port 2, 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.
number-of-media-errors-2	uint32	For port 2, the number of media errors generated by the disk, as specified by its manufacturer.
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-nonmedia-errors-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-block-reassigns-1	uint32	For port 1, the number of times blocks were reassigned to alternate locations.
number-of-block-reassigns-2	uint32	For port 2, 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.
number-of-bad-blocks-2	uint32	For port 2, the number of bad blocks encountered.

disk-update

This basetype is used by `show disks` with the `updates` parameter.

Table 39. disk-update properties

Name	Type	Description
location	string	Disk's enclosure ID and slot number.
vendor	string	Disk vendor.
model	string	Disk model.
current-revision	string	Currently installed firmware revision.
new-revision	string	New firmware revision.
build-date	string	Date and time when the firmware was built.
sha256-checksum	string	SHA-256 checksum.
upgrade-requirement	string	- Recommended - Critical - Required - Unknown
upgrade-requirement-numeric	uint32	0: Recommended 1: Critical 2: Required - Other: Unknown
site-link	string	URL of the website from which the firmware can be installed.

Table 39. disk-update properties (continued)

Name	Type	Description
file-link	string	URL of the firmware file.
description	string	Description of the firmware file.

dns-parameters

This basetype is used by `show dns-parameters`.

Table 40. dns-parameters properties

Name	Type	Description
controller	string	- A: Controller A. - B: Controller B.
controller-numeric	uint32	0: B 1: A
name-servers	string	Configured name server IP address values.
search-domains	string	Configured domain name values.

drive-parameters

This basetype is used by `show disk-parameters`.

Table 41. 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 <code>smart</code> values. 0: Detect-Only 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 <code>drive-write-back-cache</code> 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 <code>drive-attempt-timeout</code> and <code>drive-timeout-retry-max</code> settings. This value cannot be changed.

Table 41. drive-parameters properties (continued)

Name	Type	Description
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 <code>disk-dsd-delay</code> 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 <code>disk-dsd-enable</code> 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.
remanufacture	string	Not supported.
remanufacture-numeric	uint32	Not supported.

drive-summary

This basetype is used by `show disk-statistics` when the `historical` parameter is specified.

Table 42. drive-summary properties

Name	Type	Description
durable-id	string	Disk ID in the format <code>disk_enclosure-number.disk-number</code> .
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 43. drives properties

Name	Type	Description
durable-id	string	Disk ID in the format <code>disk_enclosure-ID.slot-number</code> .
enclosure-id	uint32	Enclosure ID.
drawer-id	uint8	For a 2U12 or 2U24 enclosure: Not applicable. For a 5U84 enclosure: 0: Top 1: Bottom
slot	uint32	Disk slot number.
location	string	Enclosure ID of the disk and slot number.
url	string	For internal use only.
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 <code>blocksize</code> property.

Table 43. drives properties (continued)

Name	Type	Description
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.
single-ported-numeric	uint32	Numeric equivalents for single-ported values. • 0: Disabled • 1: Enabled
type	string	Deprecated. See description, architecture, interface, and single-ported.
type-numeric	uint32	Deprecated. See description-numeric, architecture-numeric, interface-numeric, and single-ported-numeric.
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. Possible reasons include:

Table 43. drives properties (continued)

Name	Type	Description
		○ 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. ○ The disk is from an unsupported vendor. ● UNUSABLE: The disk cannot be used in a disk group because the disk is from an unsupported vendor. ● 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: LINEAR POOL ● 2: DEDICATED SP ● 3: GLOBAL SP ● 5: LEFTOVR ● 7: FAILED ● 8: UNUSABLE ● 9: VIRTUAL POOL
job-running	string	Job running on the disk, if any. ● (blank): No job running. ● DRSC: The disk is being scrubbed. ● EXPD: The disk group is being expanded. ● INIT: The disk group is being initialized. ● PRERCON: The disk is being used in a preemptive reconstruct operation. ● RBAL: The ADAPT disk group is being rebalanced. ● REFT: The ADAPT disk group's fault-tolerant stripes are being rebalanced. ● 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.
job-running-numeric	uint32	Numeric equivalent for the job-running value. ● 0: None ● 2: INIT ● 3: RCON ● 4: VRFY ● 5: EXPD ● 6: VRSC ● 7: DRSC ● 9: VREMV ● 12: VPREP ● 13: VDRAIN ● 14: VRECV ● 15: PRERCON ● 16: RBAL ● 17: REFT
state	string	Deprecated. See usage and job-running.

Table 43. drives properties (continued)

Name	Type	Description
current-job-completion	string	0%–99%: Percent complete of running job. (blank): No job is running (job has completed).
remanufacture	string	Not supported.
remanufacture-numeric	string	Not supported.
supports-unmap	string	- Yes: The disk supports the SCSI UNMAP command. - No: The disk does not support the SCSI UNMAP command.
supports-unmap-numeric	uint32	Numeric equivalent for the <code>supports-unmap</code> value. 0: No 1: Yes
blink	uint32	Deprecated. For locator LED status, see <code>locator-led</code> .
locator-led	string	Shows the state of the locator LED on a disk. - Off - on
locator-led-numeric	uint32	Numeric equivalent for the <code>locator-led</code> value. 0: Off 1: On
speed	uint32	Not used.
smart	string	- Disabled: SMART is disabled for this disk. - Enabled: SMART is enabled for this disk.
smart-numeric	uint32	Numeric equivalents for <code>smart</code> values. 0: Disabled 1: Enabled
dual-port	uint32	0: Single-ported disk. 1: Dual-ported disk.
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 WWPNN.
fc-p1-unit-number	uint32	Port 1 unit number.
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 WWPNN.
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.

Table 43. drives properties (continued)

Name	Type	Description
		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 <code>size</code> 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 <code>sector-format</code> 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 12.0 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 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.
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.
attributes-numeric	uint32	For internal use only.
enclosure-wwn	string	Enclosure WWN.
enclosures-url	string	For internal use only.
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.

Table 43. drives properties (continued)

Name	Type	Description
		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
copyback-state	string	Not supported.
copyback-state-numeric	uint32	Not supported.
virtual-disk-serial	string	If the disk is in a linear disk group, the disk group name. Otherwise, blank.
disk-group	string	If the disk is in a disk group, the disk group name. Otherwise, blank.
storage-pool-name	string	If the disk is in a pool, the pool name. Otherwise, blank.
storage-tier	string	- Archive: The disk is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). - N/A: Not applicable. - Performance: The disk 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 is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM).
storage-tier-numeric	uint32	Numeric equivalent for the storage-tier value. 0: N/A 1: Performance 2: Standard 4: Archive 8: Read Cache
ssd-life-left	string	100%-0%: For an SSD, this value 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.
ssd-life-left-numeric	uint32	Numeric equivalent for the ssd-life-left value. 0-100 255: N/A
led-status	string	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. - Blank if the disk is not part of a disk group or is spun down.
led-status-numeric	uint32	Numeric equivalent for the led-status value. 2: Rebuild 4: Fault

Table 43. drives properties (continued)

Name	Type	Description
		16: ID
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 <code>total-data-transferred</code> 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 <code>fde-state</code> values. 0: UNKNOWN 1: Not FDE Capable 2: Not Secured 3: Secured, Unlocked 4: Secured, Locked 5: FDE Protocol Failure
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 <code>year-month-day hour:minutes:seconds</code> (UTC). Otherwise, N/A.
fde-config-time-numeric	uint32	Unformatted <code>fde-config-time</code> value.
temperature	string	Temperature of the disk.
temperature-numeric	uint32	Numeric equivalent for the <code>temperature</code> 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 <code>temperature-status</code> values. 1: OK 2: Critical 3: Warning - other: Unknown
pi-formatted	string	Not supported.

Table 43. drives properties (continued)

Name	Type	Description
pi-formatted-numeric	unit32	Not supported.
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 bitmap that represents all alert conditions active on the component. If no conditions are active, 0 • 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 • 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

Table 43. drives properties (continued)

Name	Type	Description
health-reason	string	If Health is not OK, the reason for the health state.
health-reason-numeric	uint32	Numeric equivalent for the health-reason value.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.
health-recommendation-numeric	uint32	Numeric equivalent for the health-recommendation value.
conditions	Embedded; see health-conditions .	

email-parameters

This basetype is used by [show email-parameters](#).

Table 44. 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 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

Table 44. email-parameters properties (continued)

Name	Type	Description
		• 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.
alert-notification	string	• all: Sends notifications for all alerts. • none: Email notification for alerts is disabled.
alert-notification-numeric	uint32	Numeric equivalent for the alert-notification-numeric value. • 5: none • 6: all
event-notification	string	The minimum severity for which the system should send event 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.
event-notification-numeric	uint32	Numeric equivalent for the event-notification-filter value. • 0: info • 1: resolved • 2: warn • 3: error • 4: crit • 5: none
persistent-alerts	string	Not applicable.
persistent-alerts-numeric	uint32	Not applicable.
email-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.
email-include-logs-numeric	uint32	Numeric equivalents for email-include-logs values. • 0: Disabled • 1: Enabled

enclosure-fru

This basetype is used by [show configuration](#) and [show frus](#).

Table 45. 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
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 <i>year-month-day hour:minutes:seconds</i> (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. - LEFT_PSU_SLOT: Power supply module on the left, as viewed from the back. - RIGHT_PSU_SLOT: Power supply module on the right, as viewed from the back. - CONTROLLER_A: Controller module A. - CONTROLLER_B: Controller module B.
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
original-serialnumber	string	For a power supply module, the original manufacturer serial number. Otherwise, N/A.

Table 45. enclosure-fru properties (continued)

Name	Type	Description
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 `enc1` parameter is specified.

Table 46. enclosure-list properties

Name	Type	Description
status	string	Disk slot status. • <code>Up</code>: The disk is present and is properly communicating with the expander. • <code>Spun Down</code>: The disk is present and has been spun down by the drive spin down feature. • <code>Warning</code>: 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. • <code>Error</code>: The disk is present but is not detected by the expander. • <code>Unknown</code>: Initial status when the disk is first detected or powered on. • <code>Not Present</code>: The disk slot indicates that no disk is present. • <code>Unrecoverable</code>: The disk is present but has unrecoverable errors. • <code>Unavailable</code>: The disk is present but cannot communicate with the expander. • <code>Unsupported</code>: The disk is present but is an unsupported type.
status-numeric	uint32	Numeric equivalents for <code>status</code> 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 <code>size</code> value in blocks.

enclosures

This basetype is used by [show configuration](#) and [show enclosures](#).

Table 47. enclosure properties

Name	Type	Description
durable-id	string	Enclosure ID in the format <code>enclosure_number</code> .
enclosure-id	uint8	Enclosure ID.
url	string	For internal use only.
enclosure-wwn	string	Enclosure WWN.
name	string	Enclosure name.
type	string	Internal name for the enclosure type.
type-numeric	uint32	Numeric equivalents for <code>type</code> values.
iom-type	string	I/O module type.
iom-type-numeric	uint32	Numeric equivalents for <code>iom-type</code> values.
platform-type	string	Hardware <code>platform</code> type.
platform-type-numeric	uint32	Numeric equivalents for <code>platform-type</code> values.
board-model	string	Board model.
board-model-numeric	uint32	Numeric equivalents for <code>board-model</code> 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. • <code>Unsupported</code> • <code>OK</code> • <code>Critical</code> • <code>Warning</code> • <code>Unrecoverable</code> • <code>Not Installed</code> • <code>Unknown</code> • <code>Unavailable</code>
status-numeric	uint32	Numeric equivalents for <code>status</code> values. • 0: <code>Unsupported</code> • 1: <code>OK</code> • 2: <code>Critical</code> • 3: <code>Warning</code> • 4: <code>Unrecoverable</code> • 5: <code>Not Installed</code> • 6: <code>Unknown</code> • 7: <code>Unavailable</code>
extended-status	hex32	A bitmap that represents all alert conditions active on the component. If no conditions are active, 0.

Table 47. enclosure properties (continued)

Name	Type	Description
midplane-serial-number	string	Midplane serial number.
vendor	string	Enclosure vendor.
model	string	Enclosure model.
fru-tlapn	string	FRU top-level assembly part number.
fru-shortname	string	FRU short description.
fru-location	string	FRU location. <code>MID-PLANE_SLOT</code>: Chassis midplane.
part-number	string	FRU part number.
mfg-date	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> (UTC), when a PCBA was programmed or a power supply module was manufactured.
mfg-date-numeric	uint32	Unformatted <code>mfg-date</code> 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	Not supported.
emp-b-rev	string	Not supported.
gem-version-a	string	GEM firmware component version in controller module A.
gem-version-b	string	GEM firmware component version in controller module B.
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. <code>Off</code> <code>On</code>
locator-led-numeric	uint32	Numeric equivalents for <code>locator-led</code> values. <code>0</code>: Off <code>1</code>: On
drive-orientation	string	<code>vertical</code>: Disks are oriented vertically. <code>horizontal</code>: Disks are oriented horizontally.
drive-orientation-numeric	uint32	Numeric equivalents for <code>drive-orientation</code> values. <code>0</code>: vertical <code>1</code>: horizontal
enclosure-arrangement	string	<code>vertical</code>: Disks are numbered vertically (by column from top to bottom, proceeding from left to right). <code>horizontal</code>: Disks are numbered horizontally (by row from left to right, proceeding from top to bottom).
enclosure-arrangement-numeric	uint32	Numeric equivalents for <code>enclosure-arrangement</code> values. <code>0</code>: vertical <code>1</code>: horizontal

Table 47. enclosure properties (continued)

Name	Type	Description
emp-a-busid	string	Not supported.
emp-a-targetid	string	Not supported.
emp-b-busid	string	Not supported.
emp-b-targetid	string	Not supported.
emp-a	string	Not supported.
emp-a-ch-id-rev	string	Not supported.
emp-b	string	Not supported.
emp-b-ch-id-rev	string	Not supported.
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 <code>midplane-type</code> 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 <code>pcie2-capable</code> values. 0: False 1: True
health	string	- OK - Degraded - Fault - Unknown - N/A
health-numeric	uint32	Numeric equivalents for <code>health</code> 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.
conditions	Embedded; see health-conditions .	
unhealthy-component	Embedded; see unhealthy-component .	
drawer	Embedded; see drawer-sensors .	
controllers	Embedded; see controllers , io-modules .	
power-supplies	Embedded; see power-supplies .	
fan-modules	Embedded; see fan-modules .	
fan-details	Embedded; see fan .	

endpoints-status

This basetype is used by [check support-assist-connection](#).

Table 48. endpoints-status properties

Name	Type	Description
mode	string	The connection method specified for the connectivity test, <code>director</code> or <code>gateway</code> .
endpoint	string	The URL for which the connection is verified.
status	string	Connectivity test result for the endpoint, <code>success</code> , <code>fail</code> , or <code>disabled</code> .
http-status	uint16	The HTTP response code (e.g., 200 for success, 400 for failure).
message	string	The message that corresponds with <code>http-status</code> (e.g., OK for 200).
status-detail	string	Provides additional information about the status. The following values are possible: • Success • Disabled • Failed • TimedOut • ConnectionError • SSLError • ProxyError
proxy-type	string	Indicates the authentication with proxy. The following values are possible: • <code>httpAnonymous</code>: Proxy is used but proxy username is null or empty. • <code>httpUsernameOnly</code>: Proxy is used, proxy username is set, but proxy password is null or empty. • <code>httpUsernamePassword</code>: Proxy is used, and the proxy username and password are set. • <code>invalidProxyConfig</code>: Proxy is used, but the proxy URI is invalid, null, or empty. • <code>none</code>: Proxy is not used.

events

This basetype is used by [show events](#).

Table 49. events properties

Name	Type	Description
time-stamp	string	Date and time, in the format <code>year-month-day hour:minutes:seconds</code> (UTC), when this event was detected.
time-stamp-numeric	uint32	Unformatted time-stamp value.
event-code	string	Event code.
event-id	string	Event ID.
url	string	For internal use only.
model	string	Controller model.
serial-number	string	Controller serial number.
controller	string	• A: Controller A. • B: Controller B.

Table 49. events properties (continued)

Name	Type	Description
controller-numeric	uint32	Numeric equivalents for <code>controller</code> 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 <code>severity</code> 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 50. 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 <i>year-month-day hour:minutes:seconds</i> (UTC), when this event was detected.
time-stamp-numeric	string	Unformatted <code>time-stamp</code> 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. 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 <code>severity</code> values. 0: INFORMATIONAL

Table 50. eventsLogs properties (continued)

Name	Type	Description
		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 51. 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-id-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	The expansion port name.
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

Table 51. expander-ports properties (continued)

Name	Type	Description
		• 4: Unknown • 6: Disconnected
health	string	• OK • Degraded • Fault • N/A • Unknown
health-numeric	uint32	Numeric equivalents for <code>health</code> 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.
conditions	Embedded; see health-conditions .	

expander-versions

This basetype is used by [show versions](#) when the `frus` parameter is specified.

Table 52. expander-versions properties

Name	Type	Description
name	string	Expander name.
location	string	Expander location.
enclosure-id	uint32	Enclosure ID.
drawer-id	uint8	For a 2U12 or 2U24 enclosure: • 255: N/A For a 5U84 enclosure: • 0: Top • 1: Bottom
expander-id	uint8	Expander ID.
controller	string	• A: Controller A. • B: Controller B.
controller-numeric	uint32	Numeric equivalents for <code>controller</code> values. • 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.

Table 52. expander-versions properties (continued)

Name	Type	Description
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 53. expanders properties

Name	Type	Description
durable-id	string	Expander ID.
enclosure-id	uint32	Enclosure ID.
drawer-id (5U84 enclosure)	uint8	For a 2U12 or 2U24 enclosure: 255: N/A For a 5U84 enclosure: 0: Top 1: Bottom
dom-id	uint32	For internal use only.
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 <code>path-id</code> 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 <code>status</code> values. 0: Unsupported 1: OK 2: Critical 3: Warning 4: Unrecoverable 5: Not Installed 6: Unknown 7: Unavailable

Table 53. expanders properties (continued)

Name	Type	Description
extended-status	hex32	A bitmap that represents all alert conditions active on the component. If no conditions are active, 0.
fw-revision	string	Expander firmware revision.
health	string	• OK • Degraded • Fault • Unknown • N/A
health-numeric	uint32	Numeric equivalents for <code>health</code> 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.
conditions	Embedded; see health-conditions .	
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 54. fan properties

Name	Type	Description
durable-id	string	Fan ID in the format <code>fan_enclosure-ID.fan-number</code> .
url	string	For internal use only.
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 <code>status-ses</code> values. • 0: Unsupported • 1: OK • 2: Critical • 3: Warning

Table 54. fan properties (continued)

Name	Type	Description
		• 4: Unrecoverable • 5: Not Installed • 6: Unknown • 7: Unavailable
extended-status	hex32	A bitmap that represents all alert conditions active on the component. If no conditions are active, 0.
status	string	Fan unit status. • Up • Error • Off • Missing
status-numeric	uint32	Numeric equivalents for <code>status</code> 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 <code>position</code> values. • 0: Left • 1: Right • 6: N/A
serial-number	string	• N/A: Not applicable.
part-number	string	• N/A: Not applicable.
fw-revision	string	• (blank): Not applicable. • Firmware revision of a fan FRU.
hw-revision	string	• (blank): Not applicable.
locator-led	string	Shows the state of the locator LED on a fan unit. • Off • On
locator-led-numeric	uint32	Numeric equivalents for <code>locator-led</code> values. • 0: Off • 1: On
health	string	• OK • Degraded • Fault • Unknown • N/A
health-numeric	uint32	Numeric equivalents for <code>health</code> values. • 0: OK • 1: Degraded • 2: Fault

Table 54. fan properties (continued)

Name	Type	Description
		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.
conditions	Embedded: see health-conditions .	

fan-module-versions

This basetype is used by [show versions](#) when the `frus` parameter is specified.

Table 55. fan-module-versions properties

Name	Type	Description
name	string	Fan name in the format <i>fan_enclosure-ID.fan-number</i> .
location	string	Fan location in the format <i>Enclosure enclosure-ID - position</i> . 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 56. fan-modules properties

Name	Type	Description
durable-id	string	Fan module ID.
enclosure-id	uint32	Enclosure ID.
dom-id	uint32	For internal use only.
name	string	Fan name in the format <i>fan_enclosure-ID.fan-number</i> .
location	string	Fan location in the format Enclosure<i>enclosure-ID-position</i> .
status	string	Fan module status. - Unsupported - OK - Critical - Warning - Unrecoverable - Not Installed - Unknown - Unavailable

Table 56. fan-modules properties (continued)

Name	Type	Description
status-numeric	uint32	Numeric equivalents for <code>status</code> values. 0: Unsupported 1: OK 2: Critical 3: Warning 4: Unrecoverable 5: Not Installed 6: Unknown 7: Unavailable
extended-status	hex32	A bitmap that represents all alert conditions active on the component. If no conditions are active, 0.
position	string	Fan module position, as viewed from the back of the enclosure. - Left - Right - N/A
position-numeric	uint32	Numeric equivalents for <code>position</code> values. 0: Left 1: Right 6: N/A
health	string	- OK - Degraded - Fault - N/A - Unknown
health-numeric	uint32	Numeric equivalents for <code>health</code> 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.
conditions	Embedded; see health-conditions .	
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 57. 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.

Table 57. fc-port properties (continued)

Name	Type	Description
		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 58. 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: 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.

Table 58. fde-state properties (continued)

Name	Type	Description
		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 <code>fde-security-status</code> 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 <code>year-month-day hour:minutes:seconds</code> (UTC).
fde-config-time-numeric	uint32	Unformatted <code>fde-config-time</code> value.

firmware-bundles

This basetype is used by [show firmware-bundles](#).

Table 59. firmware-bundles properties

Name	Type	Description
bundle-version	string	Version name of the firmware bundle.
build-date	string	Build date of the firmware bundle.
status	string	- Unknown - Empty - Active - Available - Inactive - Default - Last
status-numeric	uint32	Numeric equivalent for the <code>status</code> value. 0: Unknown 1: Empty 2: Active 3: Available 4: Inactive 5: Default 6: Last
health	string	- OK - Degraded - Fault - Unknown - N/A
health-numeric	uint32	Numeric equivalent for the <code>health</code> value. 0: OK 1: Degraded 2: Fault 3: Unknown

Table 59. firmware-bundles properties (continued)

Name	Type	Description
		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.

firmware-versions

This basetype is used by [show versions](#) when the `firmware` parameter is specified.

Table 60. firmware-versions properties

Name	Type	Description
bundle-version	string	Firmware bundle version.
build-date	string	Firmware bundle build date.
bundle-state	string	Firmware bundle status.
sc-fw	string	Storage Controller firmware version.
sc-fu-version	string	Storage Controller ASIC Controller version.
mc-fw	string	Management Controller firmware version.
mc-loader	string	Management Controller loader firmware version.
gem-version	string	Expander Controller GEM firmware version.
pld-rev	string	Complex Programmable Logic Device (CPLD) firmware version.
ctk-version	string	<code>version</code>: Customization Toolkit (CTK) version applied to system. <code>No CTK Version</code>: No CTK version has been applied to this system.
mcos-version	string	Management Controller operating system version.

fru-versions

This basetype is used by [show versions](#) when the `frus` parameter is specified.

Table 61. fru-versions properties

Name	Type	Description
enclosure-id	uint32	The enclosure ID.
midplane-versions	Embedded; see midplane-versions .	
expander-versions	Embedded; see expander-versions .	
fan-module-versions	Embedded; see fan-module-versions	
psu-versions	Embedded; see psu-versions .	

gateway-endpoints

This basetype is used by [show support-assist](#).

Table 62. gateway-endpoints properties

Name	Type	Description
gateway1	string	The first gateway URL, if defined.
gateway2	string	The second gateway URL, if defined.
gateway3	string	The third gateway URL, if defined.

health-conditions

This basetype is used by [show controllers](#), [show disks](#), [show disk-groups](#), [show enclosures](#), [show expander-status](#), [show fan-modules](#), [show fans](#), [show pools](#), [show power-supplies](#), [show sas-link-health](#).

Table 63. health-conditions properties

Name	Type	Description
health-reason	string	A message describing the alert condition.
health-reason-numeric	uint32	Numeric equivalent for the preceding value.
reason-id	uint32	Not used.
health-recommendation	string	The recommended action to take to resolve the alert condition.
health-recommendation-numeric	uint32	Numeric equivalent for the preceding value.

heatmaps

This basetype is used by [show workload](#).

Table 64. heatmaps properties

Name	Type	Description
sample-interval	uint16	Sample interval.
sample-count	uint16	Number of samples used for calculations.
start-sample-time	string	Datestamp for the first data sample used in calculations.
start-sample-time-numeric	uint32	Unformatted <code>start-sample-time</code> value.
stop-sample-time	string	Datestamp for the last data sample used in calculations.
stop-sample-time-numeric	uint32	Unformatted <code>stop-sample-time</code> value.
capacity-a	string	Calculated capacity for the low target.
capacity-a-numeric	uint64	Unformatted <code>capacity-a</code> value in blocks.
capacity-b	string	Calculated capacity for the medium target.
capacity-b-numeric	uint64	Unformatted <code>capacity-b</code> value in blocks.
capacity-c	string	Calculated capacity for the high target.
capacity-c-numeric	uint64	Unformatted <code>capacity-c</code> value in blocks.

host

This basetype is used by [show host-groups](#).

Table 65. 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 66. 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.
url	string	For internal use only.
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 67. 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 <i>host-group.*.*</i> , where the first * represents all hosts in the group and the second * represents all initiators in those hosts.
ini-view-mappings	Embedded; see host-view-mappings .	
ini-view-initiators	Embedded; see initiator-view .	

host-port-statistics

This basetype is used by [show host-port statistics](#).

Table 68. host-port-statistics properties

Name	Type	Description
durable-id	string	Host port ID in the format <code>hostport_controller-ID-and-port-number</code> .
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 <code>bytes-per-second</code> 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 <code>data-read</code> 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 <code>data-written</code> 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 <code>year-month-day hour:minutes:seconds</code> , when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	uint32	Unformatted <code>reset-time</code> value.
start-sample-time	string	Date and time, in the format <code>year-month-day hour:minutes:seconds</code> , when sampling started for the <code>iops</code> and <code>bytes-per-second</code> values.
start-sample-time-numeric	uint32	Unformatted <code>start-sample-time</code> value.
stop-sample-time	string	Date and time, in the format <code>year-month-day hour:minutes:seconds</code> , when sampling stopped for the <code>iops</code> and <code>bytes-per-second</code> values.
stop-sample-time-numeric	uint32	Unformatted <code>stop-sample-time</code> value.

host-view-mappings

This basetype is used by `show maps` when the `initiator` parameter is specified.

Table 69. host-view-mappings properties

Name	Type	Description
volume-name	string	Volume name.
volume-serial	string	Volume serial number.

Table 69. host-view-mappings properties (continued)

Name	Type	Description
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 70. 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. • HP-UX: The host uses Flat Space Addressing. • OpenVMS: The initiator does not allow LUN 0 to be assigned to a mapping.
profile-numeric	uint32	Numeric equivalents of <code>profile</code> values. • 0: Standard • 1 : HP-UX • 2: OpenVMS
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 <code>host-bus-type</code> values. • 0: UNKNOWN • 6: FC • 8: SAS • 9: iSCSI
id	string	• For an FC initiator, its WWPN. • For a SAS initiator, its WWPN. • For an iSCSI initiator, its node name (typically the IQN).
url	string	For internal use only.

Table 70. initiator properties (continued)

Name	Type	Description
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 71. 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. - HP-UX: The host uses Flat Space Addressing. - OpenVMS: The initiator does not allow LUN 0 to be assigned to a mapping.
host-profile-numeric	uint32	Numeric equivalents of <code>host-profile</code> values. 0: Standard 1: HP-UX 2: OpenVMS
host-view-mappings	Embedded; see host-view-mappings .	

inquiry

This basetype is used by [show inquiry](#).

Table 72. 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-address	string	The automatically configured IPv6 address, when applicable.
dhcpv6	string	The DHCP IPv6 address.
slaac-ip	string	The SLAAC IPv6 address.

Table 72. inquiry properties (continued)

Name	Type	Description
ip6-auto-address-source	string	The method used to assign or compute the automatic address: • removed "0"DHCPv6 • IPv6 SLAAC
ip6-auto-address-source-numeric	uint32	Numeric equivalent for the ip6-auto-address-source value. • 0: DHCPv6 • 1: IPv6 SLAAC
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.
nvr-am-defaults	string	For internal use only.

io-modules

This basetype is used by [show enclosures](#) for an expansion module.

Table 73. 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 <code>controller-id</code> 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 <i>year-month-day hour:minutes:seconds</i> (UTC), when the PCBA of the controller was programmed or a power supply module was manufactured.
mfg-date-numeric	uint32	Unformatted <code>mfg-date</code> 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

Table 73. io-modules properties (continued)

Name	Type	Description
position-numeric	uint32	Numeric equivalents for <code>position</code> 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 <code>rotation</code> 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 <code>phy-isolation</code> 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 <code>locator-led</code> values. 0: Off 1: On
status	string	- Operational - Down - Not installed - Unknown
status-numeric	uint32	Numeric equivalents for <code>status</code> values. 0: Operational 1: Down 2: Not installed 3: Unknown
health	string	- OK - Degraded - Fault - Unknown - N/A
health-numeric	uint32	Numeric equivalents for <code>health</code> values. 0: OK 1: Degraded

Table 73. io-modules 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 action to take to resolve the health issue.
conditions	Embedded; see health-conditions .	
unhealthy-component	Embedded; see unhealthy-component .	
enclosure-id	Embedded; see expander-ports .	
expander-details	Embedded; see expanders .	

ipv6-addresses

This basetype is used by [show ipv6-addresses](#).

Table 74. ipv6-addresses properties

Name	Type	Description
controller	string	• A: Controller A. • B: Controller B.
controller-numeric	uint32	Numeric equivalent for the <code>controller</code> value. • 0: A • 1: B
index	uint8	The controller's index value for the address. For internal use only.
address-label	string	The name assigned to the address, or blank if the address is unnamed.
ipv6-address	string	The IPv6 address with prefix length.

ipv6-network-parameters

This basetype is used by [show ipv6-network-parameters](#).

Table 75. ipv6-network-parameters properties

Name	Type	Description
controller	string	• A: Controller A. • B: Controller B.
controller-numeric	uint32	Numeric equivalents for <code>controller</code> values. • 0: A • 1: B
firewall	string	• Disabled: A network firewall is not currently active. • Enabled : A network firewall is active.
firewall-numeric	uint32	Numeric equivalents for <code>firewall</code> values. • 0: Disabled • 1: Enabled
autoconfig	string	• Enabled

Table 75. ipv6-network-parameters properties (continued)

Name	Type	Description
		Disabled
autoconfig-numeric	uint32	Numeric equivalents for autoconfig values. 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.
dhcpv6	string	The DHCP IPv6 address.
slaac-ip	string	The SLAAC IPv6 address.
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 76. 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

Table 76. iscsi-parameters properties (continued)

Name	Type	Description
		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. - 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 <code>iscsi-speed</code> 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 77. 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 <code>sfp-status</code> values. 0: Not compatible 1: Incorrect protocol 2: Not present 3: OK
sfp-present	string	Shows whether the port contains an SFP.

Table 77. iscsi-port properties (continued)

Name	Type	Description
		• 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-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	string	The link length (in meters) that is supported by the SFP while operating in compliance with applicable standards for the cable type.

ldap-parameters

This basetype is used by [show ldap-parameters](#).

Table 78. ldap-parameters properties

Name	Type	Description
ldap-protocol	string	Shows whether LDAP support is enabled or disabled.
ldap-protocol-numeric	uint32	Numeric equivalent for the ldap-protocol value. • 0: Disabled • 1: Enabled
user-search-base	string	Attributes that define where to start searching for users in the LDAP directory tree.
ldap-server	string	The IP address or domain name of the primary LDAP server.
ldap-port	uint32	The port number to use for communication with the primary LDAP server. If not set, shows 636.
alternate-ldap-server	string	The address of the alternate LDAP server.
alternate-ldap-port	uint32	The port number to use for communication with the alternate LDAP server. If not set, shows 636.

license

This basetype is used by [show license](#).

Table 79. 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.
max-snapshots-expiry-numeric	uint32	Numeric equivalents for max-snapshots-expiry values. 0: Never
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.
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.
performance-tier-expiry-numeric	uint32	Numeric equivalents for performance-tier-expiry values. 0: Never
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

Table 79. license properties (continued)

Name	Type	Description
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.
remote-snapshot-replication-expiry-numeric	uint32	Numeric equivalents for remote-snapshot-replication values. 0: Never
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. 0: Disabled 1: Enabled
vds-expiry	string	Shows when the VDS (Virtual Disk Service) Hardware Provider will expire. Never: License and doesn't expire.
vds-expiry-numeric	uint32	Numeric equivalents for vds-expiry values. 0: Never
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.
vss-expiry-numeric	uint32	Numeric equivalents for vss-expiry values. 0: Never
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.

Table 79. license properties (continued)

Name	Type	Description
		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.
sra-expiry-numeric	uint32	Numeric equivalents for sra-expiry values. 0: Never

local-ports

This basetype is used by [show peer-connections](#).

Table 80. 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 81. 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 82. 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.

Table 82. log-header-table properties (continued)

Name	Type	Description
log-timestamp	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> (UTC), when log content was saved to the file.
log-timestamp-numeric	uint32	Unformatted <code>log-timestamp</code> value.

logon-user-detail

This basetype is used by `whoami`.

Table 83. logon-user-detail properties

Name	Type	Description
logon-user	string	The user name.
logon-user-type	string	• <code>Local</code>: The user's credentials reside in the storage system. • <code>LDAP</code>: The user's credentials reside in an Active Directory LDAP server.
logon-usergroup	string	The group name for an LDAP user, or N/A for a local user.

metrics-list

This basetype is used by `show metrics-list`.

Table 84. metrics-list properties

Name	Type	Description
name	string	The name of the metrics list.
started	string	Shows whether metrics retention has started or not. • Yes • No
started-numeric	uint32	Numeric equivalent for the <code>started</code> value. • 1: Yes • 2: No
type	string	The type of storage object in the metrics list. Possible types are: <code>Controller</code> , <code>Host-port</code> , <code>Pool</code> , <code>System</code> , <code>Volume</code> , N/A (Not Applicable).
type-numeric	uint32	Numeric equivalent for the <code>type</code> value. • 0: N/A • 1: Controller • 2: Host-port • 3: System • 4: Volume • 5: Pool
field	string	The metric name.
field-numeric	uint32	Numeric equivalent for the <code>field</code> value. • 0: time • 1: total-bytes-per-second • 2: total-iops • 3: total-max-response-time • 4: total-num-bytes

Table 84. metrics-list properties (continued)

Name	Type	Description
		• 5: read-iops • 6: write-iops • 7: read-bytes-per-second • 8: write-bytes-per-second • 9: read-io-count • 10: write-io-count • 11: read-num-bytes • 12: write-num-bytes • 13: total-avg-response-time • 14: read-avg-response-time • 15: write-avg-response-time • 16: read-max-response-time • 17: write-max-response-time • 18: read-avg-queue-depth • 19: write-avg-queue-depth • 20: small-destages • 21: write-full-stripe-destages • 22: read-ahead-ops • 23: write-cache-space • 24: write-cache-percent
serial-number	string	The serial number of the storage object.
time-start	string	The date and time when the metrics retention started.
time-start-numeric	uint32	Unformatted <code>time-start</code> value.
time-end	string	The date and time when the metrics retention ended.
time-end-numeric	uint32	Unformatted <code>time-end</code> value.

mgmt-hostnames

This basetype is used by [show dns-management-hostname](#).

Table 85. mgmt-hostnames properties

Name	Type	Description
controller	string	• A: Controller A. • B: Controller B.
controller-numeric	uint32	Numeric equivalent for the <code>controller</code> value. • 0: B • 1: A
mgmt-hostname	string	The controller's management host name.
domain-name	string	The controller's FQDN if available.
default-hostname	string	• Enabled • Disabled
default-hostname-numeric	uint32	Numeric equivalent for the <code>default-hostname</code> value. • 0: Disabled • 1: Enabled

midplane-versions

This basetype is used by `show versions` when the `frus` parameter is specified.

Table 86. 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 87. network-parameters properties

Name	Type	Description
durable-id	string	Controller network port ID in the format <code>mgmtport_controller-ID</code>
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.
addressing-mode-numeric	uint32	Numeric equivalents for <code>addressing-mode</code> 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 <code>link-speed</code> 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.

Table 87. network-parameters properties (continued)

Name	Type	Description
		• 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
auto-negotiation	string	Not supported.
auto-negotiation-numeric	uint32	Not supported.
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 88. 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	• Date and time, in the format <i>year-month-day hour:minutes:seconds</i> (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 89. 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 90. 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 <code>connection-type</code> values. • 1: FC • 2: iSCSI
connection-status	string	• Online: The systems have a valid connection. • Offline: No connection is available to the remote system.
connection-status-numeric	uint32	Numeric equivalents for <code>connection-status</code> values.
health	string	• OK • Fault • Unknown
health-numeric	uint32	Numeric equivalents for <code>health</code> values. • 0: OK • 2: Fault • 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.

Table 90. peer-connections properties (continued)

Name	Type	Description
local-ports	Embedded;	see local-ports .
remote-ports	Embedded;	see remote-ports .

peer-controllers

This basetype is used by [query peer-connection](#).

Table 91. peer-controllers properties

Name	Type	Description
controller	string	• A: Controller A. • B: Controller B.
controller-numeric	uint32	Numeric equivalents for <code>controller</code> 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.
ip6-address-1	string	First IPv6 address for the controller management port, if set.
ip6-address-2	string	Second IPv6 address for the controller management port, if set.
ip6-address-3	string	Third IPv6 address for the controller management port, if set.
ip6-address-4	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 92. 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: • FC • iSCSI • Unknown
connection-type-numeric	uint32	Numeric equivalents for <code>connection-type</code> values.

Table 92. peer-ports properties (continued)

Name	Type	Description
		• 0: Unknown • 6: FC • 9: iSCSI
host-port-health	string	• Up • Down • Degraded • SFP Issue • Unknown
host-port-health-numeric	uint32	Numeric equivalents for <code>host-port-health</code> values. • 0: Unknown • 1, 6, 7, 8: Down • 2, 4, 5: Up • 3: Degraded • 9: SFP Issue
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 93. 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 <code>total-data-transferred</code> value.
data-read	string	The amount of data read since the last sampling time.
data-read-numeric	uint64	Unformatted <code>data-read</code> value.
data-written	string	The amount of data written since the last sampling time.
data-written-numeric	uint64	Unformatted <code>data-written</code> value.
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 <code>total-bytes-per-second</code> 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 <code>read-bytes-per-second</code> value.

Table 93. pool-hist-statistics properties (continued)

Name	Type	Description
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 <code>write-bytes-per-second</code> 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 <code>year-month-day hour:minutes:seconds</code> , when the data sample was taken.
sample-time-numeric	uint32	Unformatted sample-time value.

pools

This basetype is used by [show configuration](#) and [show pools](#).

Table 94. 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. - Virtual: Virtual pool.
storage-type-numeric	uint32	Numeric equivalents for <code>storage-type</code> 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	uint64	Unformatted <code>total-size</code> value in blocks.
total-avail	string	The available capacity in the pool.
total-avail-numeric	uint64	Unformatted <code>total-avail</code> value in blocks.
snap-size	string	Not applicable.
snap-size-numeric	uint64	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 pool uses thin provisioning, which means that more capacity can be allocated to volumes than physically exists in the pool. - N/A: Not applicable (linear pool).
overcommit-numeric	uint32	Numeric equivalents for <code>overcommit</code> values. 0: Disabled 1: Enabled 2: N/A

Table 94. pools properties (continued)

Name	Type	Description
over-committed	string	• True: The pool is overcommitted. • False: The pool is not overcommitted.
over-committed-numeric	uint32	Numeric equivalents for <code>over-committed</code> values. • 0: False • 1: True
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 <code>page-size</code> 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. • DRSC: The disk group is being scrubbed. • EXPD: The disk group is being expanded. • INIT: The disk group is initializing. • PRERCON: At least one disk in the disk group is being preemptively reconstructed. • RBAL: The ADAPT disk group is being rebalanced. • RCON: At least one disk in the disk group is being reconstructed. • REFT: The ADAPT disk group's fault-tolerant stripes are being rebalanced. • 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. • REMV: 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.
utility-running-numeric	uint32	Numeric equivalents for <code>utility-running</code> values. • 0: blank • 2: INIT • 3: RCON • 4: VRFY • 5: EXPD • 6: VRSC • 7: DRSC • 9: REMV • 12: VPREP • 13: VDRAIN • 14: VRECV • 15: PRERCON • 16: RBAL • 17: REFT

Table 94. pools properties (continued)

Name	Type	Description
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 <code>preferred-owner</code> 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 <code>owner</code> 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	string	For internal use only.
idle-page-check	string	For internal use only.
idle-page-check-numeric	uint32	For internal use only.
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 <code>metadata-vol-size</code> 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 <code>total-rfc-size</code> 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 <code>available-rfc-size</code> value in blocks.
reserved-size	string	The total number of pages that are reserved for virtual volumes in the pool.
reserved-size-numeric	uint64	Unformatted <code>reserved-size</code> 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	uint64	Unformatted <code>reserved-unalloc-size</code> 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

Table 94. pools properties (continued)

Name	Type	Description
		sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries. • <code>Mixed</code>: 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).
<code>pool-sector-format-numeric</code>	<code>uint32</code>	Numeric equivalents for <code>pool-sector-numeric</code> values. • 0: 512n • 1: 512e • 3: <code>Mixed</code>
<code>metadata-allocated</code>	<code>string</code>	Pool metadata currently in use.
<code>metadata-allocated-numeric</code>	<code>uint64</code>	Unformatted <code>metadata-allocated</code> value in blocks.
<code>metadata-available</code>	<code>string</code>	Pool metadata available capacity.
<code>metadata-available-numeric</code>	<code>uint64</code>	Unformatted <code>metadata-available</code> value in blocks.
<code>metadata-total-size</code>	<code>string</code>	Disk group metadata total size.
<code>metadata-total-size-numeric</code>	<code>uint64</code>	Unformatted <code>metadata-total-size</code> value in blocks.
<code>extended-status</code>	<code>uint64</code>	A bitmap that represents all alert conditions active on the component. If no conditions are active, 0.
<code>health</code>	<code>string</code>	• <code>OK</code> • <code>Degraded</code> • <code>Fault</code> • <code>N/A</code> • <code>Unknown</code>
<code>health-numeric</code>	<code>uint32</code>	Numeric equivalents for <code>health</code> values. • 0: <code>OK</code> • 1: <code>Degraded</code> • 2: <code>Fault</code> • 3: <code>Unknown</code> • 4: <code>N/A</code>
<code>health-reason</code>	<code>string</code>	If <code>Health</code> is not <code>OK</code> , the reason for the health state.
<code>health-reason-numeric</code>	<code>uint32</code>	Numeric equivalent for the preceding value.
<code>health-recommendation</code>	<code>string</code>	If <code>Health</code> is not <code>OK</code> , the recommended actions to take to resolve the health issue.
<code>health-recommendation-numeric</code>	<code>uint32</code>	Numeric equivalent for the preceding value.
<code>disk-groups</code>	Embedded; see disk-groups .	
<code>tiers</code>	Embedded; see tiers .	
<code>unhealthy-component</code>	Embedded; see unhealthy-component .	

pool-statistics

This basetype is used by [show pool-statistics](#).

Table 95. pool-statistics properties

Name	Type	Description
sample-time	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> , when the data sample was taken.
sample-time-numeric	uint32	Unformatted <code>sample-time</code> 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.
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 96. 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 .	

port

This basetype is used by [show configuration](#) and [show ports](#).

Table 97. port properties

Name	Type	Description
durable-id	string	Controller host port ID in the format <code>hostport_controller-ID-and-port-number</code> .
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.
url	string	For internal use only.
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

Table 97. port properties (continued)

Name	Type	Description
		• 3: Not Present • 6: Disconnected
actual-speed	string	Actual link speed in Mbit/s or Gbit/s. • 10Mb • 100Mb • 1Gb • 4Gb • 6Gb • 8Gb • 12Gb • 16Gb • (blank): Port is disconnected.
actual-speed-numeric	uint32	Numeric equivalents for actual-speed values. • 0: 1Gb • 1: 2Gb • 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
fan-out	uint8	Not supported.
health	string	• OK • Degraded • Fault • N/A • Unknown
health-numeric	uint32	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown

Table 97. port properties (continued)

Name	Type	Description
		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 98. power-supplies properties

Name	Type	Description
durable-id	string	Power supply ID in the format <i>psu_enclosure-ID.power-supply-number</i> .
url	string	For internal use only.
enclosure-url	string	For internal use only.
enclosure-id	uint32	Enclosure ID.
dom-id	uint32	For internal use only.
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, 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 <i>position</i> 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 <i>year-month-day hour:minutes:seconds</i> (UTC), when the power supply module was manufactured.
mfg-date-numeric	uint32	Unformatted <i>mfg-date</i> value.

Table 98. power-supplies properties (continued)

Name	Type	Description
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.
dc5v		
dc33v		
dc12i		
dc5i		
dctemp		
health	string	• OK • Degraded • Fault • N/A • Unknown
health-numeric	uint32	Numeric equivalents for <code>health</code> 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 <code>status</code> values. • 0: Up • 1: Warning • 2: Error • 3: Not Present • 4: Unknown
conditions	Embedded; see <code>health-conditions</code> .	
unhealthy-component	Embedded; see unhealthy-component .	
fan-details	Embedded; see fan .	

product-info

This basetype is used by [show inquiry](#).

Table 99. 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.
scsi-product-id	string	Product name returned by the SCSI INQUIRY command.

provisioning

This basetype is used by [show provisioning](#).

Table 100. provisioning properties

Name	Type	Description
volume	string	- Volume name. - Blank if the pool does not have a volume.
volume-serial	string	Volume serial number.
wwn	string	- Volume World Wide Name. - Blank if the pool does not have a volume.
controller	string	Owning controller of the pool. - A : Controller A. - B : Controller B.
controller-numeric	uint32	Numeric equivalents for <code>controller</code> values. 0 : B 1 : A
disk-display	string	Shorthand list of the disks within a pool.
disk-display-full	string	List or range of the disks in the pool specified by the <code>virtual-disk</code> property.
virtual-disk	string	Name of the pool.
virtual-disk-serial	string	Serial number of the pool.
health	string	Health of the associated pool. - OK - Degraded - Fault - N/A - Unknown
health-numeric	uint32	Numeric equivalents for <code>health</code> 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 101. 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 <code>proxy-state</code> values. 0 : Disabled 1 : Enabled
protocol	string	- HTTP - HTTPS
protocol-numeric	uint32	Numeric equivalents for protocol values. 0 : HTTP 1 : HTTPS
host	string	The proxy host ID.
port	string	The proxy host port number.
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 102. psu-versions properties

Name	Type	Description
name	string	Power supply unit (PSU) name in the format <code>PSU enclosure-ID, position</code> .
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 103. 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.

Table 103. readcache-hist-statistics properties (continued)

Name	Type	Description
total-data-transferred	string	The total amount of data read and written since the last sampling time.
total-data-transferred-numeric	uint64	Unformatted <code>total-data-transferred</code> value.
data-read	string	The amount of data read since the last sampling time.
data-read-numeric	uint64	Unformatted <code>data-read</code> value.
data-written	string	The amount of data written since the last sampling time.
data-written-numeric	uint64	Unformatted <code>data-written</code> value.
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 <code>total-bytes-per-second</code> 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 <code>read-bytes-per-second</code> 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 <code>write-bytes-per-second</code> 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 <i>year-month-day hour:minutes:seconds</i> , when the data sample was taken.
sample-time-numeric	uint32	Unformatted <code>sample-time</code> value.

redundancy

This basetype is used by `show redundancy-mode`.

Table 104. redundancy properties

Name	Type	Description
redundancy-mode	string	The operating mode of the system, also called the cache redundancy mode. • <code>Active-Active ULP</code> : 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. • <code>Single Controller</code> : The enclosure contains a single controller. • <code>Failed Over</code> : Operation has failed over to one controller because its partner is not operational. The system has lost redundancy. • <code>Down</code> : Both controllers are not operational.
redundancy-mode-numeric	uint32	Numeric equivalents for <code>redundancy-mode</code> values. • <code>8</code> : <code>Active-Active ULP</code>

Table 104. redundancy properties (continued)

Name	Type	Description
		• 9: Single Controller • 10: Failed Over • 11: Down
redundancy-status	string	• Operational but not redundant : 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 • 2: Redundant • 4: Down • 5: Unknown
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. • Operational: The partner Management Controller is responding normally. • Not Operational: The local Management Controller has established communication with the partner Management Controller, but the partner is not responding because it is not currently in active-active or failed-over state. • Not Communicating: The partner Management Controller is not ready to communicate. • Unknown: The operational status of the partner Management Controller cannot be determined.
other-MC-status-numeric	uint32	Numeric equivalents for other-mc-status values. • 4749: Operational • 3231: Not Operational • 1524: Not Communicating

Table 104. redundancy properties (continued)

Name	Type	Description
		1496: Unknown
system-ready	string	Shows whether the system is ready for running a script. - Ready: The system is ready. - Not Ready: The system is not ready.
system-ready-numeric	uint32	Numeric equivalent for the <code>system-ready</code> value. 00: Ready 11: Not Ready
local-ready	string	Shows the local controller's contribution towards <code>system-ready</code> . - Ready: The local controller's contribution is ready. - Storage Controller is Not Ready: The Storage Controller's contribution is not ready. - Management Controller is Not Ready: The Management Controller's contribution is not ready. - Activity is currently in progress: A partner firmware update, firmware installation, or log retrieval is in progress. Wait for that operation to complete and try again.
local-ready-numeric	uint32	Numeric equivalent for the <code>local-ready</code> value. 0: Ready 1: Storage Controller is Not Ready 2: Management Controller is Not Ready 3: Activity is currently in progress
local-reason	string	The explanation for the <code>local-ready</code> value.
other-ready	string	Shows the partner controller's contribution towards <code>system-ready</code> . - Ready: The partner controller's contribution is ready. - Storage Controller is Not Ready: The Storage Controller's contribution is not ready. - Management Controller is Not Ready: The Management Controller's contribution is not ready. - Activity is currently in progress: A partner firmware update, firmware installation, or log retrieval is in progress. Wait for that operation to complete and try again.
other-ready-numeric	uint32	Numeric equivalent for the <code>other-ready</code> value. 0: Ready 1: Storage Controller is Not Ready 2: Management Controller is Not Ready 3: Activity is currently in progress
other-reason	string	The explanation for the <code>other-ready</code> value.

remote-ports

This basetype is used by [show peer-connections](#).

Table 105. 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 106. remote-ports-detail properties

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 107. remote-system properties

Name	Type	Description
id	string	Remote system ID.
system-name	string	- The name of the remote system. <code>Uninitialized Name</code> : The default value.
system-contact	string	- The name of the person who administers the remote system. <code>Uninitialized Contact</code> : The default value.
system-location	string	- The location of the remote system. <code>Uninitialized Location</code> : The default value.
system-information	string	- A brief description of the remote system. <code>Uninitialized Info</code> : 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. <code>Not Present</code>
ip-address-b	string	- The IP address of the network port in controller B in the remote system. <code>Not Present</code>
username	string	The name of a user that is configured in the remote system. This must be a user with the <code>manage</code> role to remotely configure or provision that system.
status	string	<code>Uninitialized</code> : This system hasn't communicated with the remote system. <code>Ready</code> : This system has contacted the remote system and it is ready to use. <code>Connected</code> : This system is transferring data to the remote system. <code>Not Connected</code> : The system is not connected to the remote system.
status-numeric	uint32	Numeric equivalents for <code>status</code> values. <code>0</code> : <code>Uninitialized</code> <code>1</code> : <code>Ready</code> <code>2</code> : <code>Connected</code> <code>4</code> : <code>Not Connected</code>
last-connected	string	Date and time, in the format <code>year-month-day hour:minutes:seconds</code> (UTC), when successful communication was last established between the

Table 107. remote-system properties (continued)

Name	Type	Description
		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
interfaces-numeric	uint32	Numeric equivalents for <code>interfaces</code> values. • 0: FC • 1: iSCSI • 2: SAS
storage-model	string	• LINEAR
storage-model- numeric	uint32	Numeric equivalents for <code>storage-model</code> values. • 0: LINEAR • 1: Paged
invalid-ip-a	string	• <code>False</code> : The IP address is not valid for controller module A in the remote system. • <code>True</code> : The IP address is valid for controller module A in the remote system.
invalid-ip-a- numeric	uint32	Numeric equivalents for <code>invalid-ip-a</code> values. • 0: <code>False</code> • 1: <code>True</code>
invalid-ip-b	string	• <code>False</code> : The IP address is not valid for controller B in the remote system. • <code>True</code> : The IP address is valid for controller B in the remote system.
invalid-ip-b- numeric	uint32	Numeric equivalents for <code>invalid-ip-b</code> values. • 0: <code>False</code> • 1: <code>True</code>

replication-snapshot-history

This basetype is used by `show replication-snapshot-history`.

Table 108. 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. • <code>disabled</code>: A snapshot history will not be kept. • <code>secondary</code>: A snapshot history set will be kept on the secondary system for the secondary volume. • <code>both</code> : 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 <code>snapshot-history</code> values. • 0: <code>disabled</code> • 1: <code>secondary</code> • 2: <code>both</code>

Table 108. replication-snapshot-history properties (continued)

Name	Type	Description
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 <code>set snapshot-space</code> 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. • <code>never-delete</code>: Snapshots will never be deleted automatically to make space. The oldest snapshot in the snapshot history will be deleted once the <code>snapshot-count</code> value has been exceeded. • <code>high</code>: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted. • <code>medium</code>: Snapshots can be deleted after all eligible low-priority snapshots have been deleted. • <code>low</code>: Snapshots can be deleted.
retention- priority-numeric	uint32	Numeric equivalents for <code>retention-priority-numeric</code> values. • <code>0</code>: <code>never-delete</code> • <code>1</code>: <code>low</code> • <code>2</code>: <code>medium</code> • <code>3</code>: <code>high</code>
current- replication-snapshots	Embedded; see current-replication-snapshots .	

reset-snapshot-tasks

This basetype is used by [show tasks](#) for a `ResetSnapshot` operation.

Table 109. 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 110. resettable-statistics properties

Name	Type	Description
serial-number	string	The serial number of the pool or tier.
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.

Table 110. resettable-statistics properties (continued)

Name	Type	Description
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 <code>data-read</code> 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 <code>data-written</code> 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 <code>bytes-per-second</code> 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 111. 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	hex32	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	hex32	The number of times the PHY has lost doubleword synchronization and restarted the Link Reset sequence.
invalid-dwords	hex32	The number of invalid doublewords that have been received by the PHY, not including those received during Link Reset sequences.
reset-error-counter	hex32	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 112. sas-port properties

Name	Type	Description
configured-topology	string	Direct
configured-topology-numeric	uint32	0: 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 <code>Warning</code> , the health will change to <code>Degraded</code> , 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 113. sas-status-controller-a properties

Name	Type	Description
enclosure-id	uint32	Enclosure ID.
drawer-id	uint8	For a 2U12 or 2U24 enclosure: 255 : N/A For a 5U84 enclosure: 0: Top 1: Bottom
baseplane-id	uint8	Baseplane ID.
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. 0: Unknown 1: Drive

Table 113. sas-status-controller-a properties (continued)

Name	Type	Description
		• 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. • Drive: Drive slot PHY. • SC-P: Storage Controller primary PHY. • SC-A: Storage Controller alternate PHY. • Expander-Universal-0: Expansion port 0 universal PHY. • Expander-Universal-1: Expansion port 1 universal PHY. • Expander-Universal-2: Expansion port 2 universal PHY. • Drawer0-Ingress-0: Drawer 0 ingress PHY 0. • Drawer0-Ingress-1: Drawer 0 ingress PHY 1. • Drawer0-Ingress-2: Drawer 0 ingress PHY 2. • Drawer0-Egress-0: Drawer 0 egress PHY 0. • Drawer0-Egress-1: Drawer 0 egress PHY 1. • Drawer0-Egress-2: Drawer 0 egress PHY 2. • Drawer1-Ingress-0: Drawer 1 ingress PHY 0. • Drawer1-Ingress-1: Drawer 1 ingress PHY 1. • Drawer1-Ingress-2: Drawer 1 ingress PHY 2. • Drawer1-Egress-0: Drawer 1 egress PHY 0. • Drawer1-Egress-1: Drawer 1 egress PHY 1. • Drawer1-Egress-2: Drawer 1 egress PHY 2.
status	string	PHY status. • <code>Unavailable</code> : No status information is available. • <code>Enabled - Healthy</code> : The PHY is enabled and healthy • <code>Enabled - Degraded</code> : The PHY is enabled but degraded. • <code>Disabled</code> : The PHY has been disabled by a user or by the system.
status-numeric	uint32	Numeric equivalents for <code>status</code> values. • 0: <code>Unavailable</code> • 1: <code>Enabled - Healthy</code> • 2: <code>Enabled - Degraded</code> • 3: <code>Disabled</code>
elem-status	string	The SES status that corresponds to the PHY status. • <code>Disabled</code> : Critical condition is detected. • <code>Error</code> : Unrecoverable condition is detected. Appears only if there is a firmware problem related to PHY definition data. • <code>Non-critical</code> : Non-critical condition is detected. • <code>Not Used</code> : Element is not installed in enclosure. • <code>Unknown</code> : 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.

Table 113. sas-status-controller-a properties (continued)

Name	Type	Description
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
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. • Firmware reboot: PHY disabled because of a firmware reboot. • 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 • 7: Firmware reboot • 8: Disk removed • 9: Unused - disabled by default • 10: Excessive PHY changes • 11: Did not initialize
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.

Table 113. sas-status-controller-a properties (continued)

Name	Type	Description
crc-errors	hex32	In a sequence of SAS transfers (frames), the data is protected by a cyclic redundancy check (CRC) value. The <code>crc-errors</code> 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.

schedules

This basetype is used by [show schedules](#).

Table 114. schedules properties

Name	Type	Description
name	string	Schedule name.
schedule-specification	string	Schedule settings for running the associated task.
status	string	Schedule status. • <code>Uninitialized</code> : The schedule is not yet ready to run. • <code>Ready</code> : The schedule is ready to run at the next scheduled time. • <code>Suspended</code> : The schedule had an error and is holding in its current state. • <code>Expired</code> : The schedule has exceeded a constraint and will not run again. • <code>Invalid</code> : The schedule is invalid. • <code>Deleted</code> : The task has been deleted.
next-time	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> (UTC), when the schedule will next run, or N/A if the schedule has expired.
next-time-numeric	uint32	Unformatted <code>next-time</code> value.
last-initiated	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> (UTC), when the schedule was last run, or N/A if the schedule has not yet run.
last-initiated-numeric	uint32	Unformatted last-initiated 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. • Blank if no error occurred.
task	Embedded; see tasks .	

security-communications-protocols

This basetype is used by [show protocols](#).

Table 115. 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.
smis-numeric	uint32	Numeric equivalents for smis values. 0: Disabled
usmis	string	Disabled : The unsecure SMI-S interface is disabled.
usmis-numeric	uint32	Numeric equivalents for smis values. 0: Disabled
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

Table 115. security-communications-protocols properties (continued)

Name	Type	Description
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
activity-progress	string	Disabled : Access to the activity progress interface via HTTP port 8081 is disabled.
activity-progress-numeric	uint32	Numeric equivalents for activity-progress values. 0: Disabled

sensors

This basetype is used by [show sensor-status](#).

Table 116. sensors properties

Name	Type	Description
durable-id	string	Sensor ID.
enclosure-id	uint32	Enclosure ID.
drawer-id	string	For a 2U12 or 2U24 enclosure: 255: N/A For a 5U84 enclosure: 0 : Top 1 : Bottom
drawer-id-numeric	uint8	For a 2U12 or 2U24 enclosure: Not applicable. For a 5U84 enclosure: 0 : Top 1 : Bottom
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.

Table 116. sensors properties (continued)

Name	Type	Description
		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. - 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
container	string	Hardware component that contains the sensor. - baseplane - controllers - drawer - enclosures - fan - iom - midplane - power-supplies
container-numeric	uint32	Numeric equivalents for container values. 14: enclosures 15: midplanes 16: controllers 17: iom 18: power-supplies 19: fan 28: drawer 41: baseplane
sensor-type	string	- Temperature - Voltage - Current - Charge Capacity - Capacitance - Resistance - Unknown Type
sensor-type-numeric	uint32	Numeric equivalents for sensor-type values.

Table 116. sensors properties (continued)

Name	Type	Description
		• 0: Temperature • 1: Current • 2: Voltage • 3: Charge Capacity • 4: Capacitance • 5: Resistance • 6: Unknown Type

service-tag-info

This basetype is used by [show service-tag-info](#).

Table 117. service-tag-info properties

Name	Type	Description
enclosure-id	uint8	Enclosure ID.
service-tag	string	An alphanumeric string that uniquely identifies the product.

sessions

This basetype is used by [show sessions](#).

Table 118. sessions properties

Name	Type	Description
sessionId	string	The session ID.
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.
locale	string	The display language.
locale-numeric	uint32	Numeric equivalents for locale values. • 0: English • 3: Spanish • 4: French • 5: German • 7: Japanese • 8: Korean • 11: Chinese-simplified
host	string	For a CLI session, the IP address and port number of the connected system.
state	string	• 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 <code>first-access-numeric</code> value.

Table 118. sessions properties (continued)

Name	Type	Description
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 <code>last-access-numeric</code> value.

show-other-MC-status

This basetype is used by `show shutdown-status`.

Table 119. show-other-MC-status properties

Name	Type	Description
other-MC	string	Other MC Status
other-MC-status	string	The operational status of the Management Controller in the partner controller. This is not factored into system health. • <code>Operational</code>: The partner Management Controller is responding normally. • <code>Not Operational</code>: The local Management Controller has established communication with the partner Management Controller, but the partner is not responding because it's not currently in active-active or failed-over state. • <code>Not Communicating</code>: The partner Management Controller is not ready to communicate. • <code>Unknown</code>: The operational status of the partner Management Controller cannot be determined.
other-MC-status-numeric	uint32	Numeric equivalents for <code>other-mc-status</code> values. • <code>1524</code>: <code>Not Communicating</code> • <code>3231</code>: <code>Not Operational</code> • <code>4749</code>: <code>Operational</code> • <code>1496</code>: <code>Unknown</code>

shutdown-status

This basetype is used by `show shutdown-status`.

Table 120. shutdown-status properties

Name	Type	Description
controller	string	• <code>A</code> : Controller A. • <code>B</code> : Controller B.
status	string	• <code>up</code> : The controller is operational. • <code>down</code> : The controller is shut down. • <code>not installed</code> : The controller is not installed.
status-numeric	uint32	Numeric equivalents for <code>status</code> values. • <code>0</code> : <code>up</code> • <code>1</code> : <code>down</code> • <code>2</code> : <code>not installed</code>

sideplanes

This basetype is used by `show enclosures`.

Table 121. sideplanes properties

Name	Type	Description
durable-id	string	Sideplane ID.
enclosure-id	uint32	Enclosure ID.
drawer-id	uint8	0 : Top 1 : Bottom 255: Not applicable.
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.
path-id-numeric	uint32	Numeric equivalents for path-id values. 0: B 1: A
name	string	Sideplane name.
location	string	Location name.
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

Table 121. sideplanes properties (continued)

Name	Type	Description
		• N/A • Unknown
health-numeric	uint32	Numeric equivalents for <code>health</code> 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 .	
expander-details	Embedded; see expanders .	

snapshots

This basetype is used by [show snapshots](#).

Table 122. snapshots properties

Name	Type	Description
durable-id	string	Snapshot ID.
virtual-disk-name	string	Deprecated.
storage-pool-name	string	The name of the pool that contains the snapshot.
storage-pools-url	string	Deprecated.
serial-number	string	Snapshot serial number.
name	string	Snapshot name.
url	string	For internal use only.
creation-date-time	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> (UTC), when the snapshot was prepared or committed.
creation-date-time-numeric	uint32	Unformatted <code>creation-date-time</code> value.
status	string	Snapshot status. • Available • Unavailable: See the <code>status-reason</code> 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 <code>status-reason</code> values.

Table 122. snapshots properties (continued)

Name	Type	Description
		• 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	Deprecated.
volume-parent	string	The name of the volume of which the snapshot was taken.
volume-parent	string	Not applicable.
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	Not applicable.
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.
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. This is the default. • 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.

Table 122. snapshots properties (continued)

Name	Type	Description
snapshot-type	string	Snapshot type. - Standard snapshot : Snapshot of a source volume that consumes a snapshot license. - N/A
snapshot-type-numeric	uint64	Numeric equivalents for snapshot-type values. 0x04000: Standard snapshot 254: N/A
storage-type	string	Virtual
storage-type-numeric	uint64	Numeric equivalents for storage-type values. 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 123. snapshot-with-retention-tasks properties

Name	Type	Description
master-volume-name	string	Source volume name.
master-volume-serial	string	Source volume serial number.
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-space

This basetype is used by [show snapshot-space](#).

Table 124. 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 equivalent for the snap-limit-size value.
allocated-percent-pool	string	The percentage of the pool currently used by snapshots.
allocated-percent-snap-space	string	The percentage of the snapshot space currently used by snapshots.
allocated-size	string	The actual amount of space currently used by snapshots.

Table 124. snap-space properties (continued)

Name	Type	Description
allocated-size-numeric	uint64	Numeric equivalent for the <code>allocated-size</code> value.
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. • <code>Notify Only</code>: When the snapshot space is reached an event is generated and logged. • <code>Delete Snapshots</code>: When the snapshot space is reached an event is generated and logged and automatic deletion of snapshots occurs.
limit-policy-numeric	uint32	Numeric equivalent for the <code>limit-policy</code> value. • 0: <code>Notify Only</code> • 1: <code>Delete Snapshots</code>

snap-tasks

This basetype is used by `show tasks` for a `TakeSnapshot` task that has created at least one snapshot.

Table 125. 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 126. snmp-parameters properties

Name	Type	Description
snmp-enabled	string	Shows whether the Simple Network Management Protocol (SNMP) interface is enabled or disabled. • <code>Disabled</code>—SNMP is disabled. • <code>Enabled</code>—SNMP is enabled.
snmp-enabled- numeric	uint32	Numeric equivalents for <code>snmp-enabled</code> values. • 0: <code>Disabled</code> • 1: <code>Enabled</code>
snmp-filter	string	Minimum level of events to include for SNMP traps • <code>crit</code>—Sends notifications for Critical events only. • <code>error</code>—Sends notifications for Error and Critical events. • <code>warn</code>—Sends notifications for Warning, Error, and Critical events. • <code>resolved</code>—Sends notifications for Resolved, Warning, Error, and Critical events. • <code>info</code>—Sends notifications for all events. • <code>none</code>—No events are sent as traps and traps are disabled.
snmp-filter- numeric	uint32	Numeric equivalents for <code>snmp-filter</code> values.

Table 126. snmp-parameters properties (continued)

Name	Type	Description
		0: info 1: resolved 2: warn 3: error 4: crit 5: none
snmp-trap-host-1	string	Trap host IP address.
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 <code>monitor</code> role and is shown in clear text for users having the <code>manage</code> role.
snmp-write- community	string	The community string for write access. The value is obscured for users having only the <code>monitor</code> role and is shown in clear text for users having the <code>managerole</code> .
alert-notification	string	Shows whether the system will send SNMP notifications for alerts. <code>all</code>: The system will send SNMP notifications for alerts. <code>none</code>: The system will not send SNMP notifications for alerts.
alert-notification-numeric	uint32	Numeric equivalent for the alert-notification value. 5: none 6: all
persistent-alerts	string	Not supported.
persistent-alerts-numeric	uint32	Not supported.

spares-preview

This basetype is used by [add storage](#) when the `preview` parameter is specified.

Table 127. spares-preview properties

Name	Type	Description
location	string	The disk location in the format <i>enclosure-number.disk-number</i> .
type	string	Disk description. <code>SAS</code>: Enterprise SAS spinning disk. <code>SAS MDL</code>: Midline SAS spinning disk. <code>SSD SAS</code>: SAS solid-state disk.
type-numeric	uint32	Numeric equivalents for the type value. 4: SAS 8: SSD SAS 11: SAS MDL
tier	string	<code>N/A</code> <code>Performance</code>: The disk group is in the highest storage tier, which uses SSDs (high speed). <code>Standard</code>: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM). <code>Archive</code>: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity).

Table 127. spares-preview properties (continued)

Name	Type	Description
		Read Cache: The disk is an SSD providing high-speed read cache for a storage pool.
tier-numeric	uint32	Numeric equivalents for storage-tier values. 0: N/A 1: Performance 2: Standard 4: Archive 8: Read Cache
size	string	The size or capacity formatted with the current session base, precision, and units.
size-numeric	uint64	Unformatted size value.
rpm	uint32	Vendor-specified disk speed in thousands of revolutions per minute.
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. - 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-numeric	uint32	Numeric equivalents for sector-format values. 0: 512n 1: 512e 3: Mixed
pi-format	string	Not supported.
pi-format-numeric	uint32	Not supported.
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: UNKNOWN 1: Not FDE Capable 2: Not Secured 3: Secured, Unlocked 4: Secure, Locked 5: FDE Protocol Failure

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 128. 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. • <i>nnnnn</i>: The command failed.
component-id	string	Not used.
time-stamp	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> (UTC), when the command was issued.
time-stamp-numeric	uint32	Unformatted <code>time-stamp</code> value.

storage-preview

This basetype is used by `add storage` when the `preview` parameter is specified.

Table 129. storage-preview properties

Name	Type	Description
storage-type	string	The current storage type configuration. • Linear • Virtual
suggestions	string	Recommendations for how to improve storage system configuration.
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 130. support-assist properties

Name	Type	Description
license-state	string	Specifies whether a license has been input: • Not Yet Accepted • Accepted

Table 130. support-assist properties (continued)

Name	Type	Description
license-state-numeric	uint32	Numeric equivalents for license-state values. 0: Not Yet Accepted 1: Accepted
support-assist-state	string	The current state of SupportAssist: - Disabled - Running
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. - Update: This mode is enabled automatically during firmware updates.
support-assist-operation-mode-numeric	uint32	Numeric equivalents for support-assist-operation-mode values. 0: Maintenance 1: Normal 2: Update
auto-case	string	Specifies the auto-case creation status: - Disabled - Enabled
auto-case-numeric	uint32	Numeric equivalents for auto-case values. 0: Disabled 1: Enabled
apex-aiops-observability	string	Specifies the auto-case creation status: - Disabled - Enabled
apex-aiops-observability-numeric	uint32	Numeric equivalents for apex-aiops-observability values. 0: Disabled 1: Enabled
connection-preference	string	Indicates the user-specified connection preference: - Direct: The system connects directly to the SupportAssist server. - Gateway: Connections are made through a user-defined gateway.
connection-preference-numeric	uint32	Numeric equivalents for connection-preference values. 0: Direct 1: Gateway
gateway-endpoints	Embedded; see gateway-endpoints .	
proxy-information	Embedded; see proxy-information .	

support-assist-conn

This basetype is used by [check support-assist-connection](#).

Table 131. support-assist properties

Name	Type	Description
connection-state	string	The result of the connectivity test: • Undefined • Not Connected • Connected • Disabled
connection-state-numeric	uint32	Numeric equivalents for <code>connection-state</code> values. • 0: Undefined • 1: Not Connected • 2: Connected • 3: Disabled
endpoints-status	Embedded; see endpoints-status.	

support-assist-telemetry

This basetype is used by `show support-assist-telemetry-status`.

Table 132. support-assist-telemetry properties

Name	Type	Description
latest-upload-status	string	The status of the latest upload attempt. This value is blank if the service has not been configured or connected.
latest-upload-time	string	The date and time when the system last sent information to the SupportAssist server. This value is N/A if the service has not been configured or connected.
latest-upload-time-numeric	uint32	Unformatted version of <code>latest-upload-time</code> . This value is -1 if the service has not been configured or connected.

syslog-parameters

This basetype is used by `show syslog-parameters`.

Table 133. 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: • <code>crit</code>: Sends notifications for Critical events only. • <code>error</code> : Sends notifications for Error and Critical events. • <code>warn</code>: Sends notifications for Warning, Error, and Critical events. • <code>resolved</code>: Sends notifications for Resolved, Warning, Error, and Critical events. • <code>info</code> : Sends notifications for all events. • <code>none</code>: Disables syslog notification and clears the settings.
syslog-notification-level-numeric	string	Numeric equivalents for <code>syslog-notification-level</code> values. • 0: <code>info</code> • 1: <code>resolved</code> • 2: <code>warn</code> • 3: <code>error</code> • 4: <code>crit</code>

Table 133. syslog-parameters properties (continued)

Name	Type	Description
syslog-host-port	uint32	The port on which the remote syslog facility is expected to listen for notifications.
alert-notification	string	Shows whether the system will send SNMP notifications for alerts. - all: The system will send SNMP notifications for alerts. - none: The system will not send SNMP notifications for alerts.
alert-notification-numeric	uint32	Numeric equivalent for the alert-notification value. 5: none 6: all
persistent-alerts	string	Not supported.
persistent-alerts-numeric	uint32	Not supported.

system

This basetype is used by [show configuration](#) and [show system](#).

Table 134. 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.
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.
url	string	For internal use only.
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.

Table 134. system properties (continued)

Name	Type	Description
		• <code>Operational</code>: The partner Management Controller is responding normally. • <code>Not Operational</code>: The local Management Controller has established communication with the partner Management Controller, but the partner is not responding because it's not currently in active-active or failed-over state. • <code>Not Communicating</code>: The partner Management Controller is not ready to communicate. • <code>Unknown</code>: The operational status of the partner Management Controller cannot be determined.
other-MC-status- numeric	uint32	Numeric equivalents for <code>other-mc-status</code> values. • 1524: <code>Not Communicating</code> • 3231: <code>Not Operational</code> • 4749: <code>Operational</code> • 1496: <code>Unknown</code>
pfuStatus	string	Shows whether partner firmware update is running on the system, or is idle.
pfuStatus-numeric	uint32	Numeric equivalent for the <code>pfuStatus</code> value. • 0: <code>Idle</code> • 1: <code>Running</code>
supported-locales	string	Supported display languages.
current-node-wwn	string	Storage system node World Wide Name (WWNN).
fde-security-status	string	• <code>Unsecured</code> : The system has not been secured with a passphrase. • <code>Secured</code> : The system has been secured with a passphrase. • <code>Secured, Lock Ready</code> : The system has been secured and lock keys have been cleared. The system will become locked after the next power cycle. • <code>Secured, Locked</code> : The system is secured and the disks are locked to data access, preventing their use.
fde-security-status-numeric	uint32	Numeric equivalents for <code>fde-security-status</code> values. • 1: <code>Unsecured</code> • 2: <code>Secured</code> • 3: <code>Secured, Lock Ready</code> • 4: <code>Secured, Locked</code>
platform-type	string	Platform type.
platform-type-numeric	uint32	Numeric equivalent for the <code>platform-type</code> value.
platform-brand	string	Active platform brand of the Management Controller firmware.
platform-brand-numeric	uint32	Numeric equivalent for the <code>platform-brand</code> value.
redundancy-mode	Embedded; see redundancy .	
unhealthy-component	Embedded; see unhealthy-component .	

system-parameters-table

This basetype is used by [show system-parameters](#).

Table 135. 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. • <code>true</code>: Host profiles are enabled. • <code>false</code>: 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 <code>max-storage-pool-size</code> value in blocks.
max-capi-arrays	uint32	Same as <code>max-vdisks</code> .
max-chunk-size	uint32	Maximum chunk size for disk groups.
min-chunk-size	uint32	Minimum chunk size for disk groups.
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 disk-group 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.

Table 135. system-parameters-table properties (continued)

Name	Type	Description
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 the ip-address-mode value. • 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-spare	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.
performance-tuning-flags-numeric	uint32	For internal use only.
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.
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

Table 135. system-parameters-table properties (continued)

Name	Type	Description
		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-disk-groups-per-controller	uint32	The maximum number of ADAPT disk groups that each controller 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 136. tasks properties

Name	Type	Description
name	string	Task name.
type	string	Type of operation this task performs. - TakeSnapshot - ResetSnapshot - Replicate - EnableDSD - 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 - PlanCreateSnap - VerifySnap - InspectRetention - FindOldestSnap - UnmapSnap

Table 136. tasks properties (continued)

Name	Type	Description
		◦ 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 137. 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.
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 <code>total-data-transferred</code> value.
data-read	string	Amount of data read since the last sampling time.
data-read-numeric	uint64	Unformatted <code>data-read</code> value.
data-written	string	Amount of data written since the last sampling time.
data-written-numeric	uint64	Unformatted <code>data-written</code> 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 <code>total-bytes-per-second</code> 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 <code>read-bytes-per-second</code> value.
write-bytes-per-sec	string	Data transfer rate, in bytes per second, for write operations last sampling time.

Table 137. tier-hist-statistics properties (continued)

Name	Type	Description
write-bytes-per-sec-numeric	uint64	Unformatted <code>write-bytes-per-second</code> 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 <code>year-month-day hour:minutes:seconds</code> , when the data sample was taken.
sample-time-numeric	uint32	Unformatted <code>sample-time</code> value.

tiers

This basetype is used by [show pools](#) and [show tiers](#).

Table 138. 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 <code>tier</code> 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.

Table 138. tiers properties (continued)

Name	Type	Description
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 <code>raw-size</code> value in blocks.
total-size	string	The total capacity of the tier.
total-size-numeric	uint64	Unformatted <code>total-size</code> value in blocks.
allocated-size	string	The amount of space currently allocated to volumes in the tier.
allocated-size-numeric	uint64	Unformatted <code>allocated-size</code> value in blocks.
available-size	string	The available capacity in the tier.
available-size-numeric	uint64	Unformatted <code>available-size</code> value in blocks.
affinity-size	string	The total size of volumes configured to have affinity for that tier.
affinity-size-numeric	uint64	Unformatted <code>affinity-size</code> value in blocks.

tier-statistics

This basetype is used by [show tier-statistics](#) and [show pool-statistics](#).

Table 139. 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	• <code>Archive</code>: The lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • <code>Performance</code>: The highest storage tier, which uses SSDs (high speed). • <code>Read Cache</code>: The tier that provides read cache for a storage pool. • <code>Standard</code>: The tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).
tier-numeric	uint32	Numeric equivalents for <code>tier</code> 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 <code>UNMAP</code> 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 140. tier-summary properties

Name	Type	Description
serial-number	string	The serial number of the pool.
pool	string	The name of the pool.
tier	string	• <code>Archive</code>: The lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity). • <code>Performance</code>: The highest storage tier, which uses SSDs (high speed). • <code>Read Cache</code>: The tier that provides read cache for a storage pool. • <code>Standard</code>: The tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).
tier-numeric	uint32	Numeric equivalents for <code>tier</code> values. • 0: N/A • 1: Performance • 2: Standard • 4: Archive • 8: Read Cache
tier-hist-statistics	Embedded; see tier-hist-statistics .	
readcache-hist-statistics	Embedded; see readcache-hist-statistics .	

time-settings-table

This basetype is used by [show controller-date](#).

Table 141. time-settings-table properties

Name	Type	Description
date-time	string	Date and time, in the format <i>year-month-day hour:minutes:seconds</i> (UTC), reported by the controller being accessed.
date-time-numeric	uint32	Unformatted <code>date-time</code> 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. • <code>activated</code>: NTP is enabled. • <code>deactivated</code>: 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 142. unhealthy-component properties

Name	Type	Description
component-type	string	Component type.

Table 142. unhealthy-component properties (continued)

Name	Type	Description
component-type-numeric	uint32	Numeric equivalents for component-type values. • 0: super-cap (supercapacitor pack) • 1: MC (Management Controller) • 2: port (host port) • 3: controller (controller module) • 4: expansion module • 5: PSU (power supply unit) • 6: disk • 7: enclosure • 8: disk group • 9: fan • 10: memory card • 11: sensor • 12: disk slot • 13: network port • 14: SAS port • 15: virtual pool • 16: virtual disk group • 17: volume • 19: volume (source volume) • 20: snapshot • 21: host • 22: volume map • 23: system • 24: unknown • 25: sideplane • 26: fan module • 27: expander
component-id	string	Component identifier.
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 143. unused-disks-preview properties

Name	Type	Description
location	string	The disk location in the format <i>enclosure-numberdisk-number</i> .
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 the type values. • 4: SAS • 8: SSD SAS • 11: SAS MDL
tier	string	• N/A • 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). • 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.
tier-numeric	uint32	Numeric equivalents for tier values. • 0: N/A • 1: Performance • 2: Standard • 4: Archive • 8: Read Cache
size	string	The size or capacity formatted with the current session base, precision, and units.
size-numeric	uint64	Unformatted size value in blocks.
rpm	string	Vendor-specified disk speed in thousands of revolutions per minute.
sector-format	string	The sector format of disks in a disk group. • 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. • 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).
pi-formatted	string	Not supported.
pi-formatted-numeric	uint32	Not supported.
sector-format-numeric	uint32	Numeric equivalents for <code>sector-format</code> values. • 0: 512n • 1: 512e • 3: Mixed

Table 143. unused-disks-preview properties (continued)

Name	Type	Description
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: UNKNOWN • 1: Not FDE Capable • 2: Not Secured • 3: Secured, Unlocked • 4: Secured, Locked • 5: FDE Protocol Failure

unwritable-cache

This basetype is used by `show unwritable-cache`.

Table 144. 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.

update-status-process-step

This basetype is used by `show firmware-update-status`.

Table 145. update-status-process-step properties

Name	Type	Description
process-step	string	Current step in the firmware update process.
process-step-numeric	uint32	Numeric equivalent for the process-step value. • 0: N/A • 1: Check Bundle Integrity • 2: Health Check • 3: Transfer to Partner • 4: Partner Prep Codeload • 5: Partner reboot • 6: Partner update controller • 7: Partner update expander • 8: Partner update CPLD • 9: Local update controller • 10: Local update expander • 11: Local update CPLD • 12: Local reboot

Table 145. update-status-process-step properties (continued)

Name	Type	Description
		• 13: Cleanup • 14: Upload • 15: GetMCLocalLogs
status	string	Status of the process step.
status-numeric	uint32	Numeric equivalent for the <code>status</code> value. • 0: Pending • 1: OK • 2: In-Progress • 3: Error • 4: N/A
message	string	Message describing the status of the process step.
message-numeric	uint32	Numeric equivalent for the <code>process-step</code> value. • 0: Pending • 1: Success • 2: In-Progress • 3: Error • 4: N/A

update-status-summary

This basetype is used by [show firmware-update-status](#).

Table 146. update-status-summary properties

Name	Type	Description
controller-id	string	• A: Controller A. • B: Controller B.
controller-id-numeric	uint32	Numeric equivalent for the <code>controller-id</code> value. • 0: B • 1: A
activity	string	Type of update activity.
activity-numeric	uint32	Numeric equivalent for the <code>activity</code> value. • 0: N/A • 1: System update • 2: Controller update • 3: Partner firmware update • 4: Firmware upload
start-time	string	Time when the update started.
completion-time	string	Time when the update completed.
estimated-time-to-completion	string	Estimated time to complete an in-progress update.
percentage-completed	string	Percentage complete of an in-progress update.
completion-status	string	Activity status.
completion-status-numeric	uint32	Numeric equivalent for the <code>completion-status</code> value. • 0: Success • 1: In-Progress

Table 146. update-status-summary properties (continued)

Name	Type	Description
		2: Fail
bundle-version	string	Firmware bundle version.
update-status-process-step	Embedded;	see update-status-process-step .

usergroups

This basetype is used by [show user-groups](#).

Table 147. usergroups properties

Name	Type	Description
usergroupname	string	The user group name.
roles	string	- monitor: User group can view but not change system settings. - standard: User can view and change system settings except: configuring local users; configuring LDAP; performing write operations through FTP or SFTP; performing file uploads from the PowerVault Manager; using the <code>restore defaults</code> command. - manage: User group can view and change system settings. - diagnostic: User group can view and change system settings.
usergroup-type	string	The user group type: LDAP.
usergroup-locale	string	Not supported.
interface-access-WBI	string	- x: User group can access the PowerVault Manager web-browser interface. (blank): User group cannot access this interface.
interface-access-CLI	string	- x: User group can access the command-line interface. (blank): User group cannot access this interface.
interface-access-FTP	string	- x: User group can access the SFTP interface. (blank): User group cannot access this interface.
interface-access-SMIS	string	Not supported.
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 <code>storage-space</code> 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: Temperatures are shown in degrees Celsius. - Fahrenheit: Temperatures are shown in degrees Fahrenheit.

Table 147. usergroups properties (continued)

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).

users

This basetype is used by `show users`.

Table 148. users properties

Name	Type	Description
username	string	User name.
roles	string	• <code>monitor</code>: User group can view but not change system settings. • <code>manage</code>: User group can view and change system settings. • <code>standard</code>: User can view and change system settings except: configuring local users; configuring LDAP; performing write operations through FTP or SFTP; performing file uploads from the PowerVault Manager; using the <code>restore defaults</code> command. • <code>diagnostic</code>: User group can view and change system settings.
user-type	string	The experience level of the user: <code>Novice</code> , <code>Standard</code> , <code>Advanced</code> , or <code>Diagnostic</code> . This parameter does not affect access to commands.
user-type-numeric	string	Numeric equivalents for <code>user-type</code> values. • <code>1</code>: <code>Novice</code> • <code>2</code>: <code>Standard</code> • <code>3</code>: <code>Advanced</code> • <code>4</code>: <code>Diagnostic</code>
user-locale	string	The display language.
user-locale-numeric	string	Numeric equivalents for <code>user-locale</code> values • <code>0</code>: <code>English</code> • <code>3</code>: <code>Spanish</code> • <code>4</code>: <code>French</code> • <code>5</code>: <code>German</code> • <code>7</code>: <code>Japanese</code> • <code>8</code>: <code>Korean</code> • <code>11</code>: <code>Chinese-simplified</code>
interface-access-WBI	string	• <code>x</code>: User group can access the PowerVault Manager web-browser interface. • (blank): User group cannot access this interface.
interface-access-CLI	string	• <code>x</code>: User group can access the command-line interface. • (blank): User group cannot access this interface.
interface-access-FTP	string	• <code>x</code>: User group can access the FTP interface. • (blank): User group cannot access this interface.
interface-access-SMIS	string	• (blank): User group cannot access this interface.
interface-access-SNMP	string	• <code>U</code>: The user group can access the SNMPv3 interface and view the MIB. • (blank): User cannot access this interface.
storage-size-base	uint8	The base for entry and display of storage-space sizes: • <code>2</code>: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude.

Table 148. users properties (continued)

Name	Type	Description
		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 <code>storage-space</code> 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.
storage-size-units-numeric	string	Numeric equivalent for the <code>storage-size-units</code> value. 0: Auto 1: MB 2: GB 3: TB
temperature-scale	string	- Celsius: Temperatures are shown in degrees Celsius. - Fahrenheit: Temperatures are shown in degrees Fahrenheit.
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. - 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 <code>default-password-changed</code> values. 0: False 1: True
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 <code>interface-access-SNMP</code> property is set to <code>snmptarget</code> , this specifies the IP address of the host that will receive SNMP traps.
trap-port	string	The SNMP trap destination port of the host for an SNMPv3 user that can receive trap notifications.

versions

This basetype is used by [show configuration](#) and [show versions](#).

Table 149. 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.
bundle-status	string	Firmware bundle status.
bundle-status-numeric	uint32	Numeric equivalent for the bundle-status value.
bundle-version-only	string	Firmware bundle version only.
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.
sc-fu-version	string	Storage Controller ASIC Controller 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.
pm-cpld-version	string	Not supported.
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 Version: No CTK version has been applied to this system.
mcos-version	string	Management Controller operating system version.
gem-version	string	Expander Controller GEM firmware package version.
pubs-version	string	CLI help version.

Table 149. versions properties (continued)

Name	Type	Description
translation-version	string	CLI help translation version.

volume-groups

This basetype is used by [show volume-groups](#).

Table 150. volume-groups

Name	Type	Description
durable-id	string	Volume group ID.
group-name	string	The name of the volume group in the format <code>volume-group.*</code> , where <code>*</code> represents all volumes in the group.
serial-number	string	The serial number of the volume group.
type	string	The group type, which is <code>Volume</code> .
type-numeric	uint32	Numeric equivalents for <code>type</code> 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-names

This basetype is used by [show volume-names](#).

Table 151. volume-names properties

Name	Type	Description
volume-name	string	Volume name.
serial-number	string	Volume serial number.
volume	string	For internal use only.

volume-reservations

This basetype is used by [show volume-reservations](#).

Table 152. 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 <code>reservation-active</code> values. 0: Free 1: Reserved
pgr-generation	uint32	The generation of the volume reservation, shown as a hexadecimal value.

Table 152. volume-reservations (continued)

Name	Type	Description
host-id	string	- For an FC initiator, its WWPN. - 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 <code>reserve-scope</code> 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 <code>reserve-type</code> 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

volume-statistics

This basetype is used by `show volume-statistics`.

Table 153. 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 <code>bytes-per-second</code> 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 153. volume-statistics properties (continued)

Name	Type	Description
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 <code>data-read</code> 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 <code>data-written</code> 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.
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.
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 <code>year-month-day:minutes:seconds,seconds></code> , when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	uint32	Unformatted <code>reset-time</code> value.
start-sample-time	string	The date and time, in the format <code>year-month-day:minutes:seconds,seconds></code> , when sampling started for the <code>iops</code> and <code>bytes-per-second</code> values.
start-sample-time-numeric	uint32	Unformatted <code>start-sample-time</code> value.
stop-sample-time	string	The date and time, in the format <code>year-month-day:minutes:seconds,seconds></code> , when sampling stopped for the <code>iops</code> and <code>bytes-per-second</code> values.

Table 153. volume-statistics properties (continued)

Name	Type	Description
stop-sample-time-numeric	uint32	Unformatted <code>stop-sample-time</code> value.

volume-view

This basetype is used by [show maps](#).

Table 154. volume-view properties

Name	Type	Description
durable-id	string	Volume ID in the format <code>v<#></code> , where <code><#></code> 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	For internal use only.
volume-serial	string	The serial number of the volume.
volume-name	string	Volume name.
volumes-url	string	For internal use only.
volume-view-mappings	Embedded; see volume-view-mappings .	

volume-view-mappings

This basetype is used by [show maps](#).

Table 155. 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.
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 <code>no-access</code>
lun	string	- The LUN that identifies the volume to a host. - Blank if not mapped or mapped as <code>no-access</code>.
access	string	Type of host access to the volume. <code>read-write</code>: Read and write. <code>read-only</code>: Read only. <code>no-access</code>: No access (masked). <code>not-mapped</code>: Not mapped.
access-numeric	uint32	Numeric equivalents of <code>access</code> values. <code>0</code>: <code>not-mapped</code> <code>1</code>: <code>no-access</code> <code>2</code>: <code>read-only</code> <code>3</code>: <code>read-write</code>
identifier	string	- For a SAS initiator, its WWPN. - For an FC initiator, its WWPN. - For an iSCSI initiator, its node name (typically the IQN).

Table 155. volume-view-mappings properties (continued)

Name	Type	Description
initiators-url	string	For internal use only.
nickname	string	- For a host, its name in the format <code>host-name.*</code>, where the <code>*</code> represents all initiators in the host. - For a host group, its name in the format <code>host-group.*.*</code>, where the first <code>*</code> represents all hosts in the host group and the second <code>*</code> represents all initiators in those hosts. - Blank if not set or for all other initiators.
host-profile	string	<code>Standard</code>: Default profile. <code>HP-UX</code>: The host uses Flat Space Addressing. <code>OpenVMS</code>: The host does not allow LUN 0 to be assigned to a mapping.
host-profile-numeric	uint32	Numeric equivalents of <code>host-profile</code> values. 0: Standard 2: OpenVMS 1: HP-UX

volumes

This basetype is used by [show volumes](#) and [show volume-groups](#).

Table 156. volumes properties

Name	Type	Description
durable-id	string	Volume ID in the format <code>V <#></code> , where <code><#></code> 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	For internal use only.
virtual-disk-name	string	The name of the pool that contains the volume.
storage-pool-name	string	The name of the pool that contains the volume.
storage-pools-url	string	Pool URL.
volume-name	string	Volume name.
size	string	Volume capacity, formatted to use the current base, precision, and units.
size-numeric	uint64	Unformatted <code>size</code> value in blocks.
total-size	string	The total size of the volume.
total-size-numeric	uint64	Unformatted <code>total-size</code> 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 <code>allocated-size</code> value in blocks.
storage-type	string	<code>Linear</code>: The volume is in a linear pool. <code>Virtual</code>: The volume is in a virtual pool.
storage-type-numeric	uint32	Numeric equivalents for <code>storage-type</code> values. 0: Linear 1: Virtual
preferred-owner	string	Controller that owns the volume during normal operation. - A: Controller A. - B: Controller B.

Table 156. volumes properties (continued)

Name	Type	Description
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. - atomic-write: This mode guarantees that if a failure (such as I/O being aborted or a controller failure) interrupts a data transfer between a host and the storage system, controller cache will contain either all the old data or all the new data, not a mix of old and new data. This option has a slight performance cost because it maintains a secondary copy of data in cache so that if a data transfer is not completed, the old cache data can be restored.
cache-optimization-numeric	uint32	Numeric equivalents for cache-optimization values. 0: standard 3: atomic-write
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

Table 156. volumes properties (continued)

Name	Type	Description
		• 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.
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.
volume-qualifier-numeric	uint32	Numeric equivalent for the volume-qualifier value.

Table 156. volumes properties (continued)

Name	Type	Description
		0: N/A
blocksize	uint32	The size of a block, in bytes.
blocks	uint64	The number of blocks, whose size is specified by the <code>blocksize</code> property.
capabilities	string	For internal use only.
volume-parent	string	Parent volume serial number. For example, the serial number of a snapshot's master volume.
snap-pool	string	Not applicable.
replication-set	string	Not applicable.
attributes	string	Shows whether the volume's disks are single pathed.
virtual-disk-serial	string	Disk group serial number.
creation-date-time	string	The date and time, in the format <code>year-month-dayhour:minutes:seconds(UTC)</code> , when the volume was created.
creation-date-time-numeric	uint32	Unformatted <code>creation-date-time</code> value.
volume-description	string	- For HP-UX, a text value (set in-band by a host application) that identifies the volume. - For OpenVMS, a numeric value (set with the <code>create volume</code> or <code>set volume</code> command) that identifies the volume to an OpenVMS host. - Blank by default.
wwn	string	World Wide Name of the volume.
progress	string	For a volume-copy operation, the percent complete (0%-99%).
progress-numeric	uint32	Unformatted <code>progress</code> value.
container-name	string	Name of the pool that contains the volume.
container-serial	string	Serial number of the pool that contains the volume.
allowed-storage-tiers	string	Not supported.
allowed-storage-tiers-numeric	uint32	Not supported.
threshold-percent-of-pool	string	For internal use only.
reserved-size-in-pages	uint32	For internal use only.
allocate-reserved-pages-first	string	For internal use only.
allocate-reserved-pages-first-numeric	uint32	For internal use only.
zero-init-page-on-allocation	string	For internal use only.
zero-init-page-on-allocation-numeric	uint32	For internal use only.
large-virtual-extents	string	Shows whether the system will try to allocate pages in a sequentially optimized way to reduce I/O latency and improve performance.
large-virtual-extents-numeric	uint32	0: Disabled 1: Enabled
raidtype	string	The RAID level of the disk group. - NRAID - RAID0 - RAID1 - RAID5

Table 156. volumes properties (continued)

Name	Type	Description
		- RAID6 - RAID10 - ADAPT
raidtype-numeric	uint32	Numeric equivalents for <code>raidtype</code> values. 0: RAID0 1: RAID1 2: ADAPT 5: RAID5 6: NRAID 10: RAID10 11: RAID6
pi-format	string	Disabled.
pi-format-numeric	uint32	Disabled.
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 <code>cs-copy-dest</code> values. 0: Off 1: On
cs-copy-src	string	- Off: Not applicable. - On: The volume is the source for a volume copy operation.
cs-copy-src-numeric	uint32	Numeric equivalents for <code>cs-copy-src</code> 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 <code>cs-primary</code> 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 <code>cs-secondary</code> values. 0: Off 1: On
metadata-in-use	string	Amount of pool metadata currently being used by the volume.
metadata-in-use-numeric	uint64	Unformatted metadata-in-use value in blocks.
health	string	Numeric equivalents for <code>health</code> values. OK
health-numeric	uint32	Numeric equivalents for <code>health</code> values.

Table 156. volumes properties (continued)

Name	Type	Description
		0: OK
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 .

workload

This basetype is used by [show workload](#).

Table 157. workload properties

Name	Type	Description
current-ssd-space	string	Current SSD capacity allocated to the pool.
current-ssd-space-numeric	uint64	Numeric equivalent for the <code>current-ssd-space</code> value.
pool	string	The pool for which the calculations are based: A or B.
calc-type	string	Either Peak or Average.
io-type	string	Shows whether calculations are based on either Reads, Writes, or the Combined total of reads and writes.
pct-target-a	string	Low target percentage of capacity.
pct-target-a-numeric	uint32	Numeric equivalent for the <code>pct-target-a</code> value.
pct-target-b	string	Medium target percentage of capacity.
pct-target-b-numeric	uint32	Numeric equivalent for the <code>pct-target-b</code> value.
pct-target-c	string	High target percentage of capacity.
pct-target-c-numeric	uint32	Numeric equivalent for the <code>pct-target-c</code> value.
heatmaps	Embed; see heatmaps .	

Settings changed by restore defaults

This appendix summarizes the system settings that result from using the `restore defaults` command.

Table 158. 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 - Debug - Ciphers setting	Settings: - Disabled - Enabled - Enabled - Disabled - Enabled - Disabled - Disabled - Enabled - Disabled - Default cipher strings
Users	All configured users are deleted and replaced with default user definitions and default settings: User: <code>setup</code> ; Password: press Enter
CLI session timeout	Preserved
Tasks and schedules	Preserved
Time/date and NTP settings	Preserved
Network IP settings	Preserved
IPv6 network settings	Preserved
DNS management hostname	Preserved
DNS name servers	Preserved
DNS search domains	Preserved
SNMP settings: - SNMP trap notification level - SNMP trap host IPs - SNMP read community - SNMP write community	Settings: - none 0.0.0.0 - public - private
SMTP settings: - Email notification - Email notify filter - Email addresses	Settings: - Disabled - none - none - none

Table 158. Settings changed by restore defaults (continued)

Setting	Value
- Email server - Email domain - Email sender - Log destination - Include logs - Alert notification - Proxy setting	- none - none - none - Disabled - All - Cleared
LDAP - LDAP parameters - LDAP settings - User groups - Audit log	Settings: - Cleared - Disabled (server IP defaulted to 0.0.0.0) - Preserved - Preserved
Syslog - Sylog parameters - Syslog settings	Settings: - Cleared - Disabled (host IP defaulted to 0.0.0.0)
Alert condition history	Preserved
Alerts	Preserved
SSL/SSH certificates	preserved
Disk group metadata	preserved
Host port settings: - FC link speed - FC topology	Settings: - Auto - Point-to-point
Host names and profiles	(preserved)
Disk 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 - Missing LUN response - Controller failure - Supercap 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	Settings: - Enabled 360 hours - Enabled - High - Enabled - Enabled 5 seconds - Immediate - Disabled - Not Ready - Disabled - Enabled - Disabled - Disabled - Disabled - Disabled - Disabled - Enabled - Disabled 15 minutes - Disabled - Disabled - Disabled

Table 158. Settings changed by restore defaults (continued)

Setting	Value
• Auto stall recovery • Restart on CAPI fail	• Enabled (for failover/failback, not I/O) • Enabled
FDE settings	preserved
Replication sets • Peer connections • Replication sets • CHAP records	Settings: • Preserved • Preserved • Preserved
Enclosure settings: • Name • Location • Rack number • Rack position	Settings: • cleared • cleared • 0 • 0
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
Host and initiator nicknames and profiles	preserved
Host groups	preserved
Host port mode	preserved
Volume identifying information	preserved
Volume groups	preserved
Pool settings: • Thresholds • Overcommit • Limits and policy • Snapshot space thresholds	Settings: • preserved • preserved • preserved • preserved
CLI parameters	CLI parameters are kept on a per-user basis. All configured users are deleted and replaced with default user definitions and default settings as detailed in the Users section of this table.
Debug log parameters	Each parameter is reset to its default as documented for the <code>set debug-log-parameters</code> CLI command.
Volume snapshot retention priority	preserved
Volume cache settings	Preserved
Expander PHY settings	Controller module root expander PHY settings are cleared
Volume tier affinity	preserved
Device identification LED status	preserved