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).

**Topics:**
- Accessing the CLI
- CLI output formats
- Using CLI interactively
- Using a script to access the CLI
- Command syntax
- Command completion, editing, and history
- Size representations
- Event log

**Accessing the CLI**

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

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

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

**CLI output formats**

The CLI has two output formats:

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

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

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

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

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

**Using CLI interactively**

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

**NOTE:** In the interactive mode, confirmation is required for commands that can cause data unavailability or data loss.
The following example shows interactively starting an SSH session, logging into the CLI, running a command, and exiting the CLI:

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

Product name
System Name: Name
System Location: Location
Version: firmware version
# show controller-date
Controller Date: 2019-09-30 11:05:12
Time Zone Offset: -07:00
Success: Command completed successfully. (2019-09-30 11:05:12)
# exit
```

### Using a script to access the CLI

Because basic command-line semantics provide prompts for user input and response time is indeterminate, scripts would need to use an “expect”-type mechanism to scan output for prompts. It is strongly recommended and more efficient to use the HTTP interface to access the API.

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. For the certificate to be validated, download it through a browser and then set the following environment variable to point to the certificate:

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

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

# Generate the login hash used to authenticate the user.
# The user name and password must be joined with an underscore.
my $digest_data = "<user name>_<password>";
my $digest_hash = sha256_hex( $digest_data );

# Create a user agent for sending https requests and generate a request object.
$user_agent = LWP::UserAgent->new( );
$url = 'https://IP-address/api/login/' . $digest_hash;
$request = HTTP::Request->new( GET => $url );

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

# Once the script has logged in, the response returns back a session key.
# This code shows how to retrieve that session key.
my $parser = XML::LibXML->new();
my $document = $parser->parse_string( $response->content );

my $root = $document->getDocumentElement;
my @objects = $root->getElementsByTagName( 'OBJECT' );
my @properties = @objects[0]->getElementsByTagName( 'PROPERTY' );
my $sessionKey;
foreach my $property ( @properties ) {
    my $name = $property->getAttribute( 'name' );
    if( $name eq 'response' ) {
        $sessionKey = $property->textContent;
    }
}
```
The following example shows how to construct a Python script to communicate with the JSON API using HTTPS.

```python
import sys
import requests
import json
import hashlib

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

url = "https://IP-address"
auth_string = hashlib.sha256('\'user name\'<\password\').hexdigest()

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

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

The following code segment shows how to get the entire configuration information from the CLI and print the output using the `ipa` option for XML output. The output can easily be redirected to a file for archiving.

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

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

### Using XML API output

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

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

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

**Table 1. XML API elements**

<table>
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<tr>
<th>Element</th>
<th>Description and attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESPONSE</td>
<td>The RESPONSE element is the top-level element, which contains all data output for the CLI command that was issued. The response includes:</td>
</tr>
<tr>
<td></td>
<td>- A number of OBJECT elements, which varies by command.</td>
</tr>
<tr>
<td></td>
<td>- 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.</td>
</tr>
<tr>
<td></td>
<td>There is only one RESPONSE element per issued command.</td>
</tr>
<tr>
<td>OBJECT</td>
<td>In general, an OBJECT element describes a storage-system component such as a disk or a volume. An object has these attributes:</td>
</tr>
<tr>
<td>Element</td>
<td>Description and attributes</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>• 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.).</td>
</tr>
<tr>
<td></td>
<td>• name: The name of the object.</td>
</tr>
<tr>
<td></td>
<td>• oid: The unique identifier for the object in the scope of the response.</td>
</tr>
<tr>
<td></td>
<td>The OBJECT element can contain PROPERTY elements.</td>
</tr>
<tr>
<td>PROPERTY</td>
<td>A PROPERTY element provides detail about the attributes of an OBJECT. A property has these attributes:</td>
</tr>
<tr>
<td></td>
<td>• name: The unique name for the property within the object.</td>
</tr>
<tr>
<td></td>
<td>• key: Indicates whether this property is a key value to identify this object.</td>
</tr>
<tr>
<td></td>
<td>• type: The type of data represented by the element data.</td>
</tr>
<tr>
<td></td>
<td>• size: Typically the maximum size of the output. Usually only important if the console output is displayed in rows.</td>
</tr>
<tr>
<td></td>
<td>• draw: Whether to show or hide this data in console format.</td>
</tr>
<tr>
<td></td>
<td>• sort: The type of sorting that can be applied to this property.</td>
</tr>
<tr>
<td></td>
<td>• display-name: The label for this data to show in user interfaces.</td>
</tr>
<tr>
<td>COMP</td>
<td>A COMP (composition) element associates nested objects, such as a task object within a schedule object. A composition element has these attributes:</td>
</tr>
<tr>
<td></td>
<td>• P: The oid of the part component.</td>
</tr>
<tr>
<td></td>
<td>• G: The oid of the group component.</td>
</tr>
<tr>
<td></td>
<td>An alternative to using COMP elements is described in XML API optimization.</td>
</tr>
<tr>
<td>ASC</td>
<td>The association element provides a simple association description between two objects in the response.</td>
</tr>
<tr>
<td></td>
<td>• A: First object.</td>
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<tr>
<td></td>
<td>• B: Second object.</td>
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**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 and 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:

```json
{
  "versions": [
    {
      "object-name": "controller-a-versions",
      "sc-cpu-type": "SC-CPU-type",
      "bundle-version": "bundle-version",
      "bundle-base-version": "bundle-base-version",
      "build-date": "Mon Jul 17 14:15:44 MDT 2017",
      ...
    },
    {
      "object-name": "controller-b-versions",
      ...
    }
  ],
  "status": [
    {
      "object-name": "status",
      "response-type": "Success",
      "response-type-numeric": 0,
    }...
  ]
}
```
Other basetypes may use the durable ID to uniquely identify the objects.

**Scripting guidelines**

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

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

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

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

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

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

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

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

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

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

**Example command input and API output**

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

- **Command-line interface format:** `create user JSmith interfaces wbi password Abc#1379`
- **HTTPS interface format:** `create/user/JSmith/interfaces/wbi/password/Abc#1379`
XML API 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">
  <OBJECT basetype="port" name="ports" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">hostport_A0</PROPERTY>
    <PROPERTY name="controller" key="true" type="string">A</PROPERTY>
    <PROPERTY name="controller-numeric" key="true" type="string">1</PROPERTY>
    <PROPERTY name="port" key="true" type="string">A0</PROPERTY>
    <PROPERTY name="port-type" type="string">FC</PROPERTY>
    ...
  </OBJECT>
</RESPONSE>
```
For the JSON API, embedding objects is the only way to show relationships and brief mode is not applicable.

**Command syntax**

**General rules for specifying commands**

Command names and parameter names are not case sensitive.

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

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

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

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

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

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

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

**Specifying drawers**

In an enclosure with drawers:

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

**Specifying disks**

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

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

**Specifying disk groups**

You can specify:

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

Specifying pools
For virtual storage, you can specify:
• A pool by its name or serial number.
• A list of pool names or serial numbers separated by commas (with no spaces). Not all commands support lists. Example: A, B

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

Specifying volume groups
For virtual storage, you can specify:
• A volume group by its name in the format volume-group.*, where * represents all volumes in the group. Example: TestVolumes.*

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

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

Port IDs increment from 0 in each controller module.

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

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

Specifying host groups
For virtual storage, you can specify:
• A host group by name in the format host-group.*.*, where the first * represents all hosts in the group and the second * represents all initiators in those hosts. Example: TestLab.*.*
Specifying fan modules

In a 5U84 enclosure:

- Fan modules are specified by enclosure ID and module number. Enclosure IDs increment from 0. Module IDs increment from 0 in each enclosure. Example: 1.1

User password rules

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

Command completion, editing, and history

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

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

<table>
<thead>
<tr>
<th>Action</th>
<th>Press</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete a partially entered keyword</td>
<td>Tab or Ctrl+i</td>
</tr>
<tr>
<td>Show command history</td>
<td>F6</td>
</tr>
<tr>
<td>Get previous command from history</td>
<td>Up Arrow</td>
</tr>
<tr>
<td>Get next command from history</td>
<td>Down Arrow</td>
</tr>
<tr>
<td>Move cursor left</td>
<td>Left Arrow</td>
</tr>
<tr>
<td>Move cursor right</td>
<td>Right Arrow</td>
</tr>
<tr>
<td>Delete previous character</td>
<td>Backspace</td>
</tr>
</tbody>
</table>

Size representations

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

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

Table 3. Size representations in base 2 and base 10

<table>
<thead>
<tr>
<th>Base 2</th>
<th>Size in bytes</th>
<th>Base 10</th>
<th>Size in bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td></td>
<td>Unit</td>
<td></td>
</tr>
<tr>
<td>KiB (kibibyte)</td>
<td>1,024</td>
<td>KB (kilobyte)</td>
<td>1,000</td>
</tr>
<tr>
<td>MiB (mebibyte)</td>
<td>1,024</td>
<td>MB (megabyte)</td>
<td>1,000</td>
</tr>
<tr>
<td>GiB (gibibyte)</td>
<td>1,024</td>
<td>GB (gigabyte)</td>
<td>1,000</td>
</tr>
</tbody>
</table>
### 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.
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**

<table>
<thead>
<tr>
<th>Category</th>
<th>Commands</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLI and users</td>
<td>create user, delete user, exit, help, set cli-parameters, set password, set prompt, set user, show cli-parameters, show sessions, show users</td>
</tr>
<tr>
<td>Disks, disk groups, pools, tiers, and spares</td>
<td>abort scrub, abort verify, add disk-group, add spares, add storage, clear disk-metadata, clear fde-keys, clear fenced-data, create vdisk, delete pools, delete vdisks, dequarantine, expand vdisk, remove spares, rescan, scrub disk-groups, scrub vdisk, set disk, set disk-group, set expander-fault-isolation, set fde-import-key, set fde-lock-key, set fde-state, set led, set pool, set vdisk, show disk-groups, show disks, show fde-state, show pools, show tiers, show vdisks, trust, verify disk-groups, verify vdisk</td>
</tr>
<tr>
<td>Volumes, volume groups, initiators, hosts, host groups, and mapping</td>
<td>add host-group-members, add host-members, add volume-group-members, create host, create host-group, create volume, create volume-group, create volume-set, delete host-groups, delete hosts, delete initiator-name, delete volume-groups, delete volumes, expand disk-group, expand volume, expand volume, map volume, release volume, remove disk-groups, remove host-group-members, remove host-members, remove volume-group-members, scrub volume, set host, set host-group, set host-port-mode, set initiator, set volume, set volume-group, show cache-parameters, show host-groups, show initiators, show maps, show ports, show unrewritable-cache, show volume-groups, show volume-names, show volume-reservations, show volumes, unmap volume</td>
</tr>
<tr>
<td>Snapshots</td>
<td>create snapshots, delete all-snapshots, delete snapshot, reset snapshot, rollback volume, set snapshot-space, show snapshot-space, show snapshots</td>
</tr>
<tr>
<td>Virtual volume copy</td>
<td>abort copy, copy volume, show volume-copies</td>
</tr>
<tr>
<td>Scheduled tasks</td>
<td>create schedule, create task, delete schedule, delete task, set schedule, set task, show schedules, show tasks</td>
</tr>
<tr>
<td>Event notification</td>
<td>set email-parameters, set snmp-parameters, set syslog-parameters, show email-parameters, show events, show snmp-parameters, show syslog-parameters, test</td>
</tr>
<tr>
<td>System configuration and utilities</td>
<td>check firmware-upgrade-health, clear cache, clear dns-parameters, create certificate, create chap-record, delete chap-records, ping, 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-parameters, set enclosure, set expander-fault-isolation, set expander-phy, set host-parameters, set host-port-mode, set iscsi-parameters, set led, set network-parameters, set ntp-parameters, set protocols, set system, set volume-cache-parameters, show advanced-settings, show cache-parameters, show certificate, show chap-records, show configuration, show controller-date, show controllers, show disk-parameters, show dns-parameters, show enclosures, show expander-status, show fan-modules, show fans, show fenced-data, show frus, show inquiry, show iscsi-parameters, show license, show network-parameters, show ntp-status, show ports, 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, shutdown, verify links</td>
</tr>
<tr>
<td>Service utilities</td>
<td>clear events, clear expander-status, fail, reset smis-configuration, restore defaults, set debug-log-parameters, set expander-fault-isolation, set expander-phy, show debug-log-parameters, show service-tag-info, unfail controller</td>
</tr>
<tr>
<td>API specific</td>
<td>meta, show refresh-counters</td>
</tr>
<tr>
<td>Remote systems</td>
<td>delete remote-system, show remote-systems</td>
</tr>
<tr>
<td>Category</td>
<td>Commands</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Peer connections</td>
<td>create peer-connection, delete peer-connection, query peer-connection, set peer-connection, show peer-connection</td>
</tr>
<tr>
<td>Virtual volume replication</td>
<td>abort replication, clear replication-queue, create replication-set, delete replication-set, replicate, resume replication-set, set replication-set, show replication-sets, show replication-snapshot-history suspend replication-set</td>
</tr>
<tr>
<td>IPv6</td>
<td>add ipv6-address, remove ipv6-address, set ipv6-network-parameters, show ipv6-addresses, show ipv6-network-parameters</td>
</tr>
<tr>
<td>SupportAssist and CloudIQ</td>
<td>check support-assist, clear support-assist-proxy, send support-assist-logs, set cloudiq, set support-assist, set support-assist-info, set support-assist-proxy, show cloudiq, show support-assist</td>
</tr>
</tbody>
</table>
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:

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

Topics:
- abort copy
- abort replication
- abort scrub
- abort verify
- add disk-group
- add host-group-members
- add host-members
- add ipv6-address
- add spares
- add storage
- add volume-group-members
- check firmware-upgrade-health
- check support-assist
- clear cache
- clear disk-metadata
- clear dns-parameters
- clear events
- clear expander-status
- clear fde-keys
- clear fenced-data
- clear replication-queue
- clear support-assist-proxy
- copy volume
- create certificate
- create chap-record
- create host
- create host-group
- create peer-connection
- create replication-set
- create schedule
- create snapshots
- create task
- create user
- create vdisk
• create volume
• create volume-group
• create volume-set
• delete all-snapshots
• delete chap-records
• delete host-groups
• delete hosts
• delete initiator-nickname
• delete peer-connection
• delete pools
• delete remote-system
• delete replication-set
• delete schedule
• delete snapshot
• delete task
• delete user
• delete vdisks
• delete volume-groups
• delete volumes
• dequarantine
• exit
• expand disk-group
• expand vdisk
• expand volume
• fail
• help
• map volume
• meta
• ping
• query peer-connection
• release volume
• remove disk-groups
• remove host-group-members
• remove host-members
• remove ipv6-address
• remove spares
• remove volume-group-members
• replicate
• rescan
• reset all-statistics
• reset controller-statistics
• reset disk-error-statistics
• reset disk-group-statistics
• reset disk-statistics
• reset dns-management-hostname
• reset host-link
• reset host-port-statistics
• reset pool-statistics
• reset smis-configuration
• reset snapshot
• reset vdisk-statistics
• reset volume-statistics
• restart mc
• restart sc
• restore defaults
• resume replication-set
• rollback volume
• scrub disk-groups
• scrub vdisk
• scrub volume
• send support-assist-logs
• set advanced-settings
• set chap-record
• set cli-parameters
• set cloudiq
• set controller-date
• set debug-log-parameters
• set disk
• set disk-group
• set disk-parameters
• set dns-management-hostname
• set dns-parameters
• set email-parameters
• set enclosure
• set expander-fault-isolation
• set expander-phy
• set fde-import-key
• set fde-lock-key
• set fde-state
• set host
• set host-group
• set host-parameters
• set host-port-mode
• set initiator
• set ipv6-network-parameters
• set iscsi-parameters
• set led
• set network-parameters
• set ntp-parameters
• set password
• set peer-connection
• set pool
• set prompt
• set protocols
• set replication-set
• set schedule
• set snapshot-space
• set snmp-parameters
• set support-assist
• set support-assist-info
• set support-assist-proxy
• set syslog-parameters
• set system
• set task
• set user
• set vdisk
• set volume
• set volume-cache-parameters
• set volume-group
• show advanced-settings
• show cache-parameters
• show certificate
• show chap-records
• show cli-parameters
• show cloudiq
• show configuration
• show controller-date
• show controllers
• show controller-statistics
• show debug-log-parameters
• show disk-groups
• show disk-group-statistics
• show disk-parameters
• show disks
• show disk-statistics
• show dns-management-hostname
• show dns-parameters
• show email-parameters
• show enclosures
• show events
• show expander-status
• show fan-modules
• show fans
• show fde-state
• show fenced-data
• show frus
• show host-groups
• show host-phy-statistics
• show host-port statistics
• show initiators
• show inquiry
• show ipv6-addresses
• show ipv6-network-parameters
• show iscsi-parameters
• show license
• show maps
• show network-parameters
• show ntp-status
• show peer-connection
• show pools
• show pool-statistics
• show ports
• show power-supplies
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• show refresh-counters
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• show sas-link-health
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• show service-tag-info
• show sessions
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• show snapshot-space
• show snapshots
• show snmp-parameters
• show support-assist
• show syslog-parameters
• show system
• show system-parameters
• show tasks
• show tiers
• show tier-statistics
• show unwritable-cache
• show users
• show vdisks
• show vdisk-statistics
• show versions
• show volume-copies
• show volume-groups
• show volume-names
• show volume-reservations
• show volume-statistics
• show volumes
• shutdown
• suspend replication-set
• test
• trust
• unfail controller
• unmap volume
• verify disk-groups
• verify links
• verify vdisk

abort copy

Description
Aborts a copy volume operation.
When the operation is complete, the destination volume is deleted.

Minimum role
manage

Syntax
abort copy
volume-ID

Parameters
volume-ID
The name or serial number of the source volume or the destination volume. A name that includes a space must be enclosed in double quotes.

Examples
Abort copying volume SourceVol to volume DestVol.
# abort copy SourceVol

See also
copy volume
show volume-copies
show volumes

abort replication

Description
Aborts the current replication operation for the specified replication set.
This command applies to virtual storage only.
The current replication may be running or suspended. Aborting a replication for a replication set in a Ready or Unsynchronized state will generate an error. This command must be run on the replication set's primary system.
NOTE: If you abort a replication operation, the snapshot space allocated for that replication in the primary pool and the secondary pool will not be freed. To free that space, either re-run the initial replication or delete the replication set.

Minimum role: manage
Syntax: abort replication
Parameters: replication-ID
The name or serial number of the replication set in which to abort replications.
Examples:
Abort active replications in replication set RS1
# abort replication RS1
See also:
replicate
resume replication-set
show replication-sets
suspend replication-set

Abort scrub
Description: Aborts a media scrub operation.
Minimum role: manage
Syntax: abort scrub
Parameters:
Specify only one of the following parameters.
disk-group disk-groups
Optional. A comma-separated list of the names or serial numbers of the disk groups to stop scrubbing. A name that includes a space must be enclosed in double quotes.
vdisk vdisks
Optional. A comma-separated list of the names or serial numbers of the linear disk groups to stop scrubbing. A name that includes a space must be enclosed in double quotes.
volume volumes
Optional. A comma-separated list of the names or serial numbers of the volumes to stop scrubbing. A name that includes a space must be enclosed in double quotes.
Examples:
Abort scrubbing disk group dg1
# abort scrub disk-group dg1
Abort scrubbing linear disk group vd1.
# abort scrub vdisk vd1
# abort scrub volume voll
scrub disk-groups scrub vdisk
See also:
scrub disk-groups
scrub vdisk
scrub volume
show disk-groups
abort verify

Description
Aborts a media verify operation.

Minimum role
manage

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

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

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

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

add disk-group

Description
Creates a disk group using specified disks.

NOTE:
- If the system has no disk groups, you can create either a linear or a virtual disk group. Whichever storage type you choose, the system will use that type for new disk groups. To switch to the other storage type, you must first remove all disk groups by using the remove disk-groups command.
- All disks in a disk group must be the same type (enterprise SAS, for example). All disks in a disk group must be the same type (enterprise SAS, for example).

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

For virtual storage, a disk group of midline SAS disks will be used in the Archive tier. A disk group of enterprise SAS disks will be used in the Standard tier. A disk group of SSDs can be used:
- In the Performance tier
- As an all-flash array
- As read cache. A virtual pool can contain only one read-cache disk group
A virtual pool cannot contain both a read-cache disk group and a Performance tier. At least one virtual disk group must exist in a pool before a read-cache disk group can be added. A read-cache disk group can contain a maximum of two disks.

When you add a virtual disk group, the system will first prepare the disk group to be added to a virtual pool. During preparation, the disk group's status will be VPREP and the disk group cannot be removed. When preparation is complete, the disk group will start initializing. During initialization, the disk group's status will be INIT and the disk group will be available to store user data—or the disk group can be removed.

**NOTE:**
- All virtual disk groups in the same tier in a virtual pool should have the same RAID level, capacity, and physical number of disks. This will provide consistent performance across the tier.
- To replace a single-disk read-cache disk group with a multiple-disk read-cache disk group, simply remove the read cache and re-add it.

**NOTE:** If the only disk group in a virtual pool is quarantined, the pool will be inaccessible and attempting to add a new disk group to that pool will fail with a "duplicate name" error. Before you can add a disk group to that pool, you must resolve the problem with the quarantined disk group.

Minimum role: manage
Syntax:
```
add disk-group
[adapt-spare-capacity size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default]
[assigned-to a|b|auto]
[chunk-size 64k|128k|256k|512k]
[disks]
[level nraid|raid0|r0|raid1|r1|raid3|r3|raid5|r5|raid6|r6|raid10|r10|raid50|r50|adapt]
[mode online|offline]
[pool a|b]
[spare disks]
type linear|virtual|read-cache
[name]
```
Parameters:
- **adapt-spare-capacity size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default**
  Optional. For an ADAPT disk group, this specifies the target spare capacity.
  - **size [B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]:** Sets the target spare capacity to a specific size. The unit is optional (B represents bytes). If no unit is specified, GiB will be used, regardless of the currentbase. Whichever unit is set, internally the value will be rounded down to the nearest GiB. If the value is set to 0, the absolute minimum spare space will be used. If this parameter is omitted, the default setting will be used.
  - **default:** Sets the target spare capacity to the sum of the two largest disks in the disk group, which is sufficient to fully recover fault tolerance after loss of any two disks in the group.
- **assigned-to a|b|auto**
  Optional for linear storage. Prohibited for virtual storage. For a system operating in Active-Active ULP mode, this specifies the controller module to own the group. To let the system automatically load-balance groups between controller modules, use auto or omit this parameter. In Single Controller mode, this parameter is ignored; the system automatically load-balances groups in anticipation of the insertion of a second controller in the future.
- **chunk-size 64k|128k|256k|512k**
  Optional for linear storage. Prohibited for virtual storage. Prohibited for ADAPT.
  For linear storage, this specifies the amount of contiguous data, in KB, that is written to a disk-group member before moving to the next member of the group. For NRAID and RAID 1, chunk-size has no meaning and is
therefore not applicable. For RAID 50, this option sets the chunk size of each RAID-5 subgroup. The chunk size of the RAID-50 group is calculated as: \( \text{configured-chunk-size} \times (\text{subgroup-members} - 1) \). The default is 512k.

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

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

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

**disks**

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

- **NRAID**: 1 (linear storage only; not fault tolerant)
- **RAID 0**: 2-16 (linear storage only; not fault tolerant)
- **RAID 1**: 2
- **RAID 3**: 3-16 (linear storage only)
- **RAID 5**: 3-16
- **RAID 6**: 4-16
- **RAID 10**: 4-16
- **RAID 50**: 6-32 (linear storage only)
- **ADAPT**: 12-128

**level**

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

**mode**

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**

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

**spare disks**

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

Required. Specifies the type of disk group to create.

- **linear**: A disk group for linear storage.
- **virtual**: A disk group for virtual storage.
- **read-cache**: A disk group for use as read cache for a virtual pool.

**name**

Optional for a virtual or read-cache disk group. Required for a linear disk group. Specifies a name for the new disk group. The name must be unique system-wide. Input rules:

- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ",, < \
- A value that includes a space must be enclosed in double quotes.

If this parameter is omitted, the system will generate the name `dgcontroller-ID#` where # starts at 01 for a virtual disk group, or `rccontroller-ID` for a read-cache disk group.

**Examples**

Add linear RAID-1 disk group `dg1` with one spare.

```
# add disk-group type linear disks 1.20-21 level r1 spare 1.22 dg1
```

Add ADAPT linear disk group `ALDG`.

```
# add disk-group type linear disks 1.1-12 level adapt ALDG
```

Add a virtual RAID-6 disk group to pool A. The resulting group will have an auto-generated name.

```
# add disk-group type virtual disks 1.16-19 level r6 pool a
```

Add an ADAPT virtual disk group to pool B.

```
# add disk-group type virtual disks 2.1-12 level adapt pool b
```

Add a read-cache disk group to pool B. The resulting group will be named `rcB`.

```
# add disk-group type read-cache disks 1.18-19 pool b
```

**See also**

- `expand disk-group`
- `remove disk-groups`
- `set disk-group`
- `show disk-groups`
- `show disks`

---

**add host-group-members**

**Description**

Adds hosts to a host group. A host group can contain a maximum of 256 hosts.

To add a host to a host group, the host must be mapped with the same access, port, and LUN settings to the same volumes or volume groups as every other initiator in the host group.

**Minimum role**

manage

**Syntax**

```
add host-group-members
hosts hosts
host-group
```

**Parameters**

hosts hosts

A comma-separated list of the names of hosts to add to the specified host group. A name that includes a space must be enclosed in double quotes.

**Examples**

Add existing hosts `Host3` and `Host4` to existing host group `HostGroup1`.

```
# add host-group-members hosts Host3,Host4 HostGroup1
```
add host-members

Description
 Adds initiators to a host. A host can contain a maximum of 128 initiators.

To add an initiator to a host, the initiator must be mapped with the same access, port, and LUN settings to the same volumes or volume groups as every other initiator in the host.

Minimum role
 manage

Syntax
 add host-group-members
 initiators initiators
 host-name

Parameters
 initiators
 A comma-separated list of the nicknames or IDs of initiators to add to the specified host. A name that includes a space must be enclosed in double quotes.

Examples
 Add existing initiators Init3 and Init4 to existing host Host1.
 # add host-members initiators Init3,Init4 Host1

See also
 create host
 remove host-group-members
 show host-groups
 show initiators

add ipv6-address

Description
 Adds a static IPv6 address for a controller network port. A maximum of eight static IPv6 addresses can be configured, four per controller. These addresses can be configured at any time, but can only become active when the set ipv6-network-parameters command's autoconfig parameter is disabled.

All addresses added to the IPv6 address list should be reachable if autoconfig is disabled. They are ignored if autoconfig is enabled.

Static addresses are stored on the controller enclosure midplane. Therefore the addresses will persist even if both controller modules are replaced.

Minimum role
 manage

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

Parameters
 address-label name
 Optional. Lets you specify a name for how the address is used. Input rules:
 - The value is case sensitive.
 - The value can have a maximum of 32 bytes.
 - The value can include spaces and printable UTF-8 characters except: ". , < \
- A value that includes a space must be enclosed in double quotes.
- If this parameter is specified, each interface needs a unique name within the scope of each controller. For example, controller A can have only one address labeled vlan1, and controller B can also have only one address labeled vlan1.

controller a|b
Optional. Specifies to change controller A or B, only. If this parameter is omitted, changes affect the controller being accessed.

ip-address IP-address
Specifies the IPv6 address to add.
The value may include the standard IPv6 /prefixLength 1-128 notation; or the prefixLength may be omitted if the prefix-length parameter is used instead.
The address cannot be used elsewhere in the network port configuration.

prefix-length value
Optional. Specifies the length of the prefix in the IP address.
This parameter is valid only if the ip parameter value does not include /prefixLength notation.

Examples
Add an IPv6 address named vlan1 to the network port in controller A only.

```
# add ipv6-address controller a address-label vlan1 ip-address
2620:0:350:fc02:2c0:ffff:fe28:8787/64
```

See also
remove ipv6-address
set ipv6-network-parameters
show ipv6-addresses
show ipv6-network-parameters

### add spares

#### Description
Designates specified available disks to be spares. A spare can replace a failed disk of the same type (enterprise SAS, for example) and the same or lower capacity in a disk group with a fault-tolerant RAID level other than ADAPT.

If the disks in the system are FDE-capable, spares must also be FDE-capable.

For virtual storage, all spares are global spares.

For linear storage, you can add global spares or dedicated spares.

A global spare is available to any non-ADAPT fault-tolerant disk group with the same disk type. The system supports a maximum of 64 global spares. However, the system will prevent adding global spares if only ADAPT disk groups exist.

A dedicated spare is assigned to a non-ADAPT fault-tolerant linear disk group with the same disk type. A linear disk group can have 4 dedicated spares.

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

To add disks to a disk group to expand its capacity, use the `expand disk-group` command.

#### Minimum role
manage

#### Syntax
```
alloy spares
   [disk-group disk-group]
   [vdisk vdisk]
   disks
```
Parameters

disk-group disk-group
Optional. The name or serial number of a linear disk group to assign the disks to as dedicated spares. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, the disks will be global spares.

vdisk vdisk
Optional. The name or serial number of the linear disk group to assign the disks to as dedicated spares. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, the disks will be global spares.

disks
The IDs of the disks to designate as spares. For disk syntax, see Command syntax.

Examples

Designate disk 1.2 as a global spare.
# add spares 1.2

Designate disk 1.3 as a dedicated spare for vdisk VD1.
# add spares vdisk VD1 1.3

Designate disk 1.3 as a dedicated spare for linear disk group dg1
# add spares disk-group dg1 1.3

See also

remove spares
show disk-groups
show disks
show vdisks

add storage

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

Minimum role
manage

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

Parameters
enclosure enclosure-IDs
Optional. Limits provisioning to a specified enclosure. If this parameter is omitted, the command will use disks from all enclosures.

preview
Optional. Toggles between adding storage and displaying a possible storage configuration.

Examples
Add storage to the system.
# add storage

Add storage to a single enclosure.
# add storage enclosure 3
add volume-group-members

Description

Adds virtual volumes to a volume group.

To add a volume to a volume group, the volume must be in the same pool and have the same mappings as all other members of the group. This means that the volume must be mapped with the same access and port settings to the same initiators, hosts, or host groups.

You cannot add a virtual volume to a volume group that is in a replication set.

Minimum role

manage

Syntax

add volume-group-members

volumes volumes

volume-group

Parameters

volumes volumes

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

volume-group

The name of an existing volume group. A name that includes a space must be enclosed in double quotes.

Examples

Add existing volumes Vol0002 and Vol0003 to existing volume group VolumeGroup1.

# add volume-group-members volumes Vol0002,Vol0003 VolumeGroup1

See also

create volume-group

remove volume-group-members

show volume-groups

show volumes

check firmware-upgrade-health

Description

Checks that the system is ready for a firmware upgrade.

Under normal conditions, firmware upgrade can be performed safely without risk to data availability or integrity. However, when the system is degraded—for example, because of failed or missing components or lack of multi-pathing 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 MESM, SFTP, or FTP to update firmware, see the Administrator’s Guide.
Minimum role: manage

Syntax: check firmware-upgrade-health

Output:
Upgrade Health
Pass: There are no risks to performing firmware upgrade.
Fail: At least one condition exists that presents a risk of upgrade failure or loss of availability.

Condition Detected
The condition that was detected.

Risks
The problems that are likely to result if you do not resolve the conditions before performing a firmware upgrade.

Examples
Check firmware upgrade health for a system that is ready for upgrade.
# check firmware-upgrade-health
Upgrade Health
Pass

Check firmware upgrade health for a system that has problems to be resolved before upgrade.
# check firmware-upgrade-health
Upgrade Health
Fail
Condition Detected
Risks
One or more disks are currently single ported. Data unavailability
At least one controller is not up. Data unavailability
One or more temperature sensors indicate a critical temperature. Code load failure
At least one controller contains unwritten cache data. Data corruption, data loss
One or more supercapacitors have failed. Code load failure
One or more power supplies are not functioning. Code load failure
One or more fans are not functioning.

Basetypes
- code-load-readiness
- code-load-readiness-reason
- status

See also
- show controllers
- show disk-groups
- show disks
- show enclosures
- show fans
- show power-supplies
- show sensor-status
- show system
- show vdisks

check support-assist

Description: Checks the connection from the storage system to the SupportAssist server.
Minimum role: manage
Syntax  
check support-assist

Output  
A message specifies whether the storage system can connect to the SupportAssist server and transmit data to it.

Examples  
Check the connection from the storage system to the SupportAssist server.

# check support-assist

See also  
send support-assist-logs
set support-assist
set support-assist-info
show support-assist

clear cache

Description  
Clears unwritable cache data from both controllers.

NOTE: If you are uncertain whether to use this command, contact technical support for assistance.

This data cannot be written to disk because it is associated with a volume that no longer exists or whose disks are not online. If the data is needed, the volume’s disks must be brought online. If the data is not needed it can be cleared, in which case it will be lost and data will differ between the host and disk. Unwritable cache is also called orphan data.

CAUTION: Only use this command when all disk groups are online and accessible from the host. Clearing cache for a volume that is offline or quarantined could result in data loss.

You can clear unwritable cache data for a specified volume or for all volumes.

Minimum role  
manage

Syntax  
clear cache

Parameters  
volume volume

Optional. The name or serial number of a specific volume for which to clear unwritable cache data. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, unwritable cache data is cleared for all volumes.

Examples  
Clear unwritable cache data for volume V1 from both controllers.

# clear cache volume v1

See also  
show unwritable-cache
show volumes

clear disk-metadata

Description  
Clears metadata from leftover disks. For a leftover disk, the show disks command shows the Usage value LEFTOVR.

CAUTION: Only use this command when all disk groups are online and leftover disks exist. Improper use of this command may result in data loss.

NOTE: If you are uncertain whether to use this command, contact technical support for assistance.

Each disk in a disk group has metadata that identifies the owning disk group, the other members of the disk group, and the last time data was written to the disk group. The following situations cause a disk to become a leftover:
- Disk group members’ timestamps do not match so the system designates members having an older timestamp as leftovers.
- A disk is not detected during a rescan, then is subsequently detected.

When a disk becomes a leftover, the following changes occur:
- The disk's health becomes Degraded and its How Used state becomes LEFTOVR
- The disk is automatically excluded from the disk group, causing the disk group's health to become Degraded or Fault, depending on the RAID level.
- The disk's fault LED becomes illuminated.

If spares are available, and the health of the disk group is Degraded, the disk group will use spares to start reconstruction. When reconstruction is complete, you can clear the leftover disk's metadata. Clearing the metadata will change the disk's health to OK and its How Used state to AVAIL, making the disk available for use in a new disk group or as a spare.

If spares are not available to begin reconstruction, or reconstruction has not completed, keep the leftover disk so that you'll have an opportunity to recover its data.

This command clears metadata from leftover disks only. If you specify disks that are not leftovers, the disks are not changed.

**Minimum role**
manage

**Syntax**
clear disk-metadata

disks

**Parameters**
disks

The IDs of the leftover disks from which to clear metadata. For disk syntax, see Command syntax.

**Examples**
Clear metadata from leftover disk 1.1.

# clear disk-metadata 1.1

**See also**
show disks

clear dns-parameters

**Description**
Clears configured DNS settings for each controller module.

**Minimum role**
manage

**Syntax**
clear dns-parameters
[controller a|b|both]

**Parameters**
controller a|b|both

Optional. Specifies whether to change controller A, B, or both. If this parameter is omitted, changes affect the controller being accessed.

**Examples**
Clear DNS settings for controller A.

# clear dns-parameters controller a

**See also**
set dns-parameters
set email-parameters
show dns-parameters
show email-parameters

clear events

**Description**
Clears the event log in controller A, B, or both.
clear expander-status

**Description**
Clears the counters and status for SAS expander lanes.

- **NOTE:** This command is for use by or with direction from technical support.

Counters and status can be reset to a good state for all enclosures, or for a specific enclosure whose status is Error as shown by the `show expander-status` command.

- **NOTE:** If a rescan is in progress, the clear operation will fail with an error message saying that an EMP does exist. Wait for the rescan to complete and then retry the clear operation.

**Minimum role**
manage

**Syntax**
clear expander-status

**Parameters**
[enclosure ID]

Optional. The enclosure number. If this parameter is omitted, the command clears the counters and status of all enclosures.

**Examples**
Clear the expander status for the enclosure with ID 1.

`# clear expander-status enclosure 1`

**See also**
show expander-status

clear fde-keys

**Description**
Clears the lock key ID and import lock ID used with Full Disk Encryption.

Use this command to temporarily deny access to data on the disks during a period when the system will not be under your physical control. If the lock keys are cleared while the system is secured, the system will enter the Secured, Lock Ready state, in preparation for the system being powered down and transported. No further FDE configuration will be allowed until the system has been power cycled. Disks will remain in the Secured, Unlocked state until they are power cycled.

After the system has been transported and powered back up, the system and disks will enter the Secured, Locked state; disk group status will become QTOF; pool health will become Degraded; and volumes will become inaccessible. To restore access to data, re-enter the original passphrase by using the `set fde-lock-key` command.

**Minimum role**
manage

**Syntax**
clear fde-keys

**Parameters**
[current-passphrase value]

Optional. If the system is currently secured, you can provide the current passphrase as part of the command. If this parameter is omitted, the command will prompt you for the current passphrase.

Examples

Clear the lock keys in preparation for shipping a system to a new location.

# clear fde-keys current-passphrase myPassphrase

See also

set fde-import-key
set fde-lock-key
set fde-state
show fde-state

clear fenced-data

Description

Clears fenced data blocks from a specified disk group.

If the specified disk group has no fenced data, the command returns an error and the disk group is not affected.

Minimum role

monitor

Syntax

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

disk-group disk-group

Parameters

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

vdisk vdisk

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

Examples

Clear fenced data for disk group ar5.

# clear fenced-data disk-group ar5

See also

show fenced-data

clear replication-queue

Description

Clears the replication queue for a specified replication set.

If a replication request is initiated for a replication set that is already running a replication, and the replication set’s queue policy is Queue Latest, the new replication request will be queued. A maximum of one replication can be queued.

If a queued replication is removed, event 587 will be logged with Informational severity.

Minimum role

manage

Syntax

clear replication-queue
replication-set-ID

Parameters

replication-set-ID

The name or serial number of the replication set. A name that includes a space must be enclosed in double quotes.

Examples

Clear the replication queue for replication set RepSet1.

# clear replication-queue RepSet1
See also
create replication-set
set replication-set

clear support-assist-proxy

Description
Clears configured SupportAssist Proxy settings.

Minimum role
manage

Syntax
clear support-assist-proxy

Examples
Clear SupportAssist Proxy settings.
# clear support-assist-proxy

See also
check support-assist
send support-assist-logs
set support-assist
set support-assist-info
show support-assist

copy volume

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

The source volume can be a virtual base volume or a virtual snapshot. The destination volume will be
completely independent of the source volume and will have a different serial number. The destination volume
will be created with the default attributes of a standard volume and will not inherit settings, such as snapshot-
retention settings, from the source volume.

You can use this command to:
• Copy a base volume to a new base volume.
• Promote a snapshot to a base volume to make the snapshot independent of its parent volume.
• Copy a volume from one pool to another.

Reasons to promote a snapshot include:
• You want to delete the snapshot's base volume without losing the data in the snapshot.
• You want to set a different tier preference for a snapshot than for its parent (or for another snapshot in
  the same tree).
• You don't want the volume's unique data to be counted against overall pool snapshot space (because it
  might cause deletion of other snapshots).
• The volume's snapshot tree is full and no more snapshots can be taken, but you don't want to delete any
  snapshots. Instead, you can promote them.
• The volume's purpose has changed and is no longer considered a subordinate volume.
• You want to balance usage between the two pools, by copying a volume from one pool to the other and
  then deleting the volume from the source pool.

To ensure the data integrity of the destination volume, unmount and unmap the source volume from host
access before starting the copy operation. When the copy operation is complete, mount the destination
volume and test to ensure that it is functional. Then you may remount the source volume—or if it's no longer
needed, delete it.

To see the progress of a volume copy operation, use the show volume-copies command.

During a copy operation:
• Progress will be periodically logged to allow it to resume if it is interrupted by controller failover or failure.
• The source volume and destination volume cannot be deleted.
• If the source volume or the destination volume fails, the copy operation will fail and be automatically canceled, the destination volume will be automatically deleted, and event 267 will be logged with Error severity.
• If the destination pool runs out of space, or the destination volume was not created due to a shortage of physical storage in a non-thin-provisioned system, the copy operation will fail and be automatically canceled, the destination volume will be automatically deleted, and event 267 will be logged with Error severity.

Minimum role
manage

Syntax
copy volume

[destination-pool destination-pool-ID]
name destination-volume-name
source-volume-ID

Parameters
destination-pool destination-pool-ID
Optional. The name or serial number of the virtual pool in which to create the destination volume. This must be the pool that contains the source volume, and can be either pool in the system. If this parameter is omitted, the destination volume will be created in the same pool as the source volume.

name destination-volume-name
A name for the volume to create in the destination pool. Input rules:
• The value is case sensitive.
• The value can have a maximum of 32 bytes.
• The value can include spaces and printable UTF-8 characters except: ", <>\n• A value that includes a space must be enclosed in double quotes.

source-volume-ID
The name or serial number of the source volume to copy. A name that includes a space must be enclosed in double quotes.

Examples
Copy volume SourceVol in pool A to new volume DestVol in pool B.
copy volume SourceVol destination-pool B name DestVol

See also
abort copy
show pools
show volume-copies
show volumes

create certificate

Description
Creates or removes a custom security certificate.
The storage system supports use of unique certificates for secure data communications, to authenticate that the expected storage systems are being managed. Use of authentication certificates applies to the HTTPS protocol, which is used by the web server in each controller module. The MESM and SMI-S interfaces use the same certificate.

After using this command you must restart each Management Controller to which the change is applied to have the change take effect

Minimum role
manage

Syntax
create certificate
[a|b|both]
[contents content-string]
[noprompt]
create certificate

Parameters

a|b|both

Optional. Specifies whether to apply the change to controller A, B, or both. If this parameter is omitted, the change is applied to the controller being accessed.

contents contents-string

Optional. A security certificate is generated based on the supplied content. The content becomes the subject of the certificate creation request and must be formatted as /type0=value0/type1=value1/type2=... , where types include C for country, ST for state or province, L for location, CN for common name, and O for organization. Invalid types will be omitted from the content string. The content string cannot exceed 1024 characters and can include printable UTF-8 characters except space or semicolon. An example is /C=US/ST=CO/O=MyOrganization/CN=www.mysite.com. You must specify either this parameter or the restore parameter or the unique parameter.
	noprompt

Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

restore

Optional. The system-generated certificate is restored and the custom certificate is discarded. The custom certificate may have been created with this CLI command or uploaded using SFTP or FTP. You must specify either this parameter or the contents parameter or the unique parameter.

unique

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

Examples

Regenerate the system certificate with a new private key.

# create certificate unique

Create a custom certificate using a content string.

# create certificate contents /C=US/ST=CO/L=NewYork/O=MyCompany/CN=www.mycompany.com

Restore the system-generated certificate and remove the custom certificate.

# create certificate restore

See also

restart mc
restart sc
show certificate

create chap-record

Description

Creates a CHAP record to authenticate iSCSI login requests.

When CHAP is enabled, the record enables authentication between the originator (initiator) and recipient (target) of a login request. This command is permitted whether or not CHAP is enabled.

**NOTE:** For information about setting up CHAP for use in a peer connection, see the topic about creating a peer connection in MESM documentation.

The CHAP record can specify one name-secret pair to authenticate the originator only (one-way CHAP) or two pairs to authenticate both the originator and the recipient (mutual CHAP).

For a login request from an initiator to a storage system, the initiator is the originator and the storage system is the recipient. Because CHAP works during login, to make CHAP changes take effect you must reset any active iSCSI host links.
In a peer connection, a storage system can act as the originator or recipient of a login request. As the originator, with a valid CHAP record it can authenticate CHAP even if CHAP is disabled. This is possible because the system will supply the CHAP secret requested by its peer and the connection will be allowed.

Minimum role
manage

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

Parameters
name originator-name
The originator name, typically in IQN format. The name is case sensitive and can have a maximum of 223 bytes, including 0–9, lowercase a–z, hyphen, colon, and period

secret originator-secret
The secret that the recipient uses to authenticate the originator. The secret is case sensitive and can include 12–16 bytes. The value can include spaces and printable UTF-8 characters except: * <

mutual-name recipient-name
Optional; for mutual CHAP only. The recipient name, typically in IQN format. The name is case sensitive and can have a maximum of 223 bytes, including 0–9, lowercase a–z, hyphen, colon, and period. To determine a storage system's IQN, use the show ports command to view the Target ID value for an iSCSI port. This parameter and mutual-secret must be set together.

mutual-secret recipient-secret
Optional; for mutual CHAP only. The secret that the originator uses to authenticate the recipient. The secret is case sensitive, can include 12–16 bytes, and must differ from the originator secret. The value can include spaces and printable UTF-8 characters except: * <

A storage system's secret is shared by both controllers. This parameter and mutual-name must be set together.

Examples
Create a one-way CHAP record to enable a storage system to authenticate a host initiator.

# create chap-record name iqn.1991-05.com.microsoft:myhost.domain secret 123456abcDEF

See also
delete chap-records
set chap-record
show chap-records
show iscsi-parameters
show ports

create host

Description
Creates a host with an associated name.

You can use the create host command to create a host that groups together specified initiators, and optionally to add the host to a host group. You can create a maximum of 512 hosts, each containing a maximum of 128 initiators.

Minimum role
manage

Syntax

create host
[host-group host-group] [initiators initiators]
[profile standard]
name

Parameters

host-group  host-group
Optional. The name of an existing host group to which to add the new host.

initiators  initiators
A comma-separated list of initiator names, IDs, or both, with no spaces
For FC, the ID is a WWPN. For SAS, the ID is a WWPN. For iSCSI, the ID is an IQN. A WWPN can include a
colon between each byte but the colons will be discarded.

profile  standard
Optional. Default profile.

name
A name for the host. Input rules:
• The value is case sensitive.
• The value can have a maximum of 32 bytes.
• The value can include spaces and printable UTF-8 characters except: ", . < \
• A value that includes a space must be enclosed in double quotes.

Examples

Create host Host1 that includes two FC initiators
# create host initiators 1000000f0a13870e,1000000f0a13870f Host1
Create host Host2 that includes two iSCSI initiators.
# create host initiators iqn.1992-01.com.example:storage.host2.port1,
  iqn.1992-01.com.example:storage.host2.port2 Host2
Create host Host4 by pasting a WWPN that includes colons.
# create host initiators 20:70:00:c0:ff:d7:4c:07 Host4

See also

set host
set initiator
show host-groups
show initiators

create host-group

Description
Creates a host group that includes specified hosts. You can create a maximum of 32 host groups, each
containing a maximum of 256 hosts.

Minimum role
manage

Syntax
create host-group
hosts  hosts
host-group

Parameters

hosts  hosts
A comma-separated list of the names of hosts to include in the host group. A name that includes a space
must be enclosed in double quotes.

host-group
A name for the host group. Input rules:
• The value is case sensitive.
• The value can have a maximum of 32 bytes.
• The value can include spaces and printable UTF-8 characters except: ", . < \
• A value that includes a space must be enclosed in double quotes.
Examples

Create a host group named HostGroup1 that includes hosts Host1 and Host2.

# create host-group hosts Host1,Host2 HostGroup1

See also

add host-group-members
delete host-groups
remove host-group-members
set host-group
show host-groups

create peer-connection

Description

Creates a peer connection between two storage systems.

The peer connection is defined by the ports that connect the two peer systems, as well as the name of the peer connection. The local system uses the remote address to internally run the `query peer-connection` command. The results of the query are used to configure the peer connection.

The prerequisites to create a peer connection are:

- Both systems must have iSCSI or FC host ports. Ports at both ends of the connection must use the same protocol.
- 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.
- You must specify the username and password of a user with the manage role on the remote system.

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 will fail.

Host port evaluation is done at the start or resumption of each replication operation.

- At most, two ports will be used.
- Ports with optimized paths will be used first. Ports with unoptimized paths will be used if no optimized path exists. If only one port has an optimized path, then only that port will be used.
- The replication will not use another available port until all currently used ports become unavailable.

If a single host port loses connectivity, event 112 will be logged. Because a peer connection is likely to be associated with multiple host ports, the loss of a single host port may degrade performance but usually will not cause the peer connection to be inaccessible.

Minimum role

manage

Syntax

create peer-connection

[remote-password password]
remote-port-address remote-port-address
remote-username username name

Parameters

remote-password password

Optional in console format; required for API format. The password of the user specified by the remote-username parameter. If this parameter is omitted, the command prompts you to enter and re-enter a value, which is displayed obscured for security reasons

remote-port-address remote-port-address

Specifies the FC WWN or iSCSI IP address of the remote system with which to create a peer connection

remote-username username

The name of a user in the remote system. This must be a user with the manage role to remotely configure or provision that system.

ame
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 via iSCSI to a second system, create peer connection Peer1 to remote port address 192.168.200.22, using the credentials of remote user John.

```
# create peer-connection remote-port-address 192.168.200.22 remote-username John remote-password P@ssw0rd Peer1
```

On a storage system that will replicate via FC to a second system, create peer connection Peer2 to remote port address 247000c0ff1a45b8, using the credentials of remote user Admin1.

```
# create peer-connection remote-port-address 247000c0ff1a45b8 remote-username Admin1 Peer2 Enter remote password: *******
```

**See also**

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

---

**create replication-set**

**Description**

Creates a replication set for a specified volume or volume group. This command is not applicable to a system with SAS controller modules.

For the maximum number of replication sets that can be created, see the “System configuration limits” appendix in the Administrator’s Guide.

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 discard, or three each if the queue policy is set to queue-latest.
- A replication set for a volume group consumes two internal volume groups if the queue policy is set to discard, or three if the queue policy is set to queue-latest. Each internal volume group contains a number of volumes equal to the number of volumes in the base volume group.

Internal snapshots and internal volume groups count against system limits, but do not display.

A peer connection must already be defined to create and use a replication set.

The command will fail if the secondary volume names already 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 volume(s), 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 will create a snapshot of the data image being replicated.

• For a secondary volume, when a replication successfully completes it will create a snapshot of the data image 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 will not be 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 a replication is requested, whether or not the replication completes — for example, if the replication was queued and subsequently removed 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 automatically created by snapshot history rules will not be deleted. You will be able to manage those snapshots like any other snapshots.

• Manually creating a snapshot will not increase the snapshot count 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 intended to be taken, the snapshot will not occur, and the snapshot number is incremented.

• A snapshot 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**

**Syntax**

create replication-set

peer-connection peer-connection-ID

primary-address ip=IPs|wwnn=WWNNs

primary-volume volume-ID | volume-group-ID

[queue-policy discard|queue-latest]

[secondary-pool A|B]

[secondary-volume-name name]

[snapshot-basename basename]

[snapshot-count #]

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

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

name

**Parameters**

peer-connection peer-connection-ID

Specifies the name or serial number of the peer connection on which to create the replication set.

primary-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs

Optional. Specifies host ports in the local system by IP address, World Wide Node Name, or World Wide Port Name. An IP address value can include a port number. For example, 10.134.2.1:3260. Multiple values must be separated by commas and no spaces. For example: ip=10.134.2.1,10.134.2.2.

primary-volume volume-ID|volume-group-ID

Specifies the name or serial number of a volume or volume group on the local system. Volume-groups must be specified with the name and .* notation used in mapping.
queue-policy discard|queue-latest

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

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

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

secondary-pool A|B

Optional. Specifies an existing virtual pool on the remote peer. If this is not specified, the system will use the corresponding pool on the remote system. For example, if pool A is used on the local system, pool A will be used on the remote system. If this is not specified and the corresponding pool on the remote side does not exist, this command will fail.

secondary-volume-name name

Optional. Specifies a name for the secondary volume. If this is not specified the name from the primary volume will be used. For volume-group targets, all contained volume names must be unique. Input rules:

- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ",<\`
- A value that includes a space must be enclosed in double quotes.

There is no default.

snapshot-count #

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

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

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

snapshot-history disabled|off|secondary|both

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

- disabled or off: A snapshot history 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

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 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.
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: ",,<\n- A value that includes a space must be enclosed in double quotes.

Examples

Create replication set RS1 for primary volume Vol1 on the peer connection Peer1.

# create replication-set peer-connection Peer1 primary-volume Vol1 RS1

Create replication set RS1 for volume group VG1.* on the peer connection Peer1.

# create replication-set peer-connection Peer1 primary-volume VG1.* RS1

Create replication set repset2 for volume vol2 on peer-connection Lab; specify that the system cannot automatically delete history snapshots in this set; and enable snapshot history for both the primary volume and the secondary volume, allowing up to 5 replication snapshots with the basename repsnapvol2 to be retained for each volume.

# create replication-set peer-connection Lab primary-volume vol2 secondary-pool A snapshot-retention-priority never-delete snapshot-history both snapshot-basename repsnapVol2 snapshot-count 5 repset2

See also

delete replication-set
resume replication-set
set replication-set
show replication-sets
suspend replication-set

create schedule

Description

Schedules a task to run automatically.

You can schedule a replication task on the replication set’s primary system only.

Minimum role

manage

Syntax

create schedule

schedule-specification "specification"

task-name task-name

schedule-name

Parameters

schedule-specification "specification"

Defines when the task will first run, and optionally when it will recur and expire. You can use a comma to separate optional conditions. Dates cannot be in the past. For times, if neither AM nor PM is specified, a 24-hour clock is used.

- start yyyy-mm-dd hh:mm[AM|PM]
  Specifies a date and a time in the future to be the first instance when the scheduled task will run, and to be the starting point for any specified recurrence
- [every # minutes|hours|days|weeks|months|years]
  Specifies the interval at which the task will run.

For better performance when scheduling a TakeSnapshot task that will run under heavy I/O conditions or on more than three volumes, the retention count and the schedule interval should be set to similar values. For example if the retention count is 10 then the interval should be set to 10 minutes.

For a Replicate task, the minimum interval is 30 minutes

- [between hh:mm[AM|PM] and hh:mm[AM|PM]]
Constrains the time range during which the task is permitted to run. Ensure that the start time is within the specified time range.

- [only any|first|second|third|fourth|fifth|last|#st|#nd|#rd|#th day| weekday|weekendday| Sunday|Monday|Tuesday|Wednesday|Thursday|Friday| Saturday of year|month|January|February| March|April|May|June|July|August| September|October|November|December]

Constrains the days or months when the task is permitted to run. Ensure that this constraint includes the start date.

- [count #]

Constrains the number of times the task is permitted to run.

- [expires yyyy-mm-dd hh:mm[AM|PM]]

Specifies when the schedule expires, after which the task will no longer run.

```
task-name
```

The name of an existing task to run. The name is case sensitive. A name that includes a space must be enclosed in double quotes.

```
schedule-name
```

A name for the new schedule. Input rules:

- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ",<\`
- A value that includes a space must be enclosed in double quotes.

### Examples

Create schedule Sched1 that runs Task1 for the first time on March 1, 2014, runs daily between midnight and 1:00 AM, and runs for the last time in the morning of January 1, 2015.

```shell
# create schedule schedule-specification "start 2014-03-01 00:01, every 1 days, between 12:00 AM and 1:00 AM, expires 2015-01-01 1:00 AM" task-name Task1 Sched1
```

Create schedule Sched2 that runs Task2 for the first time on March 1, 2014, and on the first weekday of each month, with no expiration.

```shell
# create schedule schedule-specification "start 2012-03-01 00:01 only first weekday of month" task-name Task2 Sched2
```

### See also

- delete schedule
- set schedule
- show schedules
- show tasks

### create snapshots

#### Description

Creates a snapshot of each specified source volume. This command applies to virtual storage only.

#### Minimum role

manage

#### Syntax

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

#### Parameters

A comma-separated list of the names or serial numbers of 1–16 source volumes of which to create snapshots. A name that includes a space must be enclosed in double quotes.

```
snap-names
```

52 Alphabetical list of commands
A comma-separated list of names for the resulting snapshots. Snapshot names must be unique system-wide. Input rules:

- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: " , < \\
- A value that includes a space must be enclosed in double quotes

Examples
Create snapshots of volumes V4 and V5.
# create snapshots volumes V4,V5 V4snap,V5snap

See also
show snapshots
show volumes

create task

Description
Creates a task that can be scheduled.

You can create a task to:

- Enable drive spin down for spinning disks. The disks cannot be in a virtual pool. The disks cannot be using ADAPT data protection. You can use this to enable or resume spin down during hours of infrequent activity. When drive spin down is enabled, disks will spin down after 60 minutes of inactivity by default.
- Disable drive spin down. You can use this to disable or suspend spin down during hours of frequent activity.
- Create a snapshot of a source volume, which can be a virtual base volume or a virtual snapshot.
- Reset a snapshot. This deletes the data in the snapshot and resets it to the current data in the volume from which the snapshot was created. The snapshot’s name and other volume characteristics are not changed.
- Replicate a virtual replication set’s primary volume or volume group to a peer system

⚠️ CAUTION: Before scheduling a ResetSnapshot task, consider that if the snapshot is mounted/presented/mapped to a host, the snapshot must be unmounted/unpresented/unmapped before the reset is performed. Leaving it mounted/presented/mapped can cause data corruption. You should create a scheduled job on the host to unmount/unpresent/unmap the snapshot prior to resetting it.

Minimum role
manage

Syntax
To create a task to take a snapshot:
create task
retention-count #
snapshot-prefix prefix
source-volume volume
type TakeSnapshot
name

To create a task to reset a snapshot:
create task
snapshot-volume volume
type ResetSnapshot
name

To create a task to replicate a virtual volume:
create task
[last-snapshot]
replication-set replication-set-ID

type Replicate

name

To create a task to enable spin down:
create task

type EnableDSD

name

To create a task to disable spin down:
create task

type DisableDSD

name

Parameters

last-snapshot

Optional. For a Replicate task this specifies to replicate the most recent snapshot of the primary volume. This snapshot may have been created either manually or by the snapshot history feature

replication-set replication-set-ID

For a Replicate task this specifies the ID of the replication set to replicate.

retention-count #

For a TakeSnapshot task this specifies the number of snapshots created by this task to retain, from 1 to 8 if the large-pools feature is enabled, or from 1 to 16 if the large-pools feature is disabled. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted.

snapshot-prefix prefix

For a TakeSnapshot task this specifies a label to identify snapshots created by this task. Input rules:
  - The value is case sensitive.
  - The value can have a maximum of 26 bytes.
  - The value can include spaces and printable UTF-8 characters except: ",", ",", <, 
  - A value that includes a space must be enclosed in double quotes.

snapshot-volume volume

For a ResetSnapshot task this specifies the name or serial number of the snapshot to reset. A name that includes a space must be enclosed in double quotes.

source-volume volume

For a TakeSnapshot task this specifies the name or serial number of the source volume of which to take a snapshot. A name that includes a space must be enclosed in double quotes.

type TakeSnapshot | ResetSnapshot | Replicate | EnableDSD | DisableDSD

The task type:
  - TakeSnapshot: Creates a snapshot.
  - ResetSnapshot: Resets the data in a snapshot.
  - Replicate: Replicates a virtual replication set’s primary volume or volume group to a peer system.
  - EnableDSD: Enables drive spin down.
  - DisableDSD: Disables drive spin down.

name

A name for the new task. Input rules:
  - The value is case sensitive.
  - The value can have a maximum of 32 bytes.
  - The value can include spaces and printable UTF-8 characters except: ",", ",", <, 
  - A value that includes a space must be enclosed in double quotes.
Create task Snap that creates a snapshot of volume VD1_V1 and retains only the latest four snapshots with the prefix VD1_V1 (for example, VD1_V1_S0001).

```
# create task type TakeSnapshot source-volume VD1_V1 snapshot-prefix VD1_V1 retention-count 4 Snap
```

Create task Reset that resets snapshot VD1_V1_S0001.

```
# create task type ResetSnapshot snapshot-volume VD1_V1_S0001 Reset
```

Create task replicateRS1 that replicates virtual replication set RS1's primary volume or volume group.

```
# create task type Replicate replication-set RS1 replicateRS1
```

Create task replicateRS2 that replicates the newest snapshot of virtual replication set RS2's primary volume or volume group.

```
# create task type Replicate replication-set RS2 replicateRS2 last-snapshot
```

Create task taskDSDresume to enable or resume spin down.

```
# create task type EnableDSD taskDSDresume
```

Create task taskDSDsuspend to disable or suspend spin down.

```
# create task type DisableDSD taskDSDsuspend
```

**See also**

create schedule
delete task
set task
show tasks
show volumes

### create user

**Description**

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

**Minimum role**

manage

**Syntax**

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

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 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.

interfaces

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

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

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

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

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

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

precision #

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

privacy-password

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 8–32 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’s roles as one or more of the following values:
• monitor: User can view but not change system settings. This is the default.
• manage: User can view and change system settings.
• diagnostic: User can view and change system settings.
Multiple values must be separated with a comma (with no spaces). If multiple values are specified, the user’s access to commands will be determined by the highest role specified.

storage-size-base 2|10

Optional. Alias for base.

storage-size-precision #

Optional. Alias for precision

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

Optional. Alias for units.

temperature-scale celsius|c|fahrenheit|f

Optional. Sets the scale for display of temperature values:
• fahrenheit or f: Temperatures are shown in degrees Fahrenheit.
• celsius or c: Temperatures are shown in degrees Celsius. This is the default

timeout #

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

trap-host address

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

type novice|standard|advanced|diagnostic

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

units auto|MB|GB|TB

Optional. Sets the unit for display of storage-space sizes.
• auto: Sizes are shown in units determined by the system. This is the default.
• MB: Sizes are shown in megabytes.
• GB: Sizes are shown in gigabytes.
• TB: Sizes are shown in terabytes.

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

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

Examples

Create user John who will view system information using base 2 in the MESM.

# create user base 2 interfaces wbi roles monitor John
Enter new password: ********
Re-enter new password: ********

Create user MIB that can view the SNMP MIB, using authentication and encryption.

# create user interfaces snmpuser password Abcd1234 authentication-type SHA privacy-type AES privacy-password Abcd%5678 MIB

Create user Traps that can receive SNMP trap notifications, using authentication without encryption.

# create user interfaces snmptarget authentication-type SHA trap-host 172.22.4.171 Traps Enter new password: ********
Re-enter new password: ********

See also

delete user
set snmp-parameters
set user
show users

create vdisk

Description

Creates a linear disk group using the specified RAID level, disks, and spares. This command applies to linear storage only.

All disks in the disk group must be the same type (enterprise SAS, for example).

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

For each RAID level, the minimum and maximum numbers of disks supported are:

- NRAID: 1
- RAID 0: 2–16
- RAID 1: 2
- RAID 3: 3–16
- RAID 5: 3–16
- RAID 6: 4–16
- RAID 10: 4–16
- RAID 50: 6–32

For best practices for creating disk groups, see the Administrator's Guide.

When you create a linear disk group, the system creates a linear pool with the same name. A linear pool can contain a single linear disk group.

Minimum role

manage

Syntax

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

Parameters

assigned-to a|b|auto

Optional. For a system operating in Active-Active ULP mode, this specifies the controller to own the disk group. To let the system automatically load-balance vdisks between controllers, use auto or omit this parameter. In Single Controller mode, this parameter is ignored; the system automatically load-balances vdisks in anticipation of the insertion of a second controller in the future.

chunk-size 64k|128k|256k|512k

Optional. The amount of contiguous data, in KB, that is written to a disk group member before moving to the next member of the disk group. For RAID 50, this option sets the chunk size of each RAID-5 subgroup. The chunk size of the RAID-50 disk group is calculated as: \( \text{configured-chunk-size} \times (\text{subgroup-members} - 1) \). For NRAID and RAID 1, chunk-size has no meaning and is therefore not applicable. The default size is 512k.

disks disks

The IDs of the disks to include in the disk group. RAID 10 requires a minimum of two RAID-1 subgroups each having two disks. RAID 50 requires a minimum of two RAID-5 subgroups each having three disks. For disk syntax, see Command syntax.

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

Specifies the RAID level.

mode online|offline

Optional. Specifies whether the disk group is initialized online or offline.

- **online**: Enables you to use the disk group immediately after creating it while it is initializing. Because online uses the verify method to create the disk group, it takes longer to complete initializing than offline. Online initialization is fault-tolerant. This option is the default.
- **offline**: You must wait for the disk group initialization process to finish before using the disk group. However, offline takes less time to complete initializing than online.

spare disks

Optional. The IDs of 1–4 dedicated spares to assign to a RAID 1, 3, 5, 6, 10, or 50 disk group. For disk syntax, see Command syntax.

name

A name for the new disk group. Input rules:

- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ", . < \n".
- A value that includes a space must be enclosed in double quotes.

Examples

Create a RAID-1 linear disk group named VD1 using two disks.

```
# create vdisk level raid1 disks 0.1,0.3 VD1
```

Create a RAID-50 linear disk group named VD2 having three RAID-5 subgroups, each having three disks.

```
# create vdisk level r50 disks 0.1-3:0.4-6:0.7-9 VD2
```

Create a RAID-6 linear disk group named vdR6 using four disks.

```
# create vdisk level r6 disks 2.3-4,2.8-9 vdR6
```

See also

delete vdisks
set vdisk
show disks
show vdisks

create volume

Description

Creates a volume in a linear disk group or virtual pool.
You must specify a size for the volume. You can create the volume unmapped or set its default mapping. Default mapping settings apply to all hosts, unless overridden by an explicit mapping between a host and the volume. You can later change the mapping by using the `map volume` and `unmap volume` commands. By default, this command will not map the created volume.

⚠️ **CAUTION:** Using a default mapping for a volume will allow multiple hosts to access the volume. To avoid multiple hosts mounting the volume and causing corruption, the hosts must be cooperatively managed, such as by using cluster software.

Volume sizes are aligned to 4.2 MB (4 MiB) boundaries. When a volume is created or expanded, if the resulting size would be less than 4.2 MB it will be increased to 4.2 MB; if the resulting size would be greater than 4.2 MB it will be decreased to the nearest 4.2 MB boundary.

To create multiple volumes at once, use the `create volume-set` command.

💡 **NOTE:** For virtual storage, you cannot add a volume to a volume group that is in a replication set.

For virtual storage, you can set the retention priority for snapshots of the volume. If automatic deletion of snapshots is enabled, the system uses the retention priority of snapshots to determine which, if any, snapshots to delete. Snapshots are considered to be eligible for deletion if they have any retention priority other than never-delete. Eligible snapshots are considered for deletion by priority and age. The oldest, lowest priority snapshots are deleted first. Snapshots that are mapped or are not leaves of a volume’s snapshot tree are not eligible for automatic deletion.

### Minimum role

manage

### Syntax

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

### Parameters

- **access read-write|rw|read-only|ro|no-access**
  Optional. The access permission to use for the mapping: `read-write (rw)`, `read-only (ro)`, or `no-access`. If `no-access` is specified, the volume is not mapped. The default is `read-write`.

- **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 in SSD applications and improve performance.
  - `disabled` or `off`: Optimized page allocation is disabled. This is the default.
  - `enabled` or `on`: Optimized page allocation is enabled.

- **lun LUN**
  Optional if the `access` parameter is set to `no-access`. Specifies the LUN to assign to the mapping on all ports.

- **pool pool**
  Optional for linear volumes. Required for virtual volumes. The name or serial number of the pool in which to create the volume.

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

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

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

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

Sets the volume size. The unit is optional (B represents bytes). If base 2 is in use, whether you specify a base-2 or base-10 unit, the resulting size will be in base 2. If no unit is specified, the default is 512-byte blocks. A value less than 4.2 MB (4 MiB) will be increased to that size. A value greater than 4 MB will be decreased to the nearest 4 MB boundary. The maximum volume size is 140 TB (128 TiB).

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.

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

Optional. For virtual storage, this specifies the retention priority for snapshots of the volume.
- **never-delete**: Snapshots will never be deleted.
- **high**: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted.
- **medium**: Snapshots may be deleted after all eligible low-priority snapshots have been deleted. This is the default.
- **low**: Snapshots may be deleted.

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

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

```
vdisk vdisk
```

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

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

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

```
name
```

A name for the new volume. The name must be unique system-wide. Input rules:
- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ".", <, >
- A value that includes a space must be enclosed in double quotes.

Examples

Create the 20-GB volume V1 in disk group VD1, and map it to ports A1 and B1 using LUN 5.

```
# create volume vdisk VD1 size 20GB ports a1,b1 lun 5 V1
```

Create a 100-GB standard volume named MyVolume in pool A, map it to use LUN 5 with read-write access through port 1 in each controller, add it to volume group MyGroup, and tune tier-migration for performance.

```
# create volume MyVolume pool A size 100GB access rw lun 5 ports 1 volume-group MyGroup tier-affinity performance
```
Create a 20-GB standard volume named Secrets in storage pool A, and map it to use LUN 333 with read-only access through all ports.

```bash
# create volume Secrets pool A size 20GB lun 333 access read-only
```

Create a volume Vol1 with snapshot retention priority high.

```bash
# create volume snapshot-retention-priority high Vol1
```

**See also**

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

## create volume-group

**Description**

Creates a volume group that includes specified volumes. You can create a maximum of 256 volume groups. A volume group can contain a maximum of 1024 volumes. All volumes in a volume group must be in the same pool.

**Minimum role**

manage

**Syntax**

```
create volume-group
volumes volumes
directory directory
```

**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.

**Examples**

Create a volume group named VGroup1 that includes hosts Vol0001 and Vol0002.

```bash
# create volume-group volumes Vol0001,Vol0002 VGroup1
```

**See also**

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

## create volume-set

**Description**

Creates a specified number of volumes in a linear disk group or virtual pool.
You must specify a base name and a size for the volumes. You can create the volumes unmapped or set their default mapping. Default mapping settings apply to all hosts, unless overridden by an explicit mapping between a host and the volume. You can later change mappings by using the `map volume` and `unmap volume` commands. By default, this command will not map the created volumes.

⚠️ **CAUTION:** Using a default mapping for a volume will allow multiple hosts to access the volume. To avoid multiple hosts mounting the volume and causing corruption, the hosts must be cooperatively managed, such as by using cluster software.

Volume sizes are aligned to 4.2 MB (4 MiB) boundaries. When a volume is created or expanded, if the resulting size would be less than 4.2 MB it will be increased to 4.2 MB; if the resulting size would be greater than 4.2 MB it will be decreased to the nearest 4.2 MB boundary.

For virtual storage, you can set the retention priority for snapshots of the volume. If automatic deletion of snapshots is enabled, the system uses the retention priority of snapshots to determine which, if any, snapshots to delete. Snapshots are considered to be eligible for deletion if they have any retention priority other than never-delete. Eligible snapshots are considered for deletion by priority and age. The oldest, lowest priority snapshots are deleted first. Snapshots that are mapped or are not leaves of a volume’s snapshot tree are not eligible for automatic deletion.

### Minimum role

Manage

### Syntax

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

### Parameters

- `access read-write|rw|read-only|ro|no-access`:
  Optional. The access permission to use for the mapping: read-write (rw), read-only (ro), or no-access. If no-access is specified, the volume is not mapped. The default is read-write.

- `baselun base-LUN`:
  Optional. The first in a sequence of LUNs to assign to map the volumes through ports specified by the `ports` parameter. If the `baselun` and `ports` parameters are omitted, the volumes are not mapped. If a LUN to be assigned to a volume is already in use, an error message is displayed and that volume and any subsequent volumes are not mapped.

- `basename base-name`:
  A name to which a number will be appended to generate a different name for each volume. Volume names must be unique system-wide. Input rules:
  - The value is case sensitive.
  - The value can have a maximum of 16 bytes.
  - The value can include spaces and printable UTF-8 characters except: " .. < \.
  - A value that includes a space must be enclosed in double quotes.

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

Alphabetical list of commands 63
count #
The number of volumes to create, from 1 to 128. Volumes will be created up to the maximum number supported per disk group.

large-virtual-extents enabled|disabled|on|off
Optional. For a virtual volume, this sets whether the system will try to allocate pages in a sequentially optimized way to reduce I/O latency in SSD applications and improve performance.

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

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

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

size size[B|KB|MB|GB|KB|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 volume size is 140 TB (128 TiB).

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.

snapshot-retention-priority never-delete|high|medium|low
Optional. For virtual storage, this specifies the retention priority for snapshots of the volume set.

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

tier-affinity no-affinity|archive|performance
Optional. For virtual storage, this specifies how to tune the tier-migration algorithm for the volume:

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

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

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

Examples

Create two unmapped, 100-GB volumes with base name MyVol- in pool B and add them to volume group MyVG.

# create volume-set count 2 size 100GB pool b basename MyVol- volume-group MyVG
Create two unmapped, 100-GB volumes with base name data- in disk group data.

```
# create volume-set count 2 size 100GB vdisk data basename data-
```

Create ten 20-GB volumes with the base name vd1_v in disk group vd1, mapped starting with LUN 5 with read-only access through port A1.

```
# create volume-set count 10 size 20GB vdisk vd1 basename vd1_v baselun 5 access ro ports a1
```

Create four 5 MB volumes with the base name BV1_ with snapshot retention priority high.

```
# create volume-set count 4 size 5MB basename BV1_ snapshot-retention-priority high volume-group Vol1
```

See also

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

delete all-snapshots

**Description**

Deletes all snapshots associated with a specified source volume.

This command applies to virtual storage only. All data associated with the snapshots is deleted and their space in the pool is freed for use.

⚠️ **CAUTION:** When the snapshots are deleted, all data in those snapshots will be lost.

This command has a confirmation prompt in interactive console mode.

**Minimum role**

manage

**Syntax**

```
delete all-snapshots
volume volume
```

**Parameters**

```
volume volume
```

The name or serial number of the source volume. A name that includes a space must be enclosed in double quotes.

**Examples**

Delete all snapshots associated with volume MV1.

```
# delete all-snapshots volume MV1
```

See also

show snapshots
show volumes

delete chap-records

**Description**

Deletes a specified CHAP record or all CHAP records. This command is permitted whether or not CHAP is enabled.
For a login request from an initiator to a storage system, the initiator is the originator and the storage system is the recipient. Because CHAP works during login, to make CHAP changes take effect you must reset any active iSCSI host links.

In a peer connection, a storage system can act as the originator or recipient of a login request. As the originator, with a valid CHAP record it can authenticate CHAP even if CHAP is disabled. This is possible because the system will supply the CHAP secret requested by its peer and the connection will be allowed.

![NOTE: Deleting CHAP records may make volumes inaccessible and the data in those volumes unavailable.](image)

**Minimum role**

manage

**Syntax**

to delete the CHAP record for a specific originator:

delte chap-records

name originator-name

to delete all CHAP records:

delte chap-records

all

**Parameters**

name originator-name

The originator name, typically in IQN format.

all

Delete all CHAP records in the database.

**Examples**

Delete the CHAP record for a specific originator.

# delete chap-records name iqn.1991-05.com.microsoft:myhost.domain

Delete all CHAP records.

# delete chap-records all

**See also**

create chap-record

set chap-record

show chap-records

show iscsi-parameters

---

**delete host-groups**

**Description**

Deletes specified host groups and optionally all hosts in those groups.

Before using the option to delete all the hosts in the groups, ensure that the hosts are unmapped.

This command has a confirmation prompt in interactive console mode.

**Minimum role**

manage

**Syntax**

delete host-groups

[delete-hosts]

host-groups |all

**Parameters**

delete-hosts

Optional. Specifies to delete all hosts in the groups. If this parameter is omitted, the host groups will be deleted but their hosts will not be deleted.

host-groups|all

Specifies either:
A comma-separated list of the names of host groups to delete. A name that includes a space must be enclosed in double quotes.

- all: Deletes all host groups.

**Examples**

Delete host group HGroup1 but not the hosts in those groups.

```
# delete host-groups HGroup1
```

Delete all host groups and the hosts in those groups.

```
# delete host-groups delete-hosts all
```

**See also**

`show host-groups`

---

### delete hosts

**Description**

Deletes specified hosts that are not in a host group. Mapped and unmapped hosts can be deleted. Deleting a host does not delete its initiators. Volume maps continue to apply to the initiators in the host that is deleted.

**Minimum role**

manage

**Syntax**

`delete hosts`

`hosts|all`

**Parameters**

`hosts|all`

Specifies either:

- A comma-separated list of the names of hosts to delete. A name that includes a space must be enclosed in double quotes.
- all: Deletes all hosts.

**Examples**

Delete hosts Host1 and Host2.

```
# delete hosts Host1,Host2
```

Delete all hosts.

```
# delete hosts all
```

**See also**

`create host`

`set host`

`set initiator`

`show host-groups`

`show initiators`

---

### delete initiator-nickname

**Description**

Deletes manually created initiators or the nicknames of discovered initiators.

Volume maps continue to apply to the initiators in the host that is deleted. If you delete the nickname of a discovered initiator, commands will show the initiator by its ID.

**Minimum role**

manage

**Syntax**

`delete initiator-nickname`

`initiator|all`

**Parameters**

`initiator|all`

Specifies either:
- The nickname or ID of the initiator to delete. A value that includes a space must be enclosed in double quotes.
- all: Deletes all manually created initiators and nicknames of discovered initiators.

**Examples**

Delete the manually created initiator named *Init1*.

```bash
# delete initiator-nickname Init1
```

Delete the nickname of discovered initiator *Init2*.

```bash
# delete initiator-nickname Init2
```

Delete all manually created initiators and nicknames of discovered initiators.

```bash
# delete initiator-nickname all
```

**See also**

- create host
- set initiator
- show initiators

---

**delete peer-connection**

**Description**

Deletes a peer connection between two storage systems.

You can run this command on either the local or remote system.

You cannot delete a peer connection if any replication sets are using it.

**Minimum role**

manage

**Syntax**

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

**Parameters**

- `local-only`
  Optional. Only use this parameter if you need to remove a peer connection when no network connection is available between the systems and you do not expect to be able to reconnect them. Do not use this parameter in normal operating conditions.

Run the command with this parameter on both systems. After the peer connection has been deleted, if you want to re-create it with new addresses, use the `create peer-connection` command.

```bash
peer-connection-ID
```

- Specifies the name or serial number of the peer connection to delete.

**Examples**

Delete the peer connection *Peer1*.

```bash
# delete peer-connection Peer1
```

**See also**

- create peer-connection
- query peer-connection
- set peer-connection
- show peer-connection

---

**delete pools**

**Description**

Deletes specified pools

⚠️ **CAUTION:** Deleting a pool will delete all the data it contains.
For linear storage, a pool and a disk group are logically equivalent. For a linear pool, if the pool contains volumes, the command will prompt for confirmation to delete the volumes. If the reply is yes, the command will unmap and delete all volumes in the pool, delete the pool and corresponding disk group, and make all the disks available. If the reply is no, the command will be canceled.

For virtual storage, a pool can contain multiple disk groups. For a virtual pool, if the pool contains volumes, the command will prompt for confirmation to delete the volumes. If the reply is yes, the command will unmap and delete all volumes in the pool, and then delete each disk group in the pool and make all the disks available. If the reply is no, the command will be canceled.

**NOTE:**
- You cannot remove the only pool from a system that is used in a peer connection, or a pool that contains a volume that is used in a replication set.
- If you delete a quarantined disk group and its missing disks are later found, the group will reappear as quarantined or offline and you must delete it again (to clear those disks).

**Minimum role** manage

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

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

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

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

## delete remote-system

**Description**
Deletes the persistent association with a remote system. This command applies to linear storage only.

**NOTE:** Remote-system connections for linear replication are not supported for virtual replication. Instead you must create peer connections.

**Minimum role** manage

**Syntax**
delete remote-system

**Parameters**
- `system`
  The name or network-port IP address of the remote system. A name that includes a space must be enclosed in double quotes.
The value can be an IPv4 address, IPv6 address, or FQDN.

Examples
Delete remote system System2.
# delete remote-system System2

See also
show remote-systems

delete replication-set

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

Minimum role
manage

Syntax
delete replication-set
[local-only]
replication-set-ID

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

Examples
Delete replication set RS1.
# delete replication-set RS1

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

delete schedule

Description
Deletes a task schedule. If you no longer want a scheduled task to occur, you can delete the schedule. When a volume or snapshot is deleted, its schedules and tasks are also deleted.
If the schedule uses a task that is not used by any other schedule, a confirmation prompt will ask whether you want to delete the schedule and the task. Reply yes to delete both, or no to delete only the schedule.
Minimum role: manage
Syntax:
```
delete schedule
[prompt yes|no]
schedule
```
Parameters:
`prompt yes|no`
Optional. For scripting, this specifies an automatic reply to confirmation prompts:
- `yes`: Allow the command to proceed.
- `no`: Cancel the command.
If this parameter is omitted, you must manually reply to prompts.
`schedule`
The name of the schedule to delete.

Examples:
Delete schedule `Sched1`.
```
# delete schedule Sched1
```

See also:
- `create schedule`
- `set schedule`
- `show schedules`

### delete snapshot

**Description**
Deletes specified snapshots. This command applies to virtual storage only.

All data uniquely associated with the snapshot is deleted and associated space in the pool is freed for use. The snapshot’s schedules are also deleted.

⚠️ **CAUTION:** When a snapshot is deleted, all data in the snapshot will be lost.

This command has a confirmation prompt in interactive console mode.

Minimum role: manage
Syntax:
```
delete snapshot
snapshots
```
Parameters:
`snapshots`
A comma-separated list of the names or serial numbers of the snapshots to delete. A name that includes a space must be enclosed in double quotes.

Examples:
Delete standard snapshots `s1, s2, and s3`.
```
# delete snapshot s1, s2, s3
```

See also:
- `delete all-snapshots`
- `show snapshots`

### delete task

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

Minimum role: manage
Syntax:
```
delete task
[prompt yes|no]
```
task

Parameters

prompt yes|no

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

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

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

Examples

Delete task Task1.

# delete task Task1

See also

create task
delete schedule
show schedules
show tasks

delete user

Description

Deletes a user account. You can delete any user except for the user you are logged in as. However, the system requires at least one CLI user with the manage role to exist. When a user is deleted, any sessions that are associated with that user name are terminated.

This command has a confirmation prompt in interactive console mode.

Minimum role

manage

Syntax

delete user

[noprompt]

name

Parameters

noprompt

Optional. Suppresses confirmation prompts. Specifying this parameter enables the command to proceed without user interaction.

name

The user to delete. Names are case-sensitive.

Examples

Delete user jsmith.

# delete user jsmith

See also

create user
show users

delete vdisks

Description

Deletes specified linear disk groups. This command applies to linear storage only.

This unmaps and deletes all volume in the disk groups and makes all the disks available.

⚠️ CAUTION: Deleting a linear disk group will delete all data it contains.
NOTE: If you delete a quarantined disk group and its missing disks are later found, the disk group will reappear as quarantined or offline and you must delete it again (to clear those disks).

Minimum role: manage

Syntax: delete vdisks
[prompt yes|no]
vdisks

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

Examples:
Delete linear disk groups VD1 and VD2.
# delete vdisks VD1,VD2

See also: create vdisk
          show vdisks

`delete volume-groups`

Description: Deletes specified volume groups and optionally all volumes in those groups.
Before using the option to delete all the volumes in the groups, ensure that the volumes are unmapped. If any volume is mapped, the command will fail and no changes will be made.

NOTE: For virtual storage, before you can delete a volume group that is in a replication set you must delete the replication set.

This command has a confirmation prompt in interactive console mode

Minimum role: manage

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

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

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

See also
- show maps
- show volume-groups

## delete volumes

### Description
Deletes specified volumes.

⚠️ **CAUTION:** Deleting a volume will delete all data it contains, and its schedules.

⚠️ **NOTE:** For virtual storage, you cannot delete a volume that is in a replication set.

This command has a confirmation prompt in interactive console mode.

### Minimum role
manage

### Syntax
delete volumes
volumes

### Parameters
volumes

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

### Examples
Delete volumes vol1 and vol2.

```
# delete volumes vol1,vol2
```

See also
- create volume
- show volumes

## dequarantine

### Description
Removes a disk group from quarantine.

⚠️ **NOTE:** For virtual storage, this command should only be used by or with direction from technical support.

Dequarantine is supported for a RAID-3, RAID-5, RAID-6, or RAID-50 disk group and operates as detailed below.

Dequarantine is not supported for a RAID-1 or RAID-10 disk group. For these RAID levels, if the missing disks become available, the disk group will be dequarantined automatically. Otherwise, some data will have been lost because data in the remaining disks will be invalid (“stale”).

⚠️ **CAUTION:** Carefully read this topic to determine whether to use the dequarantine command to manually remove a disk group from quarantine. The dequarantine command should only be used as part of the emergency procedure to attempt to recover data and is normally followed by use of the CLI trust command. If a disk group is manually dequarantined and does not have enough disks to continue operation, its status will change to OFFL and its data may or may not be recoverable through use of the trust command. It is recommended that you contact technical support for assistance in determining if the recovery procedure that makes use of the dequarantine and trust commands applies to your situation and for assistance to perform it.

Also, see the help for the trust command.

To continue operation and not go to quarantined status, a RAID-3 or RAID-5 disk group can have only one inaccessible disk, a RAID-6 disk group can have only one or two inaccessible disks, and a RAID-10 or RAID-50 disk group can have only one inaccessible disk per subgroup. For example, a 16-disk RAID-10 disk group can remain online (critical) with 8 inaccessible disks if one disk per mirror is inaccessible.

The system will automatically quarantine a disk group having a fault-tolerant RAID level if one or more of its disks becomes inaccessible, or to prevent invalid data that may exist in the controller from being written to
the disk group. Quarantine will not occur if a known-failed disk becomes inaccessible or if a disk becomes inaccessible after failover or recovery. The system will automatically quarantine an NRAID or RAID-0 disk group to prevent invalid data from being written to the disk group. If quarantine occurs because of an inaccessible disk, event 172 is logged. If quarantine occurs to prevent writing invalid data, event 485 is logged.

Examples of when quarantine can occur are:

- At system power-up, a disk group has fewer disks online than at the previous power-up. This may happen because a disk is slow to spin up or because an enclosure is not powered up. The disk group will be automatically dequarantined if the inaccessible disks come online and the disk group status becomes FTOL (fault tolerant and online), or if after 60 seconds the disk group status is QTDC or QTDN.
- During system operation, a disk group loses redundancy plus one more disk. For example, three disks are inaccessible in a RAID-6 disk group or two disks are inaccessible for other fault-tolerant RAID levels. The disk group will be automatically dequarantined if after 60 seconds the disk group status is FTOL, FTDN, or CRIT.

Quarantine isolates the disk group from host access and prevents the system from changing the disk group status to OFFL (offline). The number of inaccessible disks determines the quarantine status. From least to most severe:

- QTDN (quarantined with a down disk): The RAID-6 disk group has one inaccessible disk. The disk group is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTDC or QTDN, the disk group is automatically dequarantined.
- QTDC (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 QTDC or QTDN, the disk group is automatically dequarantined.
- QTOF (quarantined offline): The disk group is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 disk group.

When a disk group is quarantined, its disks become write-locked, its volumes become inaccessible, and it is not available to hosts until it is dequarantined. If there are interdependencies between the quarantined disk group’s volumes and volumes in other disk groups, quarantine may temporarily impact operation of those other volumes.

Depending on the operation, the length of the outage, and the settings associated with the operation, the operation may automatically resume when the disk group is dequarantined or may require manual intervention. A disk group can remain quarantined indefinitely without risk of data loss.

A disk group is dequarantined when it is brought back online, which can occur in three ways:

- If the inaccessible disks come online, making the disk group FTOL, the disk group is automatically dequarantined.
- If after 60 seconds from being quarantined the disk group is QTDC or QTDN, the disk group is automatically dequarantined. The inaccessible disks are marked as failed and the disk group status changes to CRIT (critical) or FTDN (fault tolerant with a down disk). If the inaccessible disks later come online, they are marked as LEFTOVR (leftover).
- The dequarantine command is used to manually dequarantine the disk group. If the inaccessible disks later come online, they are marked as LEFTOVR (leftover). If event 172 was logged, do not use the dequarantine command. Instead follow the event’s recommended-action text. If event 485 was logged, use the dequarantine command only as specified by the event’s recommended-action text to avoid data corruption or loss.

When a disk group is dequarantined, event 173 is logged.

A quarantined disk group can be fully recovered if the inaccessible disks are restored. Make sure that all disks are properly seated, that no disks have been inadvertently removed, and that no cables have been unplugged. Sometimes not all disks in the disk group power up. Check that all enclosures have restarted after a power failure. If these problems are found and then fixed, the disk group recovers and no data is lost.

If the inaccessible disks cannot be restored (for example, they failed), and the disk group’s status is FTDN or CRIT, and compatible spares are available to replace the inaccessible disks, reconstruction will automatically begin.

If a replacement disk (reconstruct target) is inaccessible at power up, the disk group becomes quarantined. When the disk is found, the disk group is dequarantined and reconstruction starts. If reconstruction was in process, it continues where it left off.
**NOTE:** The only commands allowed for a quarantined disk group are `dequarantine` and `delete vdisks` and `remove disk-groups`. If you delete a quarantined disk group and its inaccessible disks later come online, the disk group will reappear as quarantined or offline and you must delete it again (to clear those disks).

This command has a confirmation prompt in interactive console mode.

**Minimum role:** manage

**Syntax**

dequarantine
disk-group disk-group
vdisk vdisk

**Parameters**
disk-group disk-group The name or serial number of the disk group to remove from quarantine. A name that includes a space must be enclosed in double quotes.
vdisk vdisk The name or serial number of the linear disk group to remove from quarantine. A name that includes a space must be enclosed in double quotes.

**Examples**

After determining that linear disk group VD1 is quarantined, remove it from quarantine and re-check its status.

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

Dequarantine disk group dgB01.

```
# dequarantine disk-group dgB01
```

**See also**

- `show disk-groups`
- `show vdisks`
- `trust`

---

**exit**

**Description**

Log off and exit the CLI session.

**Minimum role:** monitor

**Syntax**

exit

---

**expand disk-group**

**Description**

 Adds disks to a disk group to expand its storage capacity.
This command applies to linear disk groups using any RAID level except NRAID and RAID 1. This command applies to virtual disk groups using ADAPT.

The new disks must be the same type as disks already in the disk group. The disks need not have consistent capacity.

ADAPT will use whatever space is available. The new disks must also be in the same tier as the disk group.

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

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

The expansion capability for each supported RAID level is:

<table>
<thead>
<tr>
<th>RAID level</th>
<th>Expansion capability</th>
<th>Maximum disks</th>
</tr>
</thead>
<tbody>
<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 (linear storage).</td>
<td>16</td>
</tr>
<tr>
<td>0</td>
<td>Cannot expand (read cache, virtual storage).</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td>Cannot expand (linear storage).</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Can add 1–4 disks at a time (linear storage).</td>
<td>16</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>50</td>
<td>Can expand the disk group one RAID-5 subgroup at a time. The added RAID-5 subgroup must contain the same number of disks as each original subgroup</td>
<td>32</td>
</tr>
<tr>
<td>ADAPT</td>
<td>Can add up to 68 disks at a time</td>
<td>128</td>
</tr>
</tbody>
</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 or expansion of user data capacity.

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

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

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

**Syntax**
expand disk-group
disks disks
[prompt yes|no]
disk-group

**Parameters**

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

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

**See also**
show disk-groups
show disks
show vdisks

---

**expand vdisk**

**Description**
Adds disks to a linear disk group to expand its storage capacity.
The new disks must be the same type as disks already in the disk group. The disks need not have consistent capacity; ADAPT will use whatever space is available.

---

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

1 **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:

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

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

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

⚠️ **NOTE:** Disk group expansion cannot be stopped and can take days to complete, depending on disk type, RAID level, and other factors.

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

**Minimum role**
manage

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

**Parameters**

disks disks

The IDs of the disks to add. For disk syntax, see Command syntax.
prompt yes|no

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

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

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

vdisk

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

**Examples**

Expand linear disk group **VD1** to include disk **1.11**.
```
# expand vdisk disks 1.11 VD1
```

Expand a RAID-10 linear disk group named **R10** to include an additional mirror pair.
```
# expand vdisk disks 2.9-10 R10
```

Expand a RAID-50 linear disk group named **R50**, which has four 3-disk subgroups, to include an additional subgroup.
```
# expand vdisk disks 2.1-2,2.5 R50
```
Add 10 disks to ADAPT disk group Data3.

# expand disk-group disks 1.1-10 Data3

See also

- show disk-groups
- show disks
- show vdisks

expand volume

Description

Expands a standard or base volume.

Volume sizes are aligned to 4.2 MB (4 MiB) boundaries. When a volume is created or expanded, if the resulting size would be less than 4.2 MB it will be increased to 4 MB; if the resulting size would be greater than 4.2 MB it will be decreased to the nearest 4.2 MB boundary.

For virtual storage, if overcommit is disabled, expansion is restricted to the space available in the pool that contains the volume. If overcommit is enabled, the volume size can exceed the physical capacity of the pool. The maximum volume size is 140 TB (128 TiB). To see whether overcommit is enabled, use the `show pools` command.

For linear storage, if insufficient space is available for expansion in the disk group, first expand the disk group by using `expand vdisk`.

You cannot expand a replication set’s secondary volume. However, for virtual storage you can expand a replication set’s primary volume, which will automatically expand its secondary volume—even if replication is in progress.

Minimum role

manage

Syntax

expand volume

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

volume

Parameters

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

Specifies either:

- The amount of space to add to the volume. The unit is optional (B represents bytes). If base 2 is in use, whether you specify a base-2 or base-10 unit, the resulting size will be in base 2. If no unit is specified, the default is 512-byte blocks.
- max: For linear storage, expand the volume to fill the available space in the disk group.

volume

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

Examples

Expand volume V1 by 100 GB.

# expand volume size 100GB V1

See also

- expand disk-group
- expand vdisk
- show volumes

fail

Description

Forces the partner controller module to crash for a non-maskable interrupt. The command causes the crash by issuing an internal kill command to the Storage Controller in the partner controller module. This might be helpful to gather debug information that is only available via a crash dump.
NOTE: Failing a controller module will reduce system redundancy and performance, and increase risk of data unavailability due to the reduced redundancy. If you are uncertain whether to use this command, contact technical support for assistance.

Minimum role: manage
Syntax: fail controller a|b
Parameters: controller a|b
Specifies whether to kill controller A or B. You cannot kill the controller on which the command is issued.
Examples: From controller A, fail controller B.
# fail controller b
See also: unfail controller

help
Description: Shows brief help for all available commands or full help for a specific command. This help topic also provides tips for using command shortcuts.
Minimum role: monitor
Syntax: To view brief descriptions of all commands that are available to the user role you logged in as, enter:
help
To view help for a command name, enter:
help command-name
To view information about the syntax for specifying parameters, disks, and so forth, enter:
help syntax
To view the information shown in this topic and in Command completion, editing, and history, enter:
help help
Examples: Show brief help for all available commands:
# help
Show full help for the show cli-parameters command:
# help show cli-parameters

map volume
Description: Maps specified volumes using settings that override the volumes’ default mapping.
When a volume is created, if no mapping settings are specified the volume is not mapped. Otherwise, those settings become its default mapping, which specifies the controller host ports and access level that all connected initiators have to the volume, and the LUN presented to all initiators to identify the volume. The default mapping’s LUN is known as the volume’s default LUN.
The map volume command creates mappings with different settings for different initiators. Optionally, you can specify the LUN, ports, and access level for a mapping. A mapping can make a volume accessible to initiators, or inaccessible to initiators (known as masking). For example, assume a volume’s default mapping allows read-only access using LUN 5. You can give one initiator read-write access using LUN 6, and you can give a second initiator no access to the volume.

⚠️ CAUTION: Using a default mapping for a volume will allow multiple hosts to access the volume. To avoid multiple hosts mounting the volume and causing corruption, the hosts must be cooperatively managed, such as by using cluster software.
NOTE:

- You cannot map a replication set’s secondary volume. Create a snapshot of the secondary volume or enable replication snapshot history and use the snapshot for mapping and accessing data.
- When mapping a volume to an initiator using the Linux ext3 file system, specify read-write access. Otherwise, the file system will be unable to mount/present/map the volume and will report an error such as “unknown partition table.”

Minimum role
manage

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

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 the access parameter is specified as read-write or read-only, the lun parameter must be specified. For an explicit mapping, no-access causes the volume to be masked from specified initiators. If the access parameter is omitted, access is set to read-write.

host hosts
Deprecated—use the initiator parameter instead.

initiator initiators|hosts|host-groups
Optional. A comma-separated list of initiators, hosts, or host groups to which to map the volumes. For initiator, host, and host-group syntax, see Command syntax. If the initiator parameter is specified, the lun and ports parameters must be specified. If the initiator parameter is omitted, the mapping applies to all initiators that are not explicitly mapped.

lun LUN
Optional. The LUN to use for the mapping. If a single volume and multiple initiators are specified, the same LUN is used for each initiator. If multiple volumes and a single initiator are specified, the LUN will increment for the second and subsequent volumes. If multiple volumes and initiators are specified, each initiator will have the same LUN for the first volume, the next LUN for the second volume, and so on. The lun parameter is ignored if access is set to no-access. If the lun parameter is omitted, the default LUN is presented.

ports ports
Optional. The controller host ports to use for the mapping. Any unspecified ports become unmapped. All specified ports must be the same type (FC, for example). For port syntax, see Command syntax. If the ports parameter is specified, the lun parameter must also be specified. The ports parameter is ignored if access is set to no-access. If the ports parameter is omitted, all ports are mapped.

volumes|volume-groups
A comma-separated list of the names or serial numbers of the volumes or volume groups to map. For volume and volume-group syntax, see Command syntax

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

```bash
# map volume ports a1,b1 lun 6 initiator Init1,Init2 vol1,vol2
```

Map volume group volGroupA to host group hostGroupA, starting with LUN 1 on ports A0 and B0.

```bash
# map volume volGroupA.* initiator hostGroupA.*.* lun 1 port A0,B0
```

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

### meta

**Description**
In API format only, shows all property metadata for objects. This includes data not shown in brief mode.

**Minimum role**
monitor

**Syntax**
`meta basetypes`

**Parameters**
`basetypes`
A basetype or a list of basetypes separated by commas (with no spaces) to specify the objects for which to show metadata. For names and descriptions of supported basetypes, see API basetype properties

**Examples**
Show all metadata for objects returned by the `show disks` command:

```bash
# meta drives
```

**See also**
- set cli-parameters

### ping

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

**Minimum role**
monitor

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

**Parameters**
`host-address`
The network address of the remote host. The value can be an IPv4 address, IPv6 address, or FQDN.

`count count`
Optional. The number of packets to send. The default is 4 packets. Use a small count because the command cannot be interrupted. The default is 4 packets.

**Examples**
Send two packets to the remote computer at 10.134.50.6.

```bash
# ping 10.134.50.6 count 2
```
query peer-connection

Description
Queries a storage system to potentially use in a peer connection and shows information about the storage system via the in-band query. The system uses this information to determine how to set up the peer connection.

You can use this command to view information about systems you might use in a peer connection before creating the peer connection, or to view information about systems currently in a peer connection before modifying the peer connection.

For example, to create a peer connection you must specify a port address on the remote system. You can specify any port address that this command shows as having Reachable Local Links values.

Minimum role
monitor

Syntax
query peer-connection
remote-port-address

Parameters
remote-port-address Specifies the FC WWN or iSCSI IP address of the system to query. IPv4 and IPv6 formats are supported.

Output
Controller
• A: Controller A.
• B: Controller B.

Storage Controller Code Version
Storage Controller firmware version and loader version.

Management Controller Code Version
Management Controller firmware version and loader version.

IPv4 Address
Controller network port IPv4 address.

Peer Host Name
Controller network port IP address in the peer system.

IPv6 Address 1-4
Up to four IPv6 addresses configured for use, or Not Configured.

Port
The port ID.

Type
• FC: FC port.
• iSCSI: iSCSI port.
• Unknown: Port type is unknown

Port Health
• Up
• Down
• Degraded
• SFP Issue
• Unknown

Port Address
The assigned port address.

Reachable Local Links
The IDs of ports in the local system linked to ports in the remote system.

Examples
Query the system with an IP address of 192.168.200.22.
release volume

Description
Clears initiator registrations and releases persistent reservations for all or specified volumes. Normally, reservations placed on volumes by initiators accessing those volumes can be released by host software. This command should be used only when the system is in an abnormal state, perhaps due to a configuration problem, and you need to remove all reservations for specified volumes and return them to a “clean” state.

⚠️ CAUTION: Releasing reservations for volumes may allow unintended access to those volumes by other initiators, which may result in data corruption. Before issuing this command, quiesce all host initiators that have visibility to the volumes whose reservations will be released.

Minimum role
manage

Syntax
release volume all|volumes

Parameters

Parameters
all|volumes Specifies all volumes, or a comma-separated list of the names or serial numbers of specific volumes. A name that includes a space must be enclosed in double quotes.

Examples
Release reservations for a specific volume.

# release volume vd04_v0002

See also
show volume-reservations
show volumes

remove disk-groups

Description
Removes specified disk groups.

⚠️ CAUTION:

- If your system gets into a state where a virtual disk group is quarantined or offline or does not have a corresponding pool, contact technical support.
- Deleting a linear disk group will delete all data it contains.

If a specified disk group has a job running, such as media scrub, the command will prompt for confirmation to stop the job.

For a linear disk group, if the group contains volumes, the command will prompt for confirmation to delete the volumes. If the reply is yes, the command will unmap and delete all volumes in the group, delete the group and corresponding pool, and make all the disks available. If the reply is no, the command will be canceled.

For a virtual disk group, if the group contains no volume data, the group will be removed. If the group contains volume data, the command will initiate removal and try to drain (move) all volume data to other groups in the same pool. While data is being drained, the group’s status will be VDRAIN. If the pool does not have enough space to contain the volume data, the command will immediately fail with an error. If draining begins and is successful, an event will be logged and the group will be removed. If draining begins but hosts continue to write new data to the volumes and cause amount-of-space condition, the command will fail and an event will be logged.
NOTE: Disk group removal (draining) can take a very long time depending on a number of factors in the system, including but not limited to: large pool configuration; the amount of I/O traffic to the system (e.g., active I/O pages to the draining disk group); the type of the disk group page migration (enterprise SAS, midline SAS, SSD); the size of the draining disk group(s) in the system; and the number of disk groups draining at the same time.

If you remove the last disk group in a virtual pool, the command will prompt for confirmation to remove the pool, too. If the reply is yes, the pool will be removed. If the reply is no, the disk group and the pool will remain.

In one command you can delete linear and virtual disk groups, and disk groups from more than one pool.

NOTE:

• You cannot remove the last disk group from the only pool in a system that is used in a peer connection, or a disk group that contains a volume that is used in a replication set.
• If you delete a quarantined disk group and its missing disks are later found, the group will reappear as quarantined or offline and you must delete it again (to clear those disks).

Minimum role
manage

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

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

Examples
Remove disk groups dg1 and dg2.
# remove disk-groups dg1,dg2

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

remove host-group-members

Description
Removes specified hosts from a host group. You cannot remove all hosts from a group. At least one host must remain. The hosts are ungrouped but not deleted.
This command has a confirmation prompt in interactive console mode.

Minimum role
manage

Syntax
remove host-group-members
hosts hosts
host-group

Parameters
hosts hosts
A comma-separated list of the names of hosts to remove from the host group. A name that includes a space must be enclosed in double quotes.
host-group
The name of the host group. A name that includes a space must be enclosed in double quotes.

Examples
Remove two hosts from a group that contains three hosts.

# remove host-group-members hosts Host2,Host3 HostGroup1

See also
delete host-groups
show host-groups
show initiators

**remove host-members**

Description
Removes specified initiators from a host. You cannot remove all initiators from a host. At least one initiator must remain. The initiators are ungrouped but not deleted.

Minimum role
manage

Syntax
remove host-members
initiators initiators
host-name

Parameters
initiators initiators
A comma-separated list of the names of initiators to remove from the host. A name that includes a space must be enclosed in double quotes.

host-name
The name of the host. A name that includes a space must be enclosed in double quotes.

Examples
Remove two initiators from a group that contains three initiators.

# remove host-members initiators FC-init2,FC-init3 FC-host11

See also
delete hosts
show initiators

**remove ipv6-address**

Description
Removes a static IPv6 address from a controller network port.

NOTE: When the set ipv6-network-parameters command's autoconfig parameter is disabled, you cannot remove the last IPv6 address.

Minimum role
manage

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

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

Examples
Remove the IPv6 address named vlan1 from controller A.
# remove ipv6-address controller a address-label vlan1

See also
add ipv6-address
set ipv6-network-parameters
show ipv6-addresses
show ipv6-network-parameters

remove spares

Description
Removes specified spares. You can remove global spares and dedicated spares (linear storage only) in the same command.

This command cannot be used to remove dedicated spares associated with a quarantined linear disk group (QTUN) that remains after upgrading from a system that supported both virtual and linear storage. Either move the disks to a system that supports linear storage or use the remove disk-groups command to remove the quarantined disk group, which will make its dedicated spares available.

Minimum role
manage

Syntax
remove spares

Parameters
disks The IDs of the spares to remove. For disk syntax, see Command syntax.

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

See also
addd spares
show disks

remove volume-group-members

Description
Removes volumes from a volume group. You cannot remove all volumes from a group. At least one volume must remain. The volumes are ungrouped but not deleted.

NOTE: This command has a confirmation prompt in interactive console mode.

For virtual storage, you cannot add a volume to a volume group that is in a replication set.

Minimum role
manage

Syntax
remove volume-group-members

volumes volume-IDs
volume-group

Parameters

volumes volume-IDs
A comma-separated list of the names or serial numbers of volumes to remove from the volume group. A name that includes a space must be enclosed in double quotes.

volume-group
The name of the volume group. A name that includes a space must be enclosed in double quotes.

Examples

Remove volumes Vol0002 and Vol0003 from volume group VolumeGroup1.

# remove volume-group-members volumes Vol0002,Vol0003 VolumeGroup1

See also
delete replication-set
delelete volume-groups
show volume-groups
show volumes

replicate

Description

Initiates replication of volumes in a replication set.
This command must be run on the replication set’s primary system.
The initial replication may take a long time because it copies the allocated pages of the primary volume to the secondary volume. Subsequent replications are generally faster because those replications only copy changes made since the last successful replication.

If a replication fails, the system suspends the replication set. The replication operation will attempt to resume if it has been more than 10 minutes since the replication set was suspended. If the operation has not succeeded after six attempts using the 10-minute interval, it will switch to trying to resume if it has been over an hour since the last attempt and the peer connection is healthy.

Minimum role

manage

Syntax

replicate
[last-snapshot]
[snapshot snapshot-ID]
replication-set-ID

Parameters

last-snapshot
Optional. Specifies to replicate the most recent snapshot of the primary volume, instead of the base volume. You cannot specify both this parameter and the snapshot parameter.

snapshot snapshot-ID
Optional. This advanced option enables you to replicate a particular snapshot of the primary volume, instead of the base volume or its most recent snapshot. You can specify the name or serial number of the snapshot to replicate. You cannot specify both this parameter and the last-snapshot parameter.

NOTE: This operation can affect the order of replication revisions, making the secondary retention set confusing to understand.

replication-set-ID
The name or serial number of the replication set to replicate.

Examples

Replicate the volumes in replication set RS1.

# replicate RS1

Replicate the most recent snapshot of volumes in replication set RS1.

# replicate last-snapshot RS1
Replicate snapshot RS1V1Snap3 in replication set RS1.

# replicate snapshot RS1V1Snap3 RS1

See also
abort replication

rescan

Description
This command forces rediscovery of disks and enclosures in the storage system.

⚠️ CAUTION: Performing a rescan will temporarily pause all I/O processes.

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

A manual rescan may be needed after system power-up to display enclosures in the proper order. Whenever you replace a drive chassis or controller chassis, perform a manual rescan to force fresh discovery of all drive enclosures connected to the controller enclosure.

A manual rescan is not needed after inserting or removing non-FDE disks because the controllers automatically detect these changes. When disks are inserted they are detected after a short delay, which allows the disks to spin up.

Minimum role
manage

Syntax
rescan

Examples
Scan for device changes and re-evaluate enclosure IDs.

# rescan

reset all-statistics

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

Minimum role
manage

Syntax
reset all-statistics

Parameters
historical
Optional. Specifies to reset historical statistics instead of live statistics. If this parameter is omitted, the command will reset live statistics instead of historical statistics.

prompt yes|no
Optional. For scripting, this specifies an automatic reply to the confirmation prompt that will appear if the historical parameter is specified:

• yes: Allow the command to proceed
• no: Cancel the command

If the historical parameter is specified and the prompt parameter is omitted, you must manually reply to the prompt. If the historical parameter is omitted, the prompt parameter has no effect. There is no confirmation prompt for live statistics.

Examples
Reset all live statistics for both controllers.

# reset all-statistics

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

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

### reset controller-statistics

#### Description
Resets performance statistics for controllers.

This command resets all controller statistics except Power On Time and Total Power On Hours.

#### Minimum role
manage

#### Syntax
reset controller-statistics
[a|b|both]

#### Parameters
a|b|both

Optional. Specifies whether to reset statistics for controller A, B, or both. If this parameter is omitted, statistics are reset for both controllers.

#### Examples
Reset statistics for both controllers.

```
# reset controller-statistics
```

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

### reset disk-error-statistics

#### Description
Resets error statistics for all or specified disks. Statistics that are reset include:

- Number of SMART events recorded
- Number of I/O timeouts accessing the disk
- Number of times the disk did not respond
- Number of attempts by the controllers to spin up the disk

#### Examples

```
reset disk-error-statistics
```
- Number of media errors (errors generated by the disk as specified by its manufacturer)
- Number of non-media errors (errors generated by the controllers or by the disk and not categorized as media errors)
- Number of block reassignments
- Number of bad blocks found

To reset other disk statistics, use the `reset disk-statistics` command.

**Minimum role**
manage

**Syntax**
```
reset disk-error-statistics
[disks]
```

**Parameters**
`disks`
Optional. The IDs of the disks for which to reset statistics. For disk syntax, see Command syntax. If this parameter is omitted, statistics are reset for all disks.

**Examples**
Reset error statistics for disks 1.1 and 2.1.
```
# reset disk-error-statistics 1.1,2.1
```

**See also**
- `reset all-statistics`
- `reset controller-statistics`
- `reset disk-group-statistics`
- `reset disk-statistics`
- `reset host-port-statistics`
- `reset pool-statistics`
- `reset vdisks-statistics`
- `reset volume-statistics`
- `show disk-statistics`
- `show disks`

---

**reset disk-group-statistics**

**Description**
Clears resettable performance statistics for specified disk groups, and resets timestamps for those statistics. This command behaves the same as the `reset vdisks-statistics` command.

**Minimum role**
manage

**Syntax**
```
reset disk-group-statistics
disk-groups
```

**Parameters**
`disk-groups`
Optional. A comma-separated list of the names or serial numbers of the disk groups for which to reset statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics are reset for all disk groups.

**Examples**
Reset statistics for disk group dg1.
```
# reset disk-group-statistics dg1
```

**See also**
- `reset all-statistics`
- `reset disk-error-statistics`
- `reset controller-statistics`
- `reset disk-statistics`
- `reset host-port-statistics`
- `reset pool-statistics`
reset vdisks-statistics
reset volume-statistics
show controller-statistics
show disk-group-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
manage

Syntax
reset disk-statistics

Examples
Reset statistics for all disks.
# reset disk-statistics

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

reset dns-management-hostname

Description
Resets each controller module's management host name to the factory default.
The factory default is: <SCSI-vendor-ID><midplane-serial-number><controller-ID>.

Minimum role
manage

Syntax
reset dns-management-hostname
[controller a|b|both]

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

Examples
Reset the domain host name for controller A.
# reset dns-management-hostname controller a

See also
clear dns-parameters
set dns-management-hostname
set dns-parameters
show dns-management-hostnames
show dns-parameters
reset host-link

Description
Resets specified controller host ports (channels).

⚠️ CAUTION: Resetting host links may cause lost connection to hosts.

For FC, you can reset a single port. For an FC host port configured to use FC-AL (loop) topology, a reset issues a loop initialization primitive (LIP).
For iSCSI, you can reset a port pair (either the first and second ports or the third and fourth ports). Resetting a host port issues a COMINIT/COMRESET sequence and might reset other ports.
This command has a confirmation prompt in interactive console mode.

Minimum role
manage

Syntax
reset host-link
ports ports

Parameters
ports ports
A controller host port ID, a comma-separated list of IDs, a hyphenated range of IDs, or a combination of these. A port ID is a controller ID and port number, and is not case sensitive. Do not mix controller IDs in a range.

Examples
Reset the host link on port A1.
# reset host-link ports A1

See also
show ports

reset host-port-statistics

Description
Resets performance statistics for controller host ports.

Minimum role
manage

Syntax
reset host-port-statistics
[ports ports]

Parameters
[ports ports]
Optional. The controller ID and port number of ports for which to reset statistics. For port syntax, see Command syntax. If this parameter is omitted, statistics are reset for all controller host ports.

Examples
Reset statistics for all controller host ports.
# reset host-port-statistics

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

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

Minimum role
manage

Syntax
reset pool-statistics
[pool]

Parameters
pool
Optional. The name or serial number of the virtual pool for which to reset statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics are reset for both pools A and B.

Examples
Reset statistics for pool A.
# reset pool-statistics A

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

reset smis-configuration

Description
Resets the SMI-S configuration files.

NOTE: This command is for use by or with direction from a service technician.

This command will reset the configuration of the SMI-S service to default settings. After running this command, any hosts registered via SMI-S will need to be registered again.

Messages are displayed when the SMI-S configuration is reset and SMI-S is restarted.

Minimum role
manage

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

Parameters
[a|b|both] Optional. The controller module containing the controller to restart. If this parameter is omitted, the command affects the controller being accessed.
[prompt yes|no]
Optional. For scripting, this specifies an automatic reply to confirmation prompts:
- yes: Allow the command to proceed.
- no: Cancel the command.

If this parameter is omitted, you must reply to prompts noprompt
Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

Output
Messages are displayed when the SMI-S configuration is reset and SMI-S is restarted.

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

See also
restore defaults

reset snapshot

Description
Replaces the data in a standard snapshot with the current data from its parent volume. The snapshot’s volume characteristics are not changed.

Any snapshot in a snapshot tree can be reset, but the data source can only be the snapshot’s immediate parent. For example, in the following snapshot tree:

Vol1
|   Vol1Snap
|   Vol1SnapSnap

you can reset Vol1Snap to Vol1, or reset Vol1SnapSnap to Vol1Snap.

The command will prompt you to unmount the snapshot from all hosts before starting the reset operation to avoid data loss.

⚠️ CAUTION: All data represented by the snapshot as it exists prior to issuing this command will be lost.

Minimum role
manage

Syntax
reset snapshot
[prompt yes|no]
snapshot

Parameters
[prompt yes|no] Optional. For scripting, this specifies an automatic reply to confirmation prompts:
• yes: Allow the command to proceed.
• no: Cancel the command.

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

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

Examples
Reset snapshot Vol1Snap.
# reset snapshot Vol1Snap

See also
show snapshots

reset vdisk-statistics

Description
Resets performance statistics for all or specified linear disk groups. This command applies to linear storage only.

Minimum role
manage

Syntax
reset vdisk-statistics
**reset vdisk-statistics**

**Parameters**

Optional. A comma-separated list of the names or serial numbers of the linear disk groups for which to reset statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics are reset for all linear disk groups.

**Examples**

Reset statistics for linear disk groups VD1 and MyVdisk.

```
# reset vdisk-statistics VD1,MyVdisk
```

**See also**

reset all-statistics
reset disk-error-statistics
reset controller-statistics
reset disk-group-statistics
reset host-port-statistics
reset pool-statistics
reset vdisks-statistics
reset volume-statistics
reset disk-statistics
show vdisk-statistics
show vdisks

**reset volume-statistics**

**Description**

Resets performance statistics for all or specified volumes.

**Minimum role**

manage

**Syntax**

```
reset volume-statistics
[volumes]
```

**Parameters**

`volumes`

Optional. A comma-separated list of the names or serial numbers of the volumes for which to reset statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics are reset for all volumes.

**Examples**

Reset statistics for volume vd1_v0001.

```
# reset volume-statistics vd1_v0001
```

**See also**

reset all-statistics
reset disk-error-statistics
reset controller-statistics
reset disk-group-statistics
reset host-port-statistics
reset pool-statistics
reset vdisks-statistics
reset volume-statistics
reset disk-statistics
show vdisk-statistics
show vdisks
**restart mc**

**Description**
Restarts the Management Controller in a controller module.

When you restart a Management Controller, communication with it is lost until it successfully restarts. If the restart fails, the partner Management Controller remains active with full ownership of operations and configuration information.

**Minimum role**
manage

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

**Parameters**
[a|b|both]
Optional. The controller module containing the controller to restart. If this parameter is omitted, the command affects the controller being accessed.

[noprompt]
Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

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

**Examples**
Restart the Management Controller in controller A, to which you are logged in.

```
# restart mc a
```

**See also**
restart sc
shutdown

---

**restart sc**

**Description**
Restarts the Storage Controller in a controller module.

When you restart a Storage Controller, it attempts to shut down with a proper failover sequence, which includes stopping all I/O operations and flushing the write cache to disk, and then the Storage Controller restarts. Restarting a Storage Controller restarts the corresponding Management Controller.

⚠️ **CAUTION:**
- Depending on the mapping configuration, restarting one Storage Controller may cause loss of access to data.
- If you restart both Storage Controllers, all hosts will lose access to the system and its data until the restart is complete. Additionally, both Management Controllers will be restarted and all users’ sessions will need to be restarted.

⚠️ **NOTE:** When a Storage Controller is restarted, live performance statistics that it recorded will be reset. Historical performance statistics are not affected. In a dual-controller system, disk statistics may be reduced but will not be reset to zero, because disk statistics are summed between the two controllers. For more information, see help for commands that show statistics.

**Minimum role**
manage

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

**Parameters**
[a|b|both]
Optional. The controller module containing the controller to restart. If this parameter is omitted, the command affects the controller being accessed.

[noprompt]

Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

Output

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

Examples

From controller A, restart the Storage Controller in controller B.

# restart sc b

Restart both Storage Controllers.

# restart sc both

See also

restart mc
shutdown

restore defaults

Description

Restores the default configuration on the controllers.

⚠️ **CAUTION:** This command is for use only with the direction from a service technician.

The `restore defaults` command restores the default settings to the controller 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 IP addresses may cause loss of access to management interfaces.

For details about which settings are restored, see [Settings changed by restore defaults](#).

Minimum role

manage

Syntax

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

Parameters

[noprompt]

Optional. Suppresses confirmation prompts. Specifying this parameter enables the command to proceed without user interaction.

[prompt yes|no]

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

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

Examples

Restore the default configuration on the controllers.

# restore defaults

See also

`reset smis-configuration`

`restart mc`

`restart sc`
resume replication-set

Description
Resumes the replication operations for the specified replication set. This command applies to virtual storage only. You can run this command on the primary system.

When a replication set is suspended, all replications in progress are paused and no new replications are allowed to start. When you run this command to resume replications, all paused replications are resumed and new replications are allowed to occur. If you aborted a replication while the replication set was suspended, the aborted replication does not resume.

Minimum role
manage

Syntax
resume replication-set
replication-set-ID

Parameters
replication-set-ID
The name or serial number of the replication set for which to suspend replication.

Examples
Resume replications in replication set RS1.

# resume replication-set RS1

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

rollback volume

Description
Replaces the data in a parent volume with the data from one of its snapshots. This reverts the volume data to its state at an earlier point in time. The volume's characteristics are not changed.

Any parent volume in a snapshot tree can be rolled back, but the data source must be a direct child snapshot. For example, in the following snapshot tree:

Vol1
|- Vol1Snap
  |- Vol1SnapSnap

you can roll back Vol1 from Vol1Snap, or roll back Vol1Snap from Vol1SnapSnap.

The command will prompt you to unmount the volume and the snapshot from all initiators before starting the rollback operation to avoid data loss.

⚠️ CAUTION: All data that differs between the parent volume and the snapshot will be lost. Create a snapshot of the parent volume as it currently exists before performing a rollback.

⚠️ NOTE: For virtual storage, you cannot exclude modified write data in a snapshot from being used in a rollback. If you will want to do that, plan ahead and take a snapshot of the original snapshot before writing to it. Make the child snapshot read-only and use it for the rollback.

Minimum role
manage

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

Parameters
[prompt yes|no]
Optional. For scripting, this specifies an automatic reply to confirmation prompts:

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

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

**snapshot**

The name or serial number of the snapshot containing the data to roll back to. A name that includes a space must be enclosed in double quotes.

**volume**
The name or serial number of the volume to roll back. A name that includes a space must be enclosed in double quotes.

**Examples**

Roll back volume `Vol1` from snapshot `Vol1Snap`.

```
# rollback volume snapshot Vol1Snap Vol1
```

**See also**

- show snapshots
- show volumes

### scrub disk-groups

**Description**

Analyzes specified disk groups to find and fix errors.

This command acts on disks in a disk group but not dedicated spares or leftover disks. The command will fix parity mismatches for ADAPT and for RAID 5 and RAID 6, as well as for linear disk groups utilizing RAID 3 and RAID 50; find but not fix mirror mismatches for RAID 1 and 10; and fix media errors for all RAID levels.

Disk-group scrub can last over an hour, depending on disk-group size, utility priority, and amount of I/O activity. However, a manual scrub performed with this command is typically faster than a background scrub enabled with the `set advanced-settings` command. You can use a disk group while it is being scrubbed. To check the progress of a disk-group scrub (VRSC) job, use the `show disk-groups` command.

When a disk-group scrub job starts, event 206 is logged. When a scrub job ends, event 207 is logged and specifies whether errors were found and whether user action is required.

**Minimum role**

manage

**Syntax**

```
scrub disk-groups
disk-groups
```

**Parameters**

disk-groups

A comma-separated list of the names or serial numbers of the disk groups to scrub. A name that includes a space must be enclosed in double quotes.

**Examples**

Start scrubbing disk group `dg1`.

```
# scrub disk-groups dg1
```

**See also**

- abort scrub
- set advanced-settings
- show disk-groups

### scrub vdisk

**Description**

Analyzes specified linear disk groups to find and fix disk errors. This command applies to linear storage only.

This command acts on disks in a linear disk group but not dedicated spares or leftover disks. This command will fix parity mismatches for RAID 3, 5, 6, and 50; find mirror mismatches for RAID 1 and 10; and fix media errors for all RAID levels.

Linear disk-group scrub can last over an hour, depending on disk-group size, utility priority, and amount of I/O activity. However, a “foreground” scrub performed with this command is typically faster than a background scrub.
scrub enabled with the set advanced-settings command. You can use a disk group while it is being scrubbed. To check the progress of a linear disk-group scrub (VRSC) job, use the show vdisks command.

When a disk-group scrub job starts, event 206 is logged. When the scrub job ends, event 207 is logged and specifies whether errors were found and whether user action is required.

**Minimum role**
manage

**Syntax**
```
scrub vdisk
vdisks
```

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

**Examples**
Start scrubbing linear disk group vd1.
```
# scrub vdisk vd1
```

**See also**
set advanced-settings
show vdisks
abort scrub (with the vdisk parameter)

---

**scrub volume**

**Description**
Analyzes specified volumes to find and fix disk errors. This command applies to linear storage only.

This command acts on the disk portions spanned by each volume, but it does not act on dedicated spares or leftover disks. This command will fix parity mismatches for RAID 3, 5, 6, and 50; find mirror mismatches for RAID 1 and 10; and fix media errors for all RAID levels.

Volume scrub can last over an hour, depending on volume size, utility priority, and amount of I/O activity. You can use a volume while it is being scrubbed. To check the progress of a volume scrub job, use the show volumes command.

**NOTE:**
Only one scrub operation can be running on a linear disk group at a time. If a manual scrub is started while a background scrub is in progress, the background scrub will terminate and will start over 24 hours after the manual scrub completes.

When a scrub is complete, event 207 is logged and specifies whether errors were found and whether user action is required.

**Minimum role**
manage

**Syntax**
```
scrub volume
volumes
```

**Parameters**
```
volumes
```
The names or serial numbers of the volumes to scrub. A name that includes a space must be enclosed in double quotes.

**Examples**
Start scrubbing volume vol1.
```
# scrub volume vol1
```

**See also**
set advanced-settings
abort scrub (with the volume parameter)
show volumes
**send support-assist-logs**

**Description**
Sends storage-system log files to the SupportAssist server. Use this command to force collection and transmittal of log data to the server, instead of waiting for the SupportAssist feature to do so automatically.

Data collected and sent includes:
- Current configuration state of the storage system
- XML API dump of the system
- Event log
- Full debug log

Data for both controllers is sent in a single zip file.

**Minimum role**
monitor

**Syntax**
`send support-assist-logs`

**Examples**
Send storage-system log files to the SupportAssist server.

```
# send support-assist-logs
```

**See also**
- `check support-assist`
- `set support-assist`
- `set support-assist-info`
- `show support-assist`

**set advanced-settings**

**Description**
Sets advanced system configuration parameters.

**Minimum role**
manage

**Syntax**
`set advanced-settings`

```
[auto-stall-recovery enabled|disabled|on|off]
[auto-write-back enabled|disabled|on|off]
[background-disk-scrub enabled|disabled|on|off]
[background-scrub enabled|disabled|on|off]
[background-scrub-interval interval]
[compact-flash-failure enabled|disabled|on|off]
[controller-failure enabled|disabled|on|off]
[dynamic-spares enabled|disabled|on|off]
[emp-poll-rate rate]
[fan-failure enabled|disabled|on|off]
[host-cache-control enabled|disabled|on|off]
[independent-cache enabled|disabled|on|off]
[large-pools enabled|disabled|on|off]
[managed-logs enabled|disabled|on|off]
[missing-lun-response notready|illegal]
[partner-firmware-upgrade enabled|disabled|on|off]
[partner-notify enabled|disabled|on|off]
[power-supply-failure enabled|disabled|on|off]
[restart-on-capi-fail enabled|disabled|on|off]
```
Parameters

auto-stall-recovery enabled|disabled|on|off
Optional. Detects situations where a controller stall is preventing I/O operations from completing, and recovers the system so that at least one controller is operational, thus avoiding data-unavailability situations. This feature focuses on failover/recovery stalls. When a stall is detected, event 531 is logged.

• disabled or off: Auto stall recovery is disabled. The system will constantly perform auto stall detection in the background but will not automatically perform recovery actions.
• enabled or on: Auto stall recovery is enabled. The system will constantly perform auto stall detection in the background and automatically perform recovery actions. This is the default.

auto-write-back enabled|disabled|on|off
Optional. Sets whether the cache mode will change from write-through to write-back when the trigger condition is cleared.

• disabled or off: Auto-write-back is disabled.
• enabled or on: Auto-write-back is enabled. This is the default.

background-disk-scrub enabled|disabled|on|off
Optional. Sets whether disks that are not in disk groups are automatically checked for disk defects to ensure system health. The interval between background disk scrub finishing and starting again is 72 hours. The first time you enable this parameter, background disk scrub will start with minimal delay. If you disable and then re-enable this parameter, background disk scrub will start 72 hours after the last background disk scrub completed.

• disabled or off: Background disk scrub is disabled. This is the default.
• enabled or on: Background disk scrub is enabled.

background-scrub enabled|disabled|on|off
Optional. Sets whether disks in disk groups are automatically checked for disk defects to ensure system health. The interval between background disk-group scrub finishing and starting again is specified by the background-scrub-interval parameter.

• disabled or off: Background disk-group scrub is disabled. This is the default.
• enabled or on: Background disk-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 360 hours. The default is 24 hours.

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

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

controller-failure enabled|disabled|on|off
Optional. Sets whether the cache policy will change from write-back to write-through when a controller fails.

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

dynamic-spares enabled|disabled|on|off

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

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

emp-poll-rate rate

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

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

fan-failure enabled|disabled|on|off

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

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

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

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

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

independent-cache enabled|disabled|on|off

Optional. Sets the cache redundancy mode for a dual-controller storage system. For the change to take effect, you must restart both Storage Controllers. You cannot enable this parameter if the partner-firmware-update parameter or the single-controller parameter is enabled.

• disabled or off: Controller failover is enabled and data in a controller’s write-back cache is mirrored to the partner controller. This is the default.
• enabled or on: The controllers use Independent Cache Performance Mode, in which controller failover is disabled and data in a controller’s write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.

large-pools enabled|disabled|on|off

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

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

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

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

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

**missing-lun-response notready|illegal**

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

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

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

Optional. Sets whether component firmware versions are monitored and will be automatically updated on the partner controller. You cannot enable this parameter if the independent-cache parameter is enabled.

- **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. The default is **disabled**.

- **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 MESM.

**single-controller**

For use by a service technician only.

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

**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.
- enabled or on: Drive spin down for available disks and global spares is enabled. If the spin-down-delay parameter is not specified, the delay will be set to 60 minutes.

**NOTE:** Drive spin down is not applicable to ADAPT disk groups or virtual pools.

spin-down-delay delay

Optional. Sets the period of inactivity after which spinning disks that are available or are global spares will spin down. Setting the delay to 1–360 minutes will enable spin down. Setting the delay to 0 will disable spin down. The default is 15 minutes.

**NOTE:** Drive spin down is not applicable to ADAPT disk groups or virtual pools.

super-cap-failure enabled|disabled|on|off

Optional. Sets whether the cache policy will change from write-back to write-through when the supercapacitor that provides backup power for cache is not fully charged or fails.

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

sync-cache-mode immediate|flush

Optional. Sets how the SCSI SYNCHRONIZE CACHE command is handled.

- immediate: Good status is returned immediately and cache content is unchanged. This option is the default.
- flush: Good status is returned only after all write-back data for the specified volume is flushed to disk.

temperature-exceeded enabled|disabled|on|off

Optional. Sets whether the system will shut down a controller when its temperature exceeds the critical operating range.

- disabled or off: The over-temperature trigger is disabled. This is the default.
- enabled or on: The over-temperature trigger is enabled.

utility-priority low|medium|high

Optional. Sets the priority at which data-redundancy utilities, such as disk-group verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect disk-group background scrub, which always runs at “background” priority.)

- high: Utilities have higher priority than host I/O. Use when your highest priority is to return the system to a fully fault-tolerant state. This can cause heavy I/O to be slower than normal. This is the default.
- medium: Utility performance is balanced with host I/O performance.
- low: Utilities run at a slower rate with minimal effect on host I/O. Use when streaming data without interruption, such as for a web server, is more important than data redundancy.

Examples

Enable partner firmware upgrade.

```
# set advanced-settings partner-firmware-upgrade enabled
```

Enable managed logs.

```
# set advanced-settings managed-logs enabled
```

Disable auto stall recovery.

```
# set advanced-settings auto-stall-recovery disabled
```

See also

- add spares
- remove spares
set chap-record

Description
Changes an iSCSI originator’s CHAP record.
You can change the record’s secret, mutual name, and mutual secret values. This command is permitted
whether or not CHAP is enabled.
For a login request from an initiator to a storage system, the initiator is the originator and the storage system
is the recipient. Because CHAP works during login, to make CHAP changes take effect you must reset any
active iSCSI host links.

**NOTE:** For information about setting up CHAP for use in a peer connection, see the topic about
creating a peer connection in MESM documentation.

Minimum role
manage

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

Parameters
name originator-name
The originator name, typically in IQN format.
secret originator-secret
The secret that the recipient uses to authenticate the originator. The secret is case sensitive and can include
12–16 bytes. The value can include spaces and printable UTF-8 characters except: *<
mutual-name recipient-name
Optional; for mutual CHAP only. The recipient name, typically in IQN format. The name is case sensitive and
can have a maximum of 223 bytes, including 0–9, lowercase a–z, hyphen, colon, and period. To determine a
storage system’s IQN, use the show ports command to view the Target ID value for an iSCSI port. This
parameter and mutual-secret must be set together.
mutual-secret recipient-secret
Optional; for mutual CHAP only. The secret that the originator uses to authenticate the recipient. The secret
is case sensitive, can include 12–16 bytes, and must differ from the originator secret. The value can include
spaces and printable UTF-8 characters except: *<
A storage system’s secret is shared by both controllers. This parameter and mutual-name must be set
together.

Examples
For mutual CHAP, add a recipient name and secret to a CHAP record.
```
# set chap-record name iqn.1991-05.com.microsoft:myhost.domain secret 123456abCDEf mutual-name iqn.1995-03.com.acme:01.storage.00c0ffd6000a mutual-secret ABCdef123456(2012-01-21 11:54:33)
```

See also
create chap-record
delete chap-records
show chap-records
show iscsi-parameters
show ports
set cli-parameters

Description
Sets options that control CLI behavior. If you are accessing the CLI through the network port, settings apply to the current CLI session only. If you are accessing the CLI through the enclosure’s CLI port, settings persist across sessions.

The base, locale, precision, temperature scale, timeout, and units settings are read from the user’s account, and can be overridden by using this command.

Minimum role
manage

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

Parameters

base 2|10

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

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

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

console|api|api-embed|ipa|json|wbi

Optional. Sets the output format:

• console: Supports interactive use of the CLI by displaying command output in easily readable format. This format automatically sizes fields according to content and adjusts content to window resizes. This is the default.
• api: Supports scripting by displaying command output in XML. All objects are displayed at the same level, related by COMP elements.
• api-embed: Alternate form of XML output which displays “child” objects embedded (indented) under “parent” objects. Enabling this option enables the brief parameter.
• ipa: Alternate form of XML output which displays as api-embed format with brief mode enabled.
• json: Standard JavaScript Object Notation (JSON) output.
• wbi: A JSON-like format used internally by the MESM.

brief enabled|disabled|on|off

Optional.

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

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

Examples

Set CLI parameters.
# set cli-parameters timeout 600 console pager off precision 2 units GB

For scripting, display XML output in api-embed format and disable paging.
# set cli-parameters api-embed pager off

For scripting, display brief XML output in api-embed format and disable paging.
# set cli-parameters api-embed pager off brief on

Set the CLI to show output in console format.
# set cli-parameters console

Set the CLI to show output in JSON format.
# set cli-parameters json

Set the CLI to use virtual management mode.
# set cli-parameters management-mode virtual

Alphabetical list of commands
set cloudiq

Description

Enables or disables the ability to use the Dell EMC CloudIQ application on a remote device to monitor, analyze, and troubleshoot the storage environment.

Minimum role

standard

Syntax

set cloudiq

[enabled|disabled|on|off]

Parameters

At least one parameter must be specified.

[enabled|on]

Enables use of the CloudIQ application. This is the default.

[disabled|off]

Disables use of the CloudIQ application

Examples

Disable use of CloudIQ.

# set cloudiq disabled

See also

show cloudiq

set support-assist

set controller-date

Description

Sets the date and time parameters for the system. You can set the date and time manually or configure the system to communicate with a Network Time Protocol (NTP) server. Alternatively, you can configure NTP by using the set ntp-parameters command.

NOTE:

- If you specify valid NTP parameters and manual date/time parameters in the same command, the NTP parameters will take precedence. If the NTP server cannot be contacted, the date and time will not be changed and no error message will be displayed. If you specify the timestamp parameter and other manual date/time parameters in the same command, the timestamp parameter will take precedence.
- If you change the time zone of the secondary system in a replication set whose primary and secondary systems are in different time zones, you must restart the system to enable management interfaces to show proper time values for replication operations.

Minimum role

manage

Syntax

To set the date and time manually:

set controller-date

date

day

hh:mm:ss

year

To set the date and time manually by specifying a timestamp:

set controller-datetime

timestamp

timezone +|-hh[:mm]
To configure use of NTP:

```bash
set controller-date
ntp enabled|disabled|on|off
ntpaddress address
timezone +/-hh[::mm]
```

**Parameters**

- `jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec`
  The month.
- `day`
  The day number (1–31).
- `hh:mm:ss`
  The hour (0–23), the minutes (0–59), and the seconds (0–59).
- `year`
  The year as a four-digit number.
- `ntp enabled|disabled|on|off`
  Enables or disables use of NTP. When NTP is enabled and the specified NTP server is available, each controller’s time is synchronized with the server. This is disabled by default.
- `ntpaddress address`
  The network address of an available NTP server. The value can be an IPv4 address, IPv6 address, or FQDN.
- `timezone +/-hh[::mm]`
  The system’s time zone as an offset in hours (-12 through +14) and optionally minutes (00–59) from Coordinated Universal Time (UTC). To specify a positive offset, the `+` is optional. To specify a negative offset, the `-` is required. The hour value can have one or two digits and can omit a leading zero. If the minutes value is specified it must have two digits. If it is omitted, the minutes value is set to 00.
- `timestamp timestamp`
  The date and time represented as the number of seconds (not counting leap seconds) that have elapsed since 1970-01-01 00:00:00 UTC. The resulting time will be in UTC, unless you also specify the `timezone` parameter.

**Examples**

Manually set the system time and date to 1:45 PM on September 22, 2011.

```bash
# set controller-date sep 22 13:45:0 2011
```

Manually set the system date and time to 4:30:50 PM on November 2, 2011 by specifying a timestamp and an offset for the Central Time zone.

```bash
# set controller-date timestamp 1320273050 timezone -6
```

Set the system to use NTP with an offset for the Mountain Time zone.

```bash
# set controller-date ntp enabled ntpaddress 69.10.36.3 timezone -7
```

Set the system to use NTP with an offset for the Bangalore, India, time zone.

```bash
# set controller-date ntp enabled ntpaddress 69.10.36.3 timezone +5:30
```

**See also**

- `set ntp-parameters`
- `show controller-date`
- `show ntp-status`

---

**set debug-log-parameters**

**Description**

Sets the types of debug messages to include in the Storage Controller debug log.

**NOTE:** This command is for use by or with direction from technical support.
Minimum role
manage

Syntax
set debug-log-parameters
message-type+=- [...] 

Parameters
message-type+=- 

One of the following message types, followed by a plus (+) to enable or a minus (-) to disable inclusion in the log:

- autotest: Auto-test debug messages. Disabled by default.
- awt: Auto-write-through cache triggers debug messages. Disabled by default.
- bkcfg: Internal configuration debug messages. Enabled by default.
- cache: Cache debug messages. Enabled by default.
- cache2: Extra cache debugging messages that may occur frequently enough to fill logs. Disabled by default.
- capi: Internal Configuration API debug messages. Enabled by default.
- capi2: Internal Configuration API verbose debug messages. Disabled by default.
- cs: Copy Services feature debug messages. Enabled by default.
- disk: Disk interface debug messages. Enabled by default.
- dms: Not used.
- fo: Failover and recovery debug messages. Enabled by default.
- fruid: FRU ID debug messages. Enabled by default.
- hb: Inter-controller heartbeat debug messages. Disabled by default.
- host: Host interface debug messages. Enabled by default.
- host2: Host/SCSI debug messages. Disabled by default.
- init: Host-port initiator mode debug messages. Disabled by default.
- ioa: I/O interface driver debug messages (standard). Enabled by default
- iob: I/O interface driver debug messages (resource counts). Disabled by default.
- ioc: I/O interface driver debug messages (upper layer, verbose). Disabled by default.
- iod: I/O interface driver debug messages (lower layer, verbose). Disabled by default.
- mem: Internal memory debug messages. Disabled by default.
- misc: Internal debug messages. Enabled by default.
- msg: Inter-controller message debug messages. Enabled by default.
- mui: Internal service interface debug messages. Enabled by default.
- ps: Paged storage debug messages. Enabled by default.
- raid: RAID debug messages. Enabled by default.
- res2: Internal debug messages. Disabled by default.
- resmgr: Reservation Manager debug messages. Disabled by default.
- rtm: Remote Target Manager debug messages. Disabled by default.

Examples
Include RAID and cache messages, exclude EMP messages, and leave other message types unchanged.

set debug-log-parameters raid+ cache+ emp- 

See also
show debug-log-parameters

set disk

Description
Performs a secure erase on a specified disk. This is called repurposing the disk, and only applies to an FDE-capable disk. This command can only be run on disks whose status is AVAIL, or UNUSABLE due to having a foreign lock key. AVAIL disks have had all disk group information removed from them. Secure erasing such disks is an extra step to make all data on the disk irretrievable. Disks that are UNUSABLE due to having a foreign lock key can be imported by using the set fde-import-key command.

NOTE: If you want to repurpose more than one disk and the drive spin down (DSD) feature is enabled, disable DSD before repurposing the disks. You can re-enable it after the disks are repurposed. For information about disabling and enabling DSD for spinning disks that are
available or are global spares, see information about the set advanced-settings command’s spin-down parameter.

Minimum role
manage

Syntax
set disk
[noprompt]
repurpose
disk

Parameters
noprompt
Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

repurpose
Specifies to secure erase the specified disk.
disk
The ID of the disk to be repurposed. Only one disk may be repurposed at a time. For disk syntax, see Command syntax.

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

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

set disk-group

Description
Changes parameters for a specified disk group.

Minimum role
manage

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

Parameters
[adapt-spare-capacity size [B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default]
Optional. For an ADAPT disk group, this specifies the target spare capacity.

- size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]: Sets the target spare capacity to a specific size. The unit is optional (B represents bytes). If no unit is specified, GiB will be used, regardless of the current base. Whichever unit is set, internally the value will be rounded down to the nearest GiB. If the value is set to 0,
the absolute minimum spare space will be used. If this parameter is omitted, the default setting will be used.

- **default**: Sets the target spare capacity to the sum of the two largest disks in the disk group, which is sufficient to fully recover fault tolerance after loss of any two disks in the group.

**name new-name**

Optional. A new name for the disk group. A name that includes a space must be enclosed in double quotes.

**owner a|b**

Optional for a linear disk group. Prohibited for a virtual disk group. Sets the new owner: controller A or B.

**CAUTION:** Before changing the owning controller for a linear disk group, you must stop host I/O to its volumes. Volume mappings are not affected.

**NOTE:** Changing ownership of a disk group while any volumes in the disk group are mapped to live hosts is not supported and may cause data loss or unavailability. All volumes in the disk group must be unmapped or attached hosts must be shut down before the ownership of a disk group is changed.

**spin-down-delay delay**

Optional for a linear disk group. Prohibited for a virtual disk group. Not applicable for ADAPT. For spinning disks in a linear disk group, this sets the period of inactivity after which the disks and dedicated spares will automatically spin down. Setting the delay to 1–360 minutes will enable spin down; setting the delay to 0 will disable spin down.

**NOTE:** Drive spin down affects disk operations as follows:

- Spun-down disks are not polled for SMART events.
- Operations requiring access to disks may be delayed while the disks are spinning back up.

**disk-group**

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

### Examples

**Rename virtual disk group dgA01 to vdg.**

```
# set disk-group name vdg dgA01
```

**Rename linear disk group dg1 to dg2 and set its spin-down delay to 10 minutes.**

```
# set disk-group name dg2 spin-down-delay 10 dg1
```

### See also

**show disk-groups**

# set disk-parameters

## Description

Sets parameters that affect disk operation. Two features controlled by these parameters are disk Self-Monitoring Analysis and Reporting Technology (SMART) and drive spin down.

- Disks equipped with SMART technology can alert the controller of impending disk failure. When SMART is enabled, the system checks for SMART events one minute after a restart and every five minutes thereafter. SMART events are recorded in the event log. Changes to the SMART setting take effect after a rescan or a controller restart.
- For spinning disks, the drive spin down feature monitors disk activity within system enclosures and spins down inactive disks, based on user-specified settings. This command sets spin-down parameters for available disks and global spares. Spin-down settings do not affect leftover disks. To set spin-down parameters for a linear disk group, use the `set vdisk` command.

## Minimum role

manage

## Syntax

```
set disk-parameters
SMART enabled|disabled|on|off|detect-only]
[spin-down enabled|disabled|on|off]
```
Parameters

smart enabled|disabled|on|off|detect-only
Optional. Sets whether SMART is enabled or disabled for disks:

- disabled or off: Disables SMART for all disks in the system and for all disks added to the system.
- enabled or on: Enables SMART for all disks in the system and for all disks added to the system. This is the default.
- detect-only: Detects but does not change the SMART setting of each disk in the system, and for each new disk added to the system.

spin-down enabled|disabled|on|off
Optional. Sets whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the spin-down-delay parameter:

- disabled or off: Drive spin down for available disks and global spares is disabled. This is the default. Disabling spin down will set the spin-down delay to 0.
- enabled or on: Drive spin down for available disks and global spares is enabled. If the spin-down-delay parameter is not specified, the delay will be set to 60 minutes.

NOTE: Drive spin down is not applicable to ADAPT disk groups or virtual pools.

spin-down-delay delay
Optional. Sets the period of inactivity after which spinning disks that are available or are global spares will spin down. Setting the delay to 1–360 minutes will enable spin down. Setting the delay to 0 will disable spin down. The default is 15 minutes.

Examples

Enable SMART and drive spin down, and set the spin-down delay to 10 minutes.

# set disk-parameters smart on spin-down on spin-down-delay 10

See also

show disk-parameters

set dns-management-hostname

Description

Sets a domain host name for each controller module to identify it for management purposes.

The controller will advertise the management host name to DNS servers. The DNS servers will in turn create and advertise a fully qualified domain name (FQDN) for the controller by appending the management host name to the DNS domain string that identifies the controller.

Minimum role

manage

Syntax

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

Parameters

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

name hostname
A host name to use for a controller. The name must differ for each controller.

- A name can have from 1 to 63 bytes.
- The value is case sensitive.
- A name must start with a letter and end with a letter or number.
- A name can include letters, numbers, or hyphens; no periods.

Setting this parameter to null will reset the host name to its default value.

Examples

Set the domain host name for controller A.

# set dns-management-hostname controller a name vlan3-ctlra
set dns-parameters

Description
Configures settings to resolve domain names using the Domain Name Service (DNS).

Configuring the storage system to communicate with a DNS server within your network will allow network changes, such as frequent IP address changes in a DHCP environment, to occur without interrupting notifications sent by the system to users.

After a reachable DNS server is configured on the system, or if DHCP is enabled and a DHCP server is reachable, a DNS server may be automatically acquired. Otherwise, you can configure an SMTP server using a name such as mysmtpserver.example.com. Further, you could configure search domain example.com and SMTP server mysmtpserver and reach the same destination.

You must use this command to configure DNS parameters before you configure email parameters in any environments where DNS will be required to resolve server names.

The priority of DNS servers and search domains is:
- User-supplied, using this command
- DHCPv6
- DHCPv4

Minimum role
manage

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

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

nameservers nameserver-IP-list
An ordered list of name server addresses that are recognized within your network to be queried by the DNS resolver. You can specify a comma-separated list containing from one to three IPv4 or IPv6 addresses. The resolver will query the network in the order prescribed by the list until reaching a valid destination address. Any valid setting is treated as enabling DNS resolution for the system.

search-domains domain-name-list
Optional. An ordered list of domain names to search when resolving host names that are configured in the storage system. You can specify a comma-separated list containing from one to three domain names, with a maximum of 255 characters per domain name. The resolver will query the network in the order prescribed by the list until finding a match.

Examples
Configure the system to query the name server at IP address 8.8.8.8, or at 8.8.6.6 if 8.8.8.8 is unsuccessful or unreachable, to resolve any SMTP server name with a domain of gmail.com, followed by google.com, and finally by yahoo.com.

# set dns-parameters nameservers 8.8.8.8,8.8.6.6 search-domains gmail.com,google.com,yahoo.com

Basetypes
controller-dns-parameters
status
set email-parameters

Description
Sets SMTP notification parameters for events and managed logs.

Minimum role
manage

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

Parameters
domain domain
The domain name that is joined with an @ symbol to the sender name to form the “from” address for remote
notification. The domain name can have a maximum of 255 bytes. Because this name is used as part of an
email address, do not include spaces. For example: MyDomain.com. If the domain name is not valid, some
email servers will not process the mail.
e-mail-list email-addresses
Enter from one to four comma-separated email addresses for recipients of event notifications. Each email
address can have a maximum of 320 bytes. The first three email addresses are used as destinations for
events.
If the managed logs feature is enabled, you can set the fourth email-address to the address of the log
collection system. For example: IT-team@MyDomain.com,,,LogCollector@MyDomain.com
[include-logs disabled|on|off]
Optional. When the managed logs feature is enabled, this option activates the “push” mode, automatically
attaching system log files to managed-logs email notifications that are sent to the log collection system. This
option is disabled by default.
n-otation-level crit|error|warn|resolved|info|none
The minimum severity for which the system should send notifications:
• crit: Sends notifications for Critical events only.
• error: Sends notifications for Error and Critical events.
• warn: Sends notifications for Warning, Error, and Critical events.
• resolved: Sends notifications for Resolved, Warning, Error, and Critical events.
• info: Sends notifications for all events.
• none: Disables email notification. This is the default. If this option is specified, no other parameters are
required and their current values are not changed.
[port port-number]
Optional. The port number to use for communication with the SMTP server. Configure this parameter only if you want to override use of standard SMTP network port 25.

security-protocol tls|ssl|none

Specifies whether to use a security protocol when communicating with the SMTP server.
- tls: Enables Transport Layer Security (TLS) authentication. The standard ports for TLS are 25 or 587.
- ssl: Enables Secure Sockets Layer (SSL) authentication. The standard port for SSL is 465.
- none: Do not use a security protocol. The standard port is 25. This setting is the system default.

[sender sender]

Optional, unless security-protocol is set to tls or ssl.

The sender name that is joined with an @ symbol to the domain name to form the “from” address for remote notification. This name provides a way to identify the system that is sending the notification. The sender name can have a maximum of 64 bytes. The value cannot include a space or: \"::<>()[\]. For example: Storage-1.

When a secure protocol is used, this sender name must correspond to the password specified by the sender-password parameter, and be a valid user on the configured SMTP server.

If this parameter is omitted, the system name is used as the sender name.

[sender-password password]

Optional. This parameter is required for a secure SMTP server (using TLS or SSL) and must correspond to the user name specified by the sender parameter. 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 IP 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.

Examples

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

# set email-parameters server 10.1.9.10 sender RAIDsystem security-protocol tls port 587 sender-password Abcd@1234 domain mydomain.com notification-level warn include-logs enabled email-list sysadmin@mydomain.com,JSmith@domain2.com,,logcollector@mydomain.com

See also

set dns-parameters
show dns-parameters
show email-parameters
test (with the email parameter)

set enclosure

Description

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

Minimum role

manage

Syntax

set enclosure
[name new-name]
[location location]
Parameters

[enclosure-number]

Optional. A new name for the enclosure. Input rules:

• The value is case sensitive.
• The value can have a maximum of 20 bytes.
• The value can include spaces and printable UTF-8 characters except: ", . < \
• A value that includes a space must be enclosed in double quotes.

[location location]
The location of the enclosure. Input rules:

• The value is case sensitive.
• The value can have a maximum of 20 bytes.
• The value can include spaces and printable UTF-8 characters except: ", . < \
• A value that includes a space must be enclosed in double quotes.

[rack-number rack-number]
The number of the rack containing the enclosure, from 0 to 255.

[rack-position rack-position]
The enclosure’s position in the rack, from 0 to 255.

Examples

Set parameters for enclosure 1.

# set enclosure 1 name Storage-5 location Lab rack-number 9 rack-position 3

See also

show enclosures

set expander-fault-isolation

Description

Temporarily disables PHY fault isolation for a specific Expander Controller.

**NOTE:** This command is for use by or with direction from technical support

By default, the Expander Controller in each I/O module performs fault-isolation analysis of SAS expander PHY statistics. When one or more error counters for a specific PHY exceed the built-in thresholds, the PHY is disabled to maintain storage system operation.

While troubleshooting a storage system problem, a service technician can use this command to temporarily disable fault isolation for a specific Expander Controller in a specific enclosure.

**NOTE:** If fault isolation is disabled, be sure to re-enable it before placing the system back into service. Serious problems can result if fault isolation is disabled and a PHY failure occurs.

Minimum role

manage

Syntax

set expander-fault-isolation

[controller a|b|both]

enabled|disabled|on|off

[encl enclosure-ID]

[wwn enclosure-wwn]

Parameters

[controller a|b|both]

Optional. The I/O module containing the Expander Controller whose setting you want to change: A, B, or both. If this parameter is omitted, the setting is changed in both I/O modules.
enabled|disabled|on|off
Specifies whether to enable or disable PHY fault isolation.

[encl enclosure-ID]
Optional. The enclosure ID of the enclosure containing the PHY. Specify either this parameter or the wwn parameter.

[wwn enclosure-wwn]
Optional. The WWN of the enclosure containing the PHY. Specify either this parameter or the encl parameter.

Examples
Disable PHY fault isolation for Expander Controller A in enclosure 1.

# set expander-fault-isolation encl 1 controller a disabled

Re-enable PHY fault isolation for Expander Controller A in enclosure 1.

# set expander-fault-isolation encl 1 controller a enabled

See also
set expander-phy
show enclosures
show expander-status

set expander-phy

Description
Disables or enables a specific PHY.

NOTE: This command is for use by or with direction from technical support.

CAUTION: Disabling PHYs can prevent access to system devices, which can cause data unavailability or data loss.

Minimum role
manage

Syntax
set expander-phy
controller a|b|both
enabled|disabled|on|off
[encl enclosure-ID]
phy phy-ID
type drive|inter-exp|sc|sc-0|sc-1|sc-p|sc-a|sca-p|sca-a|scb-a|ingress
|expander-ingress-0|expander-ingress-1|egress|expander-egress-0|expander-egress-1|
drawer0-egress|drawer1-egress|drawer2-egress
|drawer0-ingress|drawer1-ingress|drawer2-ingress|drawer0-ingress-0|drawer0-
ingress-1| drawer0-ingress-2|drawer0-egress-0|drawer0-egress-1|drawer0-
egress-2|drawer1-ingress-0| drawer1-ingress-1|drawer1-ingress-2|drawer1-
ingress-3|drawer1-egress-0|drawer1-egress-1|drawer1-egress-2| drawer2-
ingress-0|drawer2-egress-1|drawer2-egress-2| drawer2-
ingress-3|drawer2-egress-4|drawer2-egress-5
[wwn enclosure-WWN]

Parameters
controller a|b|both
The I/O module containing the PHY to enable or disable: A, B, or both.

enabled|disabled|on|off]
Whether to enable or disable the specified PHY.

[encl enclosure-ID]
Optional. The enclosure ID of the enclosure containing the PHY. Specify either this parameter or the wwn parameter.

phy phy-ID

The logical PHY number.

type drive|inter-exp|sc|sc-0|sc-1|sc-p|sc-a|sca-p|scb-p|sca-a|scb-a|ingress
|expander-ingress-0|expander-ingress-1|egress|expander-egress-0|expander-egress-1|
drawer0-egress|drawer1-egress|drawer2-egress
|drawer0-ingress|drawer1-ingress|drawer2-ingress|drawer0-ingress-0|drawer0-ingress-1|drawer0-egress-0|drawer0-egress-1|drawer0-ingress-2|drawer1-ingress-0|drawer1-ingress-1|drawer1-ingress-2|drawer1-egress-0|drawer1-egress-1|drawer2-ingress-0|drawer2-ingress-1|drawer2-ingress-2|drawer2-egress-0|drawer2-egress-1|drawer2-egress-2

The PHY type:

- drive: Drive slot PHY
- inter-exp: Inter-expander PHY
- sc: Storage Controller PHY
- sc-0: Storage Controller primary PHY
- sc-1: Storage Controller alternate PHY
- sc-p: Storage Controller primary PHY
- sc-a: Storage Controller alternate PHY
- sca-p: Storage Controller A primary PHY
- scb-p: Storage Controller B primary PHY
- sca-a: Storage Controller A alternate PHY
- scb-a: Storage Controller B alternate PHY
- ingress: Expansion port ingress PHY
- expander-ingress-0: Expansion port 0 ingress PHY
- expander-ingress-1: Expansion port 1 ingress PHY
- egress: Expansion port egress PHY
- expander-egress-0: Expansion port 0 egress PHY
- expander-egress-1: Expansion port 1 egress PHY
- drawer0-egress: Drawer 0 egress PHY
- drawer1-egress: Drawer 1 egress PHY
- drawer2-egress: Drawer 2 egress PHY
- drawer0-ingress: Drawer 0 ingress PHY
- drawer1-ingress: Drawer 1 ingress PHY
- drawer2-ingress: Drawer 2 ingress 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
- 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
- drawer2-ingress-0: Drawer 2 ingress PHY 0
- drawer2-ingress-1: Drawer 2 ingress PHY 1
- drawer2-ingress-2: Drawer 2 ingress PHY 2
- drawer2-egress-0: Drawer 2 egress PHY 0
- drawer2-egress-1: Drawer 2 egress PHY 1
- drawer2-egress-2: Drawer 2 egress PHY 2

Alphabetical list of commands
set fde-import-key

**Description**
Sets or changes the import lock key for the use of Full Disk Encryption. The import lock key is derived from the passphrase and is used to unlock secured disks that are inserted into the system from a different secure system.

**Minimum role**
manage

**Syntax**
set fde-import-key
[noprompt]
passphrase value

**Parameters**

- [noprompt]
  Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

- passphrase value
  A customer-supplied password associated with securing the system. Input rules:
  - The value is case sensitive.
  - The value can have 8–32 characters.
  - The value can include printable UTF-8 characters except: , < > \

  (Any double-quote characters in the passphrase are automatically removed.)

**Examples**
Set an import lock key in order to import locked disks from another secure system:

# set fde-import-key passphrase "Customer lock--01/10/2014"

Please re-enter the import passphrase to confirm: "Customer lock--01/10/2014"

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

**Description**
Sets or changes the lock key for the use of Full Disk Encryption. The lock key is derived from the passphrase and stored within the system.

You must retain the value of the passphrase and the lock key ID that the command returns. If you lose the passphrase, you could be locked out of your data.

When a system and its disks are in the Secured, Locked state, you must enter the passphrase for the system's lock key ID to restore access to data. Disk groups will be dequarantined, pool health will be restored, and volumes will become accessible.

**Minimum role**
manage

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

**Parameters**

- `[current-passphrase value]`
  Optional. If the system is secured, the current passphrase can be provided when using the noprompt option. The command will prompt for this current passphrase if it is not supplied.

- `[noprompt]`
  Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

- `passphrase value`
  A customer-supplied password associated with securing the system. Input rules:
  - The value is case sensitive.
  - The value can have 8–32 characters.
  - The value can include printable UTF-8 characters except: , < > \ (Any double-quote characters in the passphrase are automatically removed.)

**Examples**
Set a lock key in preparation for securing the system using FDE.
```
# set fde-lock-key passphrase "Customer lock--01/10/2014"
```

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

---

**set fde-state**

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

**Minimum role**
manage

**Syntax**
```
set fde-state [noprompt] [repurpose] [secure passphrase value]
```

Either the repurpose parameter or the secure parameter must be specified.
Parameters

[noprompt]

Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

[repurpose]

Optional. The system will be repurposed, which secure erases all disks. Before issuing the command, all data (such as volumes and disk groups) must be deleted from the disks

[secure passphrase value]

Optional. The system and all its disks will become secured, using the specified FDE system passphrase, which must have been previously configured. A value that includes a space must be enclosed in double quotes. If the disks are not all FDE-capable the command will fail, and no changes will be made.

Examples

Secure the system using Full Disk Encryption.

# set fde-state secure passphrase "Customer lock--01/10/2014"

A lost passphrase will result in unrecoverable data loss. Please re-enter the passphrase to confirm: "Customer lock--01/10/2014"

See also

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

set host

Description

Sets the name of a host and optionally the profile of the host and the initiators it contains.

Minimum role

manage

Syntax

set host

[name new-name]

[profile standard]

host-name

Parameters

[name new-name]

Optional. Changes the host’s nickname to the specified name. Input rules:

- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ", . < \n - A value that includes a space must be enclosed in double quotes.

[profile standard]

Optional. Default profile.

⚠️ CAUTION: Changing this parameter can disrupt access from connected hosts.

host-name

The current name of the host. A value that includes a space must be enclosed in double quotes.

Examples

Change the name of Host1 to MyHost and the profile to standard.

# set host name MyHost profile standard Host1

See also

show initiators
set host-group

Description
Sets the name of a host group.

Minimum role
manage

Syntax
set host-group
name new-name
host-group

Parameters
name new-name
A new name for the host group. Input rules:
- The value is case sensitive.
- The value can have a maximum of 26 bytes.
- The value can include spaces and printable UTF-8 characters except: ", . < \n
host-group
The current name of the host group. A value that includes a space must be enclosed in double quotes.

Examples
Change the name of HostGroup1 to MyHostGroup.
# set host-group name MyHostGroup HostGroup1

See also
show host-groups

set host-parameters

Description
Sets controller host-port parameters for communication with attached hosts.
Host ports can be configured as FC or iSCSI ports. FC ports support use of qualified 16-Gbit/s SFPs. You can set FC ports to auto-negotiate the link speed or to use a specific link speed. iSCSI ports support use of qualified 10-Gbit/s SFPs. iSCSI port speeds are auto-negotiated. 10GbE iSCSI host ports support use of qualified Direct Attach Copper (DAC) cables. iSCSI port speeds are auto-negotiated.

⚠️ CAUTION: Parameter changes will immediately take effect and may affect access to data. The exception is that attempting to change FC loop IDs requires restarting the controllers.

Minimum role
manage

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

Parameters

Deprecated—use the ports parameter instead

[fibre-connection-mode loop|point-to-point|auto]

Optional. For FC, sets the topology for the specified ports to:

- **loop**: Fibre Channel-Arbitrated Loop (public or private). Loop mode cannot be used with 16-Gbit/s link speed.
- **point-to-point**: Fibre Channel point-to-point. This is the default.
- **auto**: Automatically sets the mode based on the detected connection type

You must also specify the **ports** parameter.

[fibre-loop-id values]

Optional. For FC, specifies comma-separated loop ID values to request for host ports when controllers arbitrate during a LIP. Use this option if you want ports to have specific addresses, if your system checks addresses in reverse order (lowest address first), or if an application requires that specific IDs be assigned to recognize the controller. If the loop ID is changed for one port, the same ID is used for other ports in the same controller. If the ports parameter is specified, loop IDs are set based on the controllers that the ports are in. You cannot specify the same value for ports on different controllers.

- **soft** or **255**: Soft target addressing enables the LIP to determine the loop ID. Use this setting if the loop ID is permitted to change after a LIP or power cycle.
- **0–125**: Specify a hard target address if you do not want the loop ID to change after a LIP or power cycle.
  
  If the port cannot acquire the specified ID, it is assigned a soft target address

You must restart affected controllers to make loop ID changes take effect.

[default-router address]

Optional. For iSCSI IPv6 only, the default router for the port IP address. This parameter requires the **ports** parameter.

[gateway address]

Optional. For iSCSI, the port gateway address. This parameter requires the **ports** parameter.

[ip address]

Optional. For iSCSI, the port IP address. Ensure that each iSCSI host port in the storage system is assigned a different IP address. This parameter requires the **ports** parameter.

[iscsi-ip-version ipv4|ipv6]

Optional. Specifies whether to use IP version 4 (IPv4) or 6 (IPv6) for addressing controller iSCSI ports. When you change this setting, iSCSI-port address values are converted to the new format:

- **ipv4**: Lets you specify addresses in dot-decimal format, where the four octets of the address use decimal values without leading zeroes and the octets are separated by a period. For example, 10,132,2,205. The first octet may not be zero, with the exception that 0,0,0,0 can be used to disable the interface (stop I/O). This option is the default.
- **ipv6**: Lets you specify addresses using eight groups of four hexadecimal digits, where the groups are separated by a colon. All groups must be specified. For example, 0000:0000:0000:0000:0000:0000:0A90:3442

[netmask address]

Optional. For iSCSI IPv4 only, the subnet mask for the port IP address. This parameter requires the **ports** parameter.

[noprompt]
Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

[ports ports|all]

Optional. Specific host port numbers or all ports. For port syntax, see Command syntax

[prompt yes|no|expert]

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

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

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

speed 4g|8g|16g|auto

Optional. For FC, sets a forced link speed in Gbit/s or lets the speed be auto-negotiated (auto). Because a speed mismatch prevents communication between the port and host, set a speed only if you need to force the port to use a known speed for testing, or you need to specify a mutually supported speed for more than two FC devices connected in an arbitrated loop. Loop mode cannot be used with 16-Gbit/s link speed. This parameter requires the ports parameter.

Examples

On a system with FC ports, set the link speed to 8 Gbit/s for ports A1 and B1.

# set host-parameters speed 8g ports a1,b1

On a system with FC ports, set the link speed to auto for ports A1 and B1 and suppress the confirmation prompt.

# set host-parameters speed auto ports a1,b1 noprompt

On a system with iSCSI ports using IPv4 addressing, change the IP address of port A3.

# set host-parameters ip 10.134.50.6 ports a3

On a system with iSCSI ports, specify to use IPv6 addressing and change the IP address and default router for port A1.

# set host-parameters ports A1 iscsi-ip-version ipv6 ip ::8576:246a default-router ::0a0a:

See also

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

set host-port-mode

Description

Changes host-interface characteristics for host ports in a CNC controller module.

For both controller modules, all ports can be set to FC, all ports can be set to iSCSI, or the first two ports in each controller module can be set to FC and the second two ports can be set to iSCSI.

This command will immediately change the host port configuration, stop I/O, restart both controllers, and log event 236. After the controllers have restarted, you can use the set host-parameters command to configure the individual ports.

NOTE: If you change the configuration of host ports used for replication peer connections, you will have to reconfigure the peer connections.

Minimum role

manage

Syntax

set host-port-mode

[FC|iSCSI|FC-and-iSCSI]
Parameters

**Parameters**

Sets the port mode for each controller.

- **FC**: Sets all ports to FC.
- **iSCSI**: Sets all ports to iSCSI.
- **FC-and-iSCSI**: Sets the first two ports to FC and the second two ports to iSCSI.

[noprompt]

Optional. Suppresses confirmation prompts. Specifying this parameter allows the command to proceed without user interaction.

Examples

**Examples**

For both controllers, set all ports to use iSCSI protocol.

```
# set host-port-mode iSCSI
```

For both controllers, set the first two ports to use FC protocol and the second two ports to use iSCSI protocol.

```
# set host-port-mode FC-and-iSCSI
```

See also

**See also**

- set host-parameters
- show ports

## set initiator

**Description**
Sets the name of an initiator and optionally its profile.

**Minimum role**
manage

**Syntax**

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

**Parameters**

- **id initiator**
  The ID of the initiator. For FC, the ID is a WWPN.
  For SAS, the ID is a WWPN. For iSCSI, the ID is an IQN. A WWPN can include a colon between each byte but the colons will be discarded.

- **[nickname name]**
  Optional. Sets the name of the initiator to the specified name. Input rules:
  - The value is case sensitive.
  - The value can have a maximum of 32 bytes.
  - The value can include spaces and printable UTF-8 characters except: \", .< \`
  - A value that includes a space must be enclosed in double quotes.

- **[profile standard]**
  Optional. Default profile

**CAUTION:** Changing this parameter can disrupt access from connected initiators.

**Examples**

For FC initiator 21000024ff3dfed1, set its name to FC-port1 and profile to standard.

```
# set initiator id 21000024ff3dfed1 nickname FC-port1 profile standard
```

For SAS initiator 21000024ff3dfed1, set its name to SAS-port1 and profile to standard.

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

# set initiator id iqn.1991-05.com.microsoft:myhost.domain nickname iSCSI-port1 profile standard

See also

set ipv6-network-parameters

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

Minimum role
manage

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

Parameters
  [autoconfig enabled|disabled|on|off]
  Optional.
  • enabled or on: Specifies whether to use an automated method (either DHCPv6 or SLAAC, as defined by the network configuration) to automatically configure the address. This provides a single IPv6 address. If a DHCPv6 address is available, DHCPv6 will provide the interface address. If DHCPv6 cannot provide an address, the SLAAC address will be the single interface address. This is the default.
  • disabled or off: Specifies whether to use manual mode. This mode uses static IPv6 addresses set with the add ipv6-address command. To use manual mode, at least one and up to four IPv6 addresses must already be set.

NOTE: At minimum, autoconfig or gateway must be specified.

[controller a|b|both]
Optional. Specifies whether to change controller A, B, or both. If this parameter is omitted, changes affect both controllers.

[ gateway gateway ]
Optional. Specifies a gateway IP address for the port. The value must be a valid IPv6 address. The value cannot include a prefix or /prefixLength notation. The address cannot be used elsewhere in the network port configuration. All addresses share a single gateway.

Examples
For controller A, enable autoconfig and set the gateway address.

# set ipv6-network-parameters autoconfig enabled controller a gateway 001:0db8:85a3:0000:0000:8a2e:0370:1111

See also
add ipv6-address
remove ipv6-address
show ipv6-addresses
show ipv6-network-parameters

set iscsi-parameters

Description
Changes system-wide parameters for iSCSI host ports in each controller module.
**Minimum role:** manage

**Syntax**

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

**Parameters**

- **chap enabled|disabled|on|off**
  Optional. Enables or disables use of Challenge Handshake Authentication Protocol. Disabled by default. When CHAP is enabled and the storage system is the recipient of a login request from a known originator (initiator), the system will request a known secret. If the originator supplies the secret, the connection will be allowed.

- **iscsi-ip-version ipv4|ipv6**
  Optional. Specifies whether to use IP version 4 (IPv4) or 6 (IPv6) for addressing controller iSCSI ports.
  - ipv4: Lets you specify addresses in dot-decimal format, where the four octets of the address use decimal values without leading zeroes and the octets are separated by a period. For example, 10.132.2.205. This option is the default.
  - ipv6: Lets you specify addresses using eight groups of four hexadecimal digits, where the groups are separated by a colon. All groups must be specified. For example, 0000:0000:0000:0000:0000:0000:0A90:3442.

- **isns enabled|disabled|on|off**
  Optional. Enables or disables registration with a specified Internet Storage Name Service server, which provides name-to-IP-address mapping. Disabled by default.

- **isns-alt-ip iSNS-IP**
  Optional. Specifies the IP address of an alternate iSNS server, which can be on a different subnet. The default address is all zeroes.

- **isns-ip iSNS-IP**
  Optional. Specifies the IP address of an iSNS server. The default address is all zeroes.

- **jumbo-frame enabled|disabled|on|off**
  Optional. Enables or disables support for jumbo frames. Allowing for 100 bytes of overhead, a normal frame can contain a 1400-byte payload whereas a jumbo frame can contain a maximum 8900-byte payload for larger data transfers. Use of jumbo frames can succeed only if jumbo-frame support is enabled on all network components in the data path. Disabled by default.

- **speed auto|1gbps**
  Sets the host port link speed.
  - auto: Auto-negotiates the proper speed. This is the default.
  - 1gbs: Forces the speed to 1 Gbit/s, overriding a downshift that can occur during auto-negotiation with 1-Gbit/s HBAs. This setting does not apply to 10-Gbit/s HBAs.

**Examples**

For a storage system using IPv4 addressing whose host ports are connected to different subnets, enable CHAP, specify the IP address of the iSNS server on each subnet, and enable registration with either server.

```
# set iscsi-parameters chap enabled isns enabled isns-ip 10.10.10.93 isns-alt-ip 10.11.10.90
```

Specify that iSCSI ports will use IPv6 addressing.
See also

set led

**set led**

*Description*

Turns a specified device's identification LED on or off to help you locate the device. For LED descriptions, see your product's installation or FRU documentation.

*Minimum role*

manage

*Syntax*

To set a disk LED:

```bash
disk led
disk ID
enable|disable|on|off
```

To set the LEDs for an enclosure and its I/O modules:

```bash
set led
[controller a|b]
enable|disable|on|off
enclosure ID
```

*Parameters*

```bash
[controller a|b]
```

Optional; for use with the enclosure parameter. Specifies the I/O module to locate. This affects the identification LED on the I/O module and on the enclosure.

```bash
disk ID
```

Specifies the disk to locate. For disk syntax, see [Command syntax](#). This overrides the fault LED on the disk.

```bash
enable|disable|on|off
```

Specifies to turn the LED on or off.

```bash
enclosure ID
```

Specifies the enclosure to locate. This affects the identification LED on the enclosure and on each I/O module.

*Examples*

Identify disk 5 in enclosure 1.

```bash
# set led disk 1.5 on
```

Stop identifying enclosure 1.

```bash
# set led enclosure 1 off
```

Identify controller B in enclosure 1.

```bash
# set led enclosure 1 controller b on
```

---

**set network-parameters**

*Description*

Sets parameters for the network port in each controller module.

You can manually set static IPv4 or IPv6 values for a network port, or you can specify that IP values should be set automatically for a network port through communication with a Dynamic Host Configuration Protocol (DHCP) server.

The addressing mode can be set differently on each controller.
IPv4 and IPv6 can be used concurrently. This command can be used to configure use of IPv4. To configure use of IPv6, use the set ipv6-network-parameters command.

Each controller has the following factory-default IP settings:
- DHCP: disabled
- Controller A IP address: 10.0.0.2
- Controller B IP address: 10.0.0.3
- IP subnet mask: 255.255.255.0
- Gateway IP address: 10.0.0.1

When DHCP is enabled, the following initial values are set and remain set until the system is able to contact a DHCP server for new addresses.
- Controller IP addresses: 169.254.x.x (where the value of x.x is the lowest 16 bits of the controller serial number)
- IP subnet mask: 255.255.0.0
- Gateway IP address: 0.0.0.0

169.254.x.x addresses (including gateway 169.254.0.1) are on a private subnet that is reserved for unconfigured systems and the addresses are not routable. This prevents the DHCP server from reassigning the addresses and possibly causing a conflict where two controllers have the same IP address. As soon as possible, change these IP values to proper values for your network.

To switch a controller from DHCP addressing to static addressing, you must set the IP address, netmask, and gateway values.

**NOTE:** The following IP addresses are reserved for internal use by the storage system: 169.254.255.1, 169.254.255.2, 169.254.255.3, 169.254.255.4, and 127.0.0.1. Because these addresses are routable, do not use them anywhere in your network.

**Minimum role**
manage

**Syntax**

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

**Parameters**

- **[controller a|b|both]**
  Optional. For IP-related parameters, this specifies whether to change controller A, B, or both. If this parameter is omitted and both controllers are set to use DHCP or are set to use ping-broadcast, changes affect both controllers. Otherwise, if this parameter is omitted and the ip parameter, netmask parameter, or gateway parameter is set, changes affect the controller being accessed.

- **[dhcp]**
  Optional. Specifies to use DHCP to set network-port IP values for both controllers, unless one controller is specified by using the controller parameter.

- **[gateway gateway]**
  Optional. A gateway IP address for the port.

- **[ip address]**
  Optional. An IP address for the port. Specify the address in dot-decimal format, where the four octets of the address use decimal values and the octets are separated by a period; for example, 10.132.2.205. The first octet may not be zero, with the exception that 0.0.0.0 can be used to disable the interface (stop I/O). This is the default.

- **[netmask netmask]**
  Optional. An IP subnet mask for the port.

- **[ping-broadcast enabled|disabled|on|off]**
Optional. Enables the storage system to respond when a ping to a broadcast address is issued on the system’s subnet. This is disabled by default.

**Examples**

Manually set network-port IP values for each controller (disabling DHCP for both controllers, if it was enabled) using IPv4 addressing. Then enable DHCP for controller A without affecting controller B.

```
# set network-parameters ip 192.168.0.10 netmask 255.255.255.0 gateway 192.168.0.1 controller a
# set network-parameters ip 192.168.0.11 netmask 255.255.255.0 gateway 192.168.0.1 controller b
# set network-parameters dhcp controller a
```

See also

* show network-parameters

---

**set ntp-parameters**

**Description**

Sets Network Time Protocol (NTP) parameters for the system. You can manually set system date and time parameters by using the `set controller-date` command. You must specify at least one of the optional parameters for the command to succeed.

**NOTE:** If you change the time zone of the secondary system in a replication set whose primary and secondary systems are in different time zones, you must restart the system to enable management interfaces to show proper time values for replication operations.

**Minimum role**

manage

**Syntax**

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

**Parameters**

- `ntp enabled|disabled|on|off` Optional. Enables or disables use of NTP. When NTP is enabled and the specified NTP server is available, each controller’s time is synchronized with the server. This is disabled by default.

- `ntpaddress address` Optional. The network address of an available NTP server. The value can be an IPv4 address, IPv6 address, or FQDN.

- `timezone +/-hh[:mm]` Optional. The system’s time zone as an offset in hours (-12 through +14) and optionally minutes (00–59) from Coordinated Universal Time (UTC). To specify a positive offset, the ‘+’ is optional. To specify a negative offset, the ‘-’ is required. The hour value can have one or two digits and can omit a leading zero. If the minutes value is specified it must have two digits. If it is omitted, the minutes value is set to 00.

**Examples**

Set the system to use NTP with an offset for the Mountain Time zone.

```
# set ntp-parameters ntp enabled ntpaddress 69.10.36.3 timezone -7
```

Set the system to use NTP with an offset for the Bangalore, India, time zone.

```
# set ntp-parameters ntp enabled ntpaddress 69.10.36.3 timezone +5:30
```

See also

* set controller-date
  * show controller-date
  * show ntp-status
set password

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

Minimum role
manage

Syntax
set password
[password password]
[user]

Parameters
[password password]
Optional. Sets a new password for the user. Input rules:
- The value is case sensitive.
- The value can have 8-32 characters.
- The value can include spaces and printable UTF-8 characters except: " , < \
- A value that includes only printable ASCII characters must include at least one uppercase character, one lowercase character, one numeric character, and one non-alphanumeric character.

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

[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 manage.
# set password manage
Enter new password: ********
Re-enter new password: ********
Change the password for a user named ftp.
# set password ftp password Abcd%1234

See also
show users

set peer-connection

Description
Modifies a peer connection between two systems.

You can use this command to change the name of a current peer connection or to change the port address of the remote system without changing the peer connection configurations. For example, you could configure a peer connection and then move one of the peers to a different network.

You can run this command on either the local system or the remote system. You must specify the username and password of a user with the manage role on the remote system.

Changing the peer connection name will not affect the network connection so any running replications will not be interrupted.

Changing the remote port address will modify the network connection, which is permitted only if there are no active replications using the connection. Abort all replications before modifying the peer connection. Additionally, either suspend the replication set to prevent any scheduled replications from running during the operation, or make sure the network connection is offline. After you have modified the peer connection, you can resume the replication set.

Minimum role
manage

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

Parameters

Optional. A new name for the peer connection. If you specify this parameter you may not specify the remote-
port-address parameter. Input rules:

- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ", . < \`
- A value that includes a space must be enclosed in double quotes.

[remote-password password]

Optional in console format; required for API format. The password of the user specified by the remote-
username parameter. If this parameter is omitted, the command prompts you to enter and re-enter a value,
which is displayed obscured for security reasons.

[remote-port-address remote-port-address]

Optional. Specifies a new FC WWN or iSCSI IP address for the remote system. IPv4 and IPv6 formats are
supported. If you specify this parameter you may not specify the name parameter.

remote-username username

The name of a user in the remote system. This must be a user with the manage role to remotely configure or
provision that system.

peer-connection-ID

Specifies the name or serial number of the peer connection to modify.

Examples

Connect the current peer connection Peer1 to the remote system’s new IP address, 192.168.202.22,
using the credentials of remote user John.

# set peer-connection remote-port-address 192.168.202.22 remote-username
John remote-password John1234 Peer1

Rename Peer1 to PeerCon1.

# set peer-connection name PeerCon1 remote-username John remote-password
John1234 Peer1

See also

create peer-connection
delete peer-connection
query peer-connection
show peer-connection

set pool

Description

Sets parameters for a virtual pool.

Each virtual pool has three thresholds for page allocation as a percentage of pool capacity. You can set the
low and middle thresholds. The high threshold is automatically calculated based on the available capacity of
the pool minus 200 GB of reserved space.

When the low or middle threshold is exceeded, event 462 is logged with Informational severity. If the high
threshold is exceeded and the pool is not overcommitted, event 462 is logged with Informational severity. If
the high threshold is exceeded and the pool is overcommitted, event 462 is logged with Warning severity. If
the pool’s 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 set overcommit, which controls whether the pool uses thin provisioning. 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 MESM, as described in help for the Pools topic.

**Minimum role**: manage

**Syntax**

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

**Parameters**

- **[low-threshold #%]**
  
  Optional. Sets the low threshold for page allocation as a percentage of pool capacity. This value must be less than the middle-threshold value. The default low-threshold value is 25%.

- **[middle-threshold #%]**
  
  Optional. Sets the middle threshold for page allocation as a percentage of pool capacity. This value must be between the low-threshold value and the high-threshold value. The default middle-threshold value is 50%.

- **[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%.

```
# set pool low-threshold 30% A
```

For pool B, disable overcommit.

```
# set pool overcommit off B
```

**See also**

- `delete pools`
- `show pools`

---

**set prompt**

**Description**

Sets the prompt for the current CLI session. This setting does not persist beyond the current session.

**Minimum role**: manage

**Syntax**

```
set prompt
```

prompt

Parameters

prompt

The new prompt. Input rules:

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

Examples

Change the prompt from "# " to "CLI$ " and start entering a show command.

# set prompt "CLI$ ">


CLI$ show ...

set protocols

Description

Enables or disables management services and protocols. In console format, if you enable an unsecured protocol the command will prompt for confirmation.

Minimum role

manage

Syntax

set protocols

[activity enabled|disabled|on|off]
[debug enabled|disabled|on|off]
[ftp enabled|disabled|on|off]
[http enabled|disabled|on|off]
[https enabled|disabled|on|off]
[ses enabled|disabled|on|off]
[sftp enabled|disabled|on|off]
[sftp-port port]
[sip enabled|disabled|on|off]
[smis enabled|disabled|on|off]
[snmp enabled|disabled|on|off]
[ssh enabled|disabled|on|off]
[ssh-port port]
[telnet enabled|disabled|on|off]
[usmis enabled|disabled|on|off]

Parameters

[activity enabled|disabled|on|off]

Optional. Enables or disables access to the activity progress interface via HTTP port 8081. This mechanism reports whether a firmware update or partner firmware update operation is active and shows the progress through each step of the operation. In addition, when the update operation completes, status is presented indicating either the successful completion, or an error indication if the operation failed. This is disabled by default.

[debug enabled|disabled|on|off]

Optional. Enables or disables debug capabilities, including Telnet debug ports and privileged diagnostic user IDs. This is disabled by default.

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

[ftp enabled|disabled|on|off]
Optional. Enables or disables File Transfer Protocol (FTP), a secondary interface for installing firmware updates, installing security certificates and keys and downloading logs. This is enabled by default. Using SFTP is preferred.

[http enabled|disabled|on|off]

Optional. Enables or disables the standard MESM web server. This is enabled by default.

[https enabled|disabled|on|off]

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

[ses enabled|disabled|on|off]

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

[sftp enabled|disabled|on|off]

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

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

[sftp-port | port]

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

[slp enabled|disabled|on|off]

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

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

[smis enabled|disabled|on|off]

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

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

[snmp enabled|disabled|on|off]

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

[ssh enabled|disabled|on|off]

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

[ssh-port | port]

Optional. Specifies the port number to use for SSH. The default is 22.

[telnet enabled|disabled|on|off]

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

[usmis enabled|disabled|on|off]

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

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

Examples

Disable unsecure HTTP connections and enable FTP.
# set protocols http disabled ftp enabled
Enable Telnet, which is an unsecured protocol.

# set protocols telnet enabled
Set the default management mode to virtual.

# set protocols management-mode virtual
Enable SFTP and set it to use port 2020.

# set protocols sftp enabled sftp-port 2020

See also
  set cli-parameters
  show protocols

set replication-set

Description
Changes parameters for a replication set. This command applies to virtual storage only.

For a replication set with a single primary volume, you can change the name, queue policy, snapshot history, and snapshot-retention policy settings.

For a replication set with a primary volume group, you can change the name and queue policy only. Volume membership cannot change for the life of the replication set.

You can run this command on either the primary or secondary system.

Minimum role
manage

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

Parameters
[name new-name]
Optional. Specifies a new name for the replication set. Input rules:
- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ", < \
- A value that includes a space must be enclosed in double quotes. If you change this parameter while a replication is running, the replication set will be immediately renamed but the current replication will not be affected.

[queue-policy discard|queue-latest]
Optional. Specifies the action to take when a replication is running and a new replication is requested.
- discard: Discard the new replication request.
- queue-latest: Take a snapshot of the primary volume and queue the new replication request. If the queue contained an older replication request, discard that older request. A maximum of one replication can be queued. This is the default.

If you change this parameter while a replication is running, the change will affect subsequent replications but not the current replication.
NOTE: If the queue policy is queue-latest and a replication is running and another is queued, you cannot change the queue policy to discard. You must manually remove the queued replication before you can change the policy.

[snapshot-basename basename]
Optional if snapshot-history is set to disabled or off. Required if snapshot-history is set to secondary or both. Specifies a prefix to help you identify replication snapshots. Input rules:
- The value is case sensitive.
- The value can have 1-26 bytes.
- The value can include spaces and printable UTF-8 characters except: ".", "<", "\"
- A value that includes a space must be enclosed in double quotes.

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

[snapshot-count #]
Optional if snapshot-history is set to disabled or off. Required if snapshot-history is set to secondary or both.

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

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

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

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

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

[snapshot-retention-priority never-delete|high|medium|low]
Optional. For virtual storage, this specifies the retention priority for history snapshots, which is used when automatic deletion of snapshots is enabled by using the set snapshot-space command. In a snapshot tree, only leaf snapshots can be deleted automatically. Deletion based on retention priority is unrelated to deleting the oldest snapshots to maintain a snapshot count.
- never-delete: Snapshots will never be deleted automatically to make space. The oldest snapshot in the snapshot history will be deleted once the snapshot-count value has been exceeded. This is the default
- high: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted.
- medium: Snapshots can be deleted after all eligible low-priority snapshots have been deleted.
- low: Snapshots can be deleted.

If you change this parameter while a replication is running, for the current replication it will affect just the secondary snapshot. An optional primary snapshot will already be created before the change takes affect.

current-replication-set-ID

Specifies the current name or serial number of the replication set for which to change the name.

Examples

Rename the replication set Rep1 to RepSet1.
# set replication-set name RepSet1 Repl
Change replication set RepSet1's queue policy to discard a new replication request when a replication is running.

# set replication-set queue-policy discard RepSet1
For replication set RepSet1 with primary volume Data, enable snapshot history for the secondary volume only, allowing up to 10 replication snapshots with the basename repsnapData to be retained for that volume.

# set replication-set snapshot-history secondary snapshot-basename repsnapData snapshot-count 10 RepSet1

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

set schedule

Description
Changes parameters for a specified schedule. If you want to change the schedule name, create a new schedule to replace the existing one. You must specify at least one of the optional parameters for the command to succeed.

You can schedule a replication task on the primary system only.
Virtual replication tasks are not queued: if a replication task is running and the time comes for that replication task to start again, that task will be skipped, though it will be counted against the schedule's count constraint (if set).

Minimum role
manage

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

Parameters
Optional. Defines when the task will first run, and optionally when it will recur and expire. You can use a comma to separate optional conditions. Dates cannot be in the past. For times, if neither AM nor PM is specified, a 24-hour clock is used.

- start yyyy-mm-dd hh:mm [AM|PM]
  Specifies a date and a time in the future to be the first instance when the scheduled task will run, and to be the starting point for any specified recurrence.
- [every # minutes|hours|days|weeks|months|years]
  Specifies the interval at which the task will run.
  For better performance when scheduling a TakeSnapshot task that will run under heavy I/O conditions or on more than three volumes, the retention count and the schedule interval should be set to similar values. For example if the retention count is 10, then the interval should be set to 10 minutes.
  For a Replicate task, the minimum interval is 30 minutes.
- [between hh:mm [AM|PM] and hh:mm [AM|PM]]
  Constrains the time range during which the task is permitted to run. Ensure that the start time is within the specified time range.
set snapshot-space

Description
Sets the snapshot space usage as a percentage of the pool and thresholds for notification.
You can set the percent of the pool that can be used for snapshots (the snapshot space).

NOTE: If the percentage of the pool used by snapshots is higher than the percentage specified in this command, the command will fail.

You can specify a limit policy to enact when the snapshot space reaches the percentage. You can set the policy to either notify you via the event log that the percentage has been reached (in which case the system continues to take snapshots, using the general pool space), or to notify you and trigger automatic deletion of snapshots. If automatic deletion is triggered, snapshots are deleted according to their configured retention priority. Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion.

The system generates events when the percentage of snapshot space used crosses low, middle, or high thresholds. The event is generated when the percentage exceeds or drops below the threshold. You can set the percentages for the thresholds.

Minimum role
manage

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

Parameters
[high-threshold percent-of-snap-space%]
Optional. Specifies a percentage of the snapshot space for the high threshold. Enter a value from 1% to 100%. It must be greater than or equal to the middle threshold. The default is 99%. When this threshold is exceeded, event 571 is logged with Warning severity.

[limit percent-of-pool%]

Optional. Specifies the snapshot space. Enter a value from 1% to 100%. The default is 10%.

[limit-policy notify-only|delete]

Optional. Specifies the limit policy for when the percentage of the pool designated for snapshots is reached.

- notify-only: When the snapshot space is reached an event is generated and logged. This is the default.
- delete: When the snapshot space is reached an event is generated and logged and automatic deletion of snapshots occurs.

[low-threshold percent-of-snap-space%]

Optional. Specifies a percentage of the snapshot space for the low threshold. Enter a value from 1% to 100%. The default is 75%. When this threshold is exceeded, event 571 is logged with Informational severity.

[middle-threshold percent-of-snap-space%]

Optional. Specifies a percentage of the snapshot space for the middle threshold. Enter a value from 1% to 100%. It must be greater than or equal to the low threshold. The default is 90%. When this threshold is exceeded, event 571 is logged with Informational severity.

pool A|B

The pool for which to create the snapshot space usage.

Examples

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

# set snapshot-space pool A limit 15% middle-threshold 85% limit-policy delete

See also

show snapshot-space
show pools

set snmp-parameters

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

Minimum role
manage

Syntax

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

Parameters

- **add-trap-host address**: Optional. Specifies the network address of a destination host that will receive traps. The value can be an IPv4 address, IPv6 address, or FQDN. Three trap hosts can be set.

- **del-trap-host address**: Optional. Specifies the network address of a destination host to delete. The value can be an IPv4 address, IPv6 address, or FQDN.
Optional. Sets the level of trap notification:
- **crit**: Sends notifications for Critical events only.
- **error**: Sends notifications for Error and Critical events.
- **warn**: Sends notifications for Warning, Error, and Critical events.
- **resolved**: Sends notifications for Resolved, Warning, Error, and Critical events.
- **info**: Sends notifications for all events.
- **none**: All events are excluded from trap notification and traps are disabled. This is the default. However, Critical events and managed-logs events 400–402 are sent regardless of the notification setting.

**[read-community string]**
Optional. 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 spaces and printable UTF-8 characters except: " <>
- A value that includes a space must be enclosed in double quotes.

**[trap-host-list addresses]**
Optional. Replaces the current list of trap destinations. Each value can be an IPv4 address, IPv6 address, or FQDN.

**[write-community string]**
Optional. Sets a community string for write access. This string must differ from the read-community string. Input rules:
- The value is case sensitive.
- The value can have a maximum of 31 bytes.
- The value can include spaces and printable UTF-8 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.

```
# set snmp-parameters enable crit add-trap-host 172.22.4.171 read-community public
```

### See also
- set protocols
- show snmp-parameters
- test (with the snmp parameter)

## set support-assist

### Description
Sets parameters for the SupportAssist feature.

When you specify to enable this feature, the CLI will present an agreement with a confirmation prompt. The agreement allows remote monitoring of the storage system, collection of diagnostic information, and transmission of that data to a remote support server. Reply yes to enable the support service or no to leave it disabled.

After enabling the service, you can use the **set support-assist-info** command to enter customer information, and then use the **check support-assist** command to check connectivity to the SupportAssist server.

### Minimum role
manage
**Syntax**

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

**Parameters**

At least one parameter must be specified.

`maintenance-mode` [enabled|disabled|on|off]

Optional. Puts the system into maintenance mode to notify SupportAssist not to create support tickets during planned system downtime.

- enabled or on – Enables maintenance mode.
- disabled or off – Disables maintenance mode. This is the default.

**NOTE:** If you specify the `maintenance-mode` parameter, do not specify other parameters.

`[state pause|resume]`

Optional. Allows you temporarily suspend the service without disabling the feature.

- pause – Suspends transmitting data to the support server.
- resume – Resumes transmitting data to the support server from the moment the service is resumed.

`[enabled|disabled|on|off]`

Optional.

- enabled or on – Enables the SupportAssist feature.
- disabled or off – Disables the SupportAssist feature

**NOTE:** If you specify this parameter, do not specify the `maintenance-mode` parameter.

**Examples**

Enable the SupportAssist feature.

```
# set support-assist enable
```

Temporarily suspend the SupportAssist service.

```
# set support-assist state pause
```

Put the system into maintenance mode.

```
# set support-assist maintenance-mode on
```

**See also**

`check support-assist`

`send support-assist-logs`

`set support-assist-info`

`show support-assist`

---

### set support-assist-info

**Description**

Sets customer information for the SupportAssist feature.

**Minimum role**

manage

**Syntax**

```
set support-assist-info
```

```
[address-city-town value]
[address-country-territory AFG|ALA|ALB|DZA|ASM|AND|AGO|AIA|ATA|ATG|ARG|ARM|ABW|AUS|AUT|AZE|BHS|BGD|BRB|BLR|BEL|BLZ|SEN|BMU|BHR|VEN|BES|BIL|BWA|BVT|BRA|IOT|BRN|BTN|BGR|BFA|BDI|CPV|KHM|CMR|CAN|CYM|CAF|TCD|CHL|CHN|CXR|CCK|COL|COM|CIG|COK|CRI|CIV|HRV|CUB|CUW|CYP|CZE|PRK|DNK|DJI|DMA|DOM|ECU|EGY|SLV|GNQ|ERI|EST|ETH|FLK|FRO|FSM|FJI|FIN|FRA|GUF|PYF|ATF|GAB|GMB|GEO|DEU|GHA]
```
Parameters

At least one parameter must be specified.

Most parameters are self-evident and their values are case sensitive. However:

- The address-country-territory, company-country-territory, email-notifications, preferred-contact-method, preferred-email-language, and time-zone values are not case sensitive.
• The phone-number value can contain spaces and punctuation characters such as plus sign, parentheses, periods, and hyphens.
• The preferred-contact-hours parameters require time values in the format hh:mm, using a 24-hour clock. For example, 18:55.

Examples
Set contact information for the SupportAssist feature.

# set support-assist-info email-address jsmith@mycompany.com preferred-email-language en email-notifications enabled

See also
check support-assist
send support-assist-logs
set support-assist
show support-assist

set support-assist-proxy

Description
Sets parameters for the SupportAssist Proxy feature. You can enable or disable the feature and configure a proxy host and port to use for HTTP communication.

Minimum role
manage

Syntax
set support-assist-proxy

Parameters
At minimum the host and port parameters must be specified when you enable this feature the first time.

[host IP-or-name]
Optional. Specifies the IPv4 address or name of a proxy host.

[port port]
Optional. Specifies the port number to use on the proxy host.

[protocol HTTP]
Optional. Specifies the communication protocol. Only HTTP is supported.

[user proxy-user]
Optional. Specifies the proxy user name to use to access the proxy server.

[password proxy-password]
Optional. Specifies the proxy password to use to access the proxy host.

[enabled|disabled|on|off]

Examples
Enable the SupportAssist Proxy feature.

# set support-assist-proxy enable host 10.2.2.2 port 1234

See also
check support-assist-proxy
clear support-assist-proxy
set syslog-parameters

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

**Minimum role**
manage

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

**Parameters**
- **[host address]**
  Optional. The network address for the host. The value can be an IPv4 address, IPv6 address, or FQDN. If notification-level is other than none, the host parameter must be specified.
- **[host-ip address]**
  Deprecated—use the host parameter instead.
- **[host-port port-number]**
  Optional. A specific port number on the host.
- **notification-level crit|error|warn|resolved|info|none**
  The minimum severity for which the system should send notifications:
  - **crit**: Sends notifications for Critical events only.
  - **error**: Sends notifications for Error and Critical events.
  - **warn**: Sends notifications for Warning, Error, and Critical events.
  - **resolved**: Sends notifications for Resolved, Warning, Error, and Critical events.
  - **info**: Sends notifications for all events.
  - **none**: Disables syslog notification.
  If notification-level is other than none, the host parameter must be specified.

**Examples**
Set the system to send an entry to the remote server at 10.1.1.10 on port 514 when a critical event occurs.
```
# set syslog-parameters notification-level crit host 10.1.1.10 host-port
```

**See also**
- show syslog-parameters
- test

**set system**

**Description**
Sets the system’s 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 MESM, the system name appears in the browser title bar or tab.

**Input rules for each value:**
- The value is case sensitive.
- The value can have a maximum of 79 bytes.
- The value can include spaces and printable UTF-8 characters except: " <> \
- A value that includes a space must be enclosed in double quotes.

**Minimum role**
manage

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

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

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

**See also**
show system

---

**set task**

**Description**
Changes parameters for a TakeSnapshot or VolumeCopy task. For these types of tasks, you can change parameters other than name, type, or associated volumes. If you change the parameters for a running task, the changes will take effect the next time the task runs.

If you want to change parameters for a ResetSnapshot task or the name, type, or associated volumes for another type of task, create a new task to replace the existing one.

**Minimum role**
manage

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

**Parameters**
[last-snapshot]
Optional. For a Replicate task this specifies to replicate the most recent snapshot of the primary volume. This snapshot may have been created either manually or by the snapshot history feature.
[replication-set]
Optional. For a Replicate task this specifies the ID of the replication set to replicate.
[retention-count #]
Optional. For a **TakeSnapshot** task this specifies the number of snapshots created by this task to retain, from 1 to 8 if the large-pools feature is enabled, or from 1 to 16 if the large-pools feature is disabled. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted. If you reduce the retention count for a task, excess snapshots will be removed the next time the task runs.

```
[snapshot-prefix prefix]
```

Optional. For a **TakeSnapshot** task this specifies a label to identify snapshots created by this task. Input rules:
- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ", < \
- A value that includes a space must be enclosed in double quotes.

```
name
```

The name of the task to change. Input rules:
- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ", < \
- A value that includes a space must be enclosed in double quotes.

### Examples
Change parameters for a **TakeSnapshot**-type task named Snap.
```bash
# set task snapshot-prefix VDlv1 retention-count 2 Snap
```

### See also
- create task
- delete task
- set schedule
- show schedules
- show tasks

---

### set user

#### Description
Changes user preferences for the session or permanently. The system requires at least one CLI user with the manage role to exist.

A user with the manage role can change any parameter except name. A user with the monitor role can change any parameter for that user except name, roles, and interfaces.

**NOTE:** User changes take effect when the user next logs in.

#### Minimum role
monitor

#### Syntax
```
set user
[authentication-type MD5|SHA|none]
[base 2|10]
[interfaces interfaces]
[locale English|en|Spanish|es|French|fr|German|de|Japanese|ja|Korean|ko|nl|
 Chinese-simplified|zh-s|zh-t]
[password password]
[precision #]
[privacy-password encryption-password]
[privacy-type DES|AES|none]
[roles roles]
[session-preferences]
```
Parameters

[authentication-type MD5|SHA|none]

Optional. For an SNMPv3 user, this specifies whether to use a security authentication protocol. This parameter requires the password parameter and, for the snmptarget interface, the trap-host parameter.
- MD5: MD5 authentication. This is the default.
- SHA: SHA-1 authentication.
- none: No authentication.

[base 2|10]

Optional. Sets the base for entry and display of storage-space sizes:
- 2: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude. In base 2 when you set a size, whether you specify a base-2 or base-10 size unit, the resulting size will be in base 2.
- 10: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. This is the default. In base 10 when you set a size, the resulting size will be in the specified unit. This option is the default.

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

[interfaces interfaces]

Optional. Specifies the interfaces that the user can access. Multiple values must be separated by commas and no spaces. A command that specifies snmpuser or snmptarget cannot also specify a non-SNMP interface.
- cli: Command-line interface. This is enabled by default.
- wbi: Web-browser interface (the MESM). This is enabled by default.
- ftp: FTP or SFTP interface.
- smis: Storage Management Initiative Specification (SMI-S) interface.
- snmpuser: Allows an SNMPv3 user to view the SNMP MIB.
- snmptarget: Allows an SNMPv3 user to receive SNMP trap notifications. This option requires the trap-host parameter.
- none: No interfaces.

To enable or disable protocols that can be used to access interfaces, use the set protocols command.

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

Optional. The display language. The default is English.

[password password]

Optional in console format; required for API format. Input rules:
- The value is case sensitive.
- The value can have 8–32 characters.
- The value can include spaces and printable UTF-8 characters except: ", < >\".
- A value that includes only printable ASCII characters must include at least one uppercase character, one lowercase character, one numeric character, and one non-alphanumeric character.
- For an SNMPv3 user whose authentication-type parameter is set to use authentication, this specifies the authentication password.
[precision #]
Optional. Sets the number of decimal places (1–10) for display of storage-space sizes. The default is 1.

[privacy-password encryption-password]
Optional. For an SNMPv3 user whose privacy-type parameter is set to use encryption, this specifies the encryption password. The value is case sensitive and must contain 8–32 characters. A password cannot contain the following characters: angle brackets, backslash, comma, double quote, single quote, or space. 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.
- none: No encryption. This is the default.

[roles roles]
Optional. Specifies the user’s roles as one or more of the following values:

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

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

[session-preferences]
Optional. Specifies that the current CLI settings will become permanent settings for the user. This parameter cannot be combined with any other parameter.

[storage-size-base 2|10]
Optional. Alias for base.

[storage-size-precision #]
Optional. Alias for precision.

[storage-size-units auto|MB|GB|TB]
Optional. Alias for units.

[temperature-scale celsius|c|fahrenheit|f]
Optional. Sets the scale for display of temperature values:

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

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

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

[type novice|standard|advanced|diagnostic]
Optional. Identifies the user’s experience level. This parameter is informational only and does not affect access to commands. The default is standard.

[units auto|MB|GB|TB]
Optional. Sets the unit for display of storage-space sizes:

- auto: Sizes are shown in units determined by the system. This is the default.
• MB: Sizes are shown in megabytes.
• GB: Sizes are shown in gigabytes.
• TB: Sizes are shown in terabytes.

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

name

Specifies the user account to change. A name that includes a space must be enclosed in double quotes.

Examples

Change the temperature scale and accessible interfaces for user jsmith.

# set user jsmith temperature-scale f interfaces wbi,cli

Change the password for user J Doe.

# set user J Doe password Abcd%1234

Change the authentication type for SNMPv3 user Traps.

# set user Traps authentication-type SHA password Snmp3%Trap

See also

set password
show users

set vdisk

Description

Changes parameters for a specified linear disk group. This command applies to linear storage only.

Minimum role

manage

Syntax

set vdisk

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

Parameters

[adapt-spare-capacity size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]|default]

Optional. For an ADAPT disk group, this specifies the target spare capacity.

• size [B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]: Sets the target spare capacity to a specific size. The unit is optional (B represents bytes). If no unit is specified, GiB will be used, regardless of the current base. Whichever unit is set, internally the value will be rounded down to the nearest GiB. If the value is set to 0, the absolute minimum spare space will be used. If this parameter is omitted, the default setting will be used.
• default: Sets the target spare capacity to the sum of the two largest disks in the disk group, which is sufficient to fully recover fault tolerance after loss of any two disks in the group.

[name new-name]

Optional. A new name for the disk group. A name that includes a space must be enclosed in double quotes.

[owner a|b]

Optional. The new owner: controller A or B.

⚠️ CAUTION: Before changing the owning controller for a disk group, you must stop host I/O to the disk group’s volumes. Volume mappings are not affected.

⚠️ NOTE: Changing ownership of a disk group while any volumes in the disk group are mapped to live hosts is not supported and may cause data loss or unavailability. All volumes in the disk
group must be unmapped or attached hosts must be shut down before the ownership of a disk
group is changed.

[spin-down-delay delay]
Optional. For spinning disks in non-ADAPT disk groups, this sets the period of inactivity after which the disk
group’s disks and dedicated spares will automatically spin down. Setting the delay to 1–360 minutes will
enable spin down. Setting the delay to 0 will disable spin down
• Spin-down disks are not polled for SMART events.
• Operations requiring access to disks may be delayed while the disks are spinning back up.

vdisk
The name or serial number of the linear disk group to change. Input rules:
• The value is case sensitive.
• The value can have a maximum of 32 bytes.
• The value can include spaces and printable UTF-8 characters except: ",< \n• A value that includes a space must be enclosed in double quotes.

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

See also
show vdisks

set volume

Description
Changes parameters for a volume.

⚠️ CAUTION: Applying new parameters may disrupt access from connected hosts.

For virtual storage, you can set the retention priority for snapshots of the volume. If automatic deletion of
snapshots is enabled, snapshots will be considered for automatic deletion first by priority and then by date, so
the oldest low-priority snapshot will be deleted first. A snapshot is eligible for deletion if all the following are
true:
• The snapshot has a retention priority other than never-delete.
• The snapshot has no child snapshots.
• The snapshot is not mapped to a host.

⚠️ NOTE: For virtual storage, changing the retention priority for a volume does not change the
retention priority for existing child snapshots.

Minimum role
manage

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

Parameters
[identifying-information description]

Optional. A description of the volume to help a host-side user identify it. Input rules:
• The value is case sensitive.
• The value can have a maximum of 127 bytes.
• The value can include spaces and printable UTF-8 characters except: < \n• A value that includes a space must be enclosed in double quotes.
[large-virtual-extents enabled|disabled|on|off]
Optional. For a virtual volume, this sets whether the system will try to allocate pages in a sequentially optimized way to reduce I/O latency in SSD applications and improve performance.

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

[name new-name]

Optional. A new name for the volume. Input rules:

- The value is case sensitive.
- The value can have a maximum of 32 bytes.
- The value can include spaces and printable UTF-8 characters except: ", < \
- A value that includes a space must be enclosed in double quotes.

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

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

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

[tier-affinity no-affinity|archive|performance]

Optional. For virtual storage, this specifies how to tune the tier-migration algorithm for the volume. The tier-affinity setting affects all members of a snapshot tree.

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

(volume)

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

Examples

Rename volume Vol1 to Vol2.

```
# set volume name Vol2 Vol1
```

Set identifying information for Vol3.

```
# set volume identifying-information "Project X data" Vol3
```

Set volume OldFiles to have affinity for the Archive tier.

```
# set volume tier-affinity archive OldFiles
```

Change the snapshot retention priority for Vol1 to low.

```
# set volume snapshot-retention-priority low Vol1
```

See also

- `show maps`
- `show volumes`

set volume-cache-parameters

Description

Sets cache options for a specified volume or specified volumes.

**NOTE:** Only change the read-ahead cache settings if you fully understand how the host operating system, application, and adapter move data so that you can adjust the settings.
accordingly. Be prepared to monitor system performance and adjust read-ahead size until you find the optimal size for your application.

⚠️ **CAUTION:** Changing the cache optimization setting while I/O is active can cause data corruption or loss. Before changing this setting, quiesce I/O from all initiators.

### Minimum role
manage

### Syntax

```
set volume-cache-parameters
[optimization standard|no-mirror]
[read-ahead-size disabled|adaptive|stripe|512KB|1MB|2MB|4MB|8MB|16MB|32MB]
[write-policy write-back|write-through|wb|wt]
volume |all
```

### Parameters

- **[optimization standard|no-mirror]**
  - Optional. Sets the cache optimization mode:
    - **standard**: This controller cache mode of operation is optimized for sequential and random I/O and is the optimization of choice for most workloads. In this mode, the cache is kept coherent with the partner controller. This mode gives you high performance and high redundancy. This is the default.
    - **no-mirror**: In this mode of operation, the controller cache performs the same as the standard mode with the exception that the cache metadata is not mirrored to the partner. While this improves the response time of write I/O, it comes at the cost of redundancy. If this option is used, the user can expect higher write performance but is exposed to data loss if a controller fails.

- **[read-ahead-size disabled|adaptive|stripe|512KB|1MB|2MB|4MB|8MB|16MB|32MB]**
  - Optional. Controls the use and size of read-ahead cache. You can optimize a volume for sequential reads or streaming data by changing the amount of data read in advance. Read ahead is triggered by sequential accesses to consecutive logical block address (LBA) ranges. Read ahead can be forward (increasing LBAs) or reverse (decreasing LBAs).

  Increasing the read-ahead size can greatly improve performance for multiple sequential read streams. However, increasing read-ahead size will likely decrease random read performance.

  - **disabled**: Disables read ahead.
  - **adaptive**: Enables adaptive read-ahead, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload. This is the default.
  - **stripe**: Sets the read-ahead size to one stripe. The controllers treat NRAID and RAID-1 disk groups internally as if they have a stripe size of 512 KB, even though they are not striped.
  - **512KB, 1MB, 2MB, 4MB, 8MB, 16MB, or 32MB**: Sets a specific read-ahead size.

- **[write-policy write-back|write-through|wb|wt]**
  - Optional. Sets the cache write policy, which determines when cached data is written to the disks. The ability to hold data in cache while it is being written to disk can increase storage device speed during sequential reads.

  - **write-back or wb**: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput. This is the default.
  - **write-through or wt**: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance.

You can configure the write policy to automatically change from write-back to write-through when certain environmental events occur, such as a fan failure. For details, see help for the `set advanced-settings` command.

```
volume
```

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

```
volume |all
```

Specifies either:
- The name or serial number of the volume to change. A name that includes a space must be enclosed in double quotes.
- all: Apply the changes to all volumes.

**Examples**
Set the cache policy, optimization mode, and read-ahead size for volume V1.

```bash
# set volume-cache-parameters write-policy wb optimization standard read-ahead-size stripe V1
```

**See also**
show cache-parameters
show volumes

### set volume-group

**Description**
Sets the name of a volume group.

**NOTE:** You cannot rename a volume group that is in a replication set.

**Minimum role**
manage

**Syntax**
set volume-group

**Parameters**
- name new-name
- volume-group

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.

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.

```bash
# set volume-group name MyVGroup VGroup1
```

**See also**
show volume-groups

### show advanced-settings

**Description**
Shows the settings for advanced system-configuration parameters.

**Minimum role**
monitor

**Syntax**
show advanced-settings

**Output**
- **Disk Group Background Scrub (v3)**
  Shows whether disks in disk groups are automatically checked for disk defects to ensure system health. The interval between a scrub finishing and starting again is specified by the **Disk Group Background Scrub Interval** field.
  - disabled: Background disk scrub is disabled.
  - enabled: Background disk scrub is enabled.

- **Vdisk Background Scrub (v2)**
  Shows whether disks in disk groups are automatically checked for disk defects to ensure system health. The interval between a scrub finishing and starting again is specified by the **Vdisk Background Scrub Interval** field.
- **disabled**: Background disk scrub is disabled.
- **enabled**: Background disk scrub is enabled.

**Disk Group Background Scrub Interval (v3)**

Shows the interval between background disk-group scrub finishing and starting again, from 0 to 360 hours.

**Vdisk Background Scrub Interval (v2)**

Shows the interval between background disk-group scrub finishing and starting again, from 0 to 360 hours.

**Partner Firmware Upgrade**

Shows whether component firmware versions are monitored and will be automatically updated on the partner controller.
- **disabled**: Partner firmware upgrade is disabled.
- **enabled**: Partner firmware upgrade is enabled. This is the default.

**Utility Priority**

Priority at which data-redundancy utilities, such as disk-group verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect disk-group background scrub, which always runs at “background” priority.)
- **high**: Utilities have higher priority than host I/O. Use when your highest priority is to return the system to a fully fault-tolerant state. This can cause heavy I/O to be slower than normal.
- **medium**: Utility performance is balanced with host I/O performance.
- **low**: Utilities run at a slower rate with minimal effect on host I/O.

**SMART**

Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks.
- **detect-only**: Each disk in the system retains its individual SMART setting, as will new disks added to the system.
- **enabled**: SMART is enabled for all disks in the system and will be enabled for new disks added to the system.
- **disabled**: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.

**Dynamic Spare Configuration**

Shows whether the storage system will automatically use a compatible disk as a spare to replace a failed disk in a disk group if no compatible spare is available.
- **disabled**: The dynamic spares feature is disabled.
- **enabled**: The dynamic spares feature is enabled.

**Enclosure Polling Rate**

Shows the interval in seconds at which the storage system will poll each enclosure’s Enclosure Management Processor (EMP) for status changes, from 5 to 3600 seconds.

**host cache control**

Shows whether hosts are allowed to use the SCSI MODE SELECT command to change the storage system's write-back cache setting.
- **disabled**: Host control of caching is disabled.
- **enabled**: Host control of caching is enabled.

**Sync Cache Mode**

Shows how the SCSI SYNCHRONIZE CACHE command is handled.
- **immediate**: Good status is returned immediately and cache content is unchanged. This option is the default.
- **flush to disk**: Good status is returned only after all write-back data for the specified volume is flushed to disk.

**Independent Cache Performance Mode**

Shows the cache redundancy mode for a dual-controller storage system.
Controller failover is enabled and data in a controller’s write-back cache is mirrored to the partner controller.

Enabled:
The controllers use Independent Cache Performance Mode, in which controller failover is disabled and data in a controller’s write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.

Missing LUN Response
Shows whether host drivers may probe for LUNs until the host drivers reach the LUN to which they have access.

Not ready: Sends a reply that there is a LUN where a gap has been created but that it’s “not ready.” Sense data returned is sensekey = 2, code = 4, qualifier = 3.

Illegal: Sends a reply that there is a LUN but that the request is “illegal.” Sense data returned is sensekey = 5, code = 25h, qualifier = 0.

CompactFlash Failure 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.

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

Disabled: The CompactFlash failure trigger is disabled.

Enabled: The CompactFlash failure trigger is enabled.

Power Supply Failure
Shows whether the cache policy automatically changes to write-through when a power supply fails.

Disabled: The power-supply failure trigger is disabled.

Enabled: The power-supply failure trigger is enabled.

Fan Failure
Shows whether the cache policy will change from write-back to write-through when a fan fails.

Disabled: The fan failure trigger is disabled.

Enabled: The fan failure trigger is enabled.

Temperature Exceeded
Shows whether the system will shut down a controller when its temperature exceeds the critical operating range.

Disabled: The over-temperature trigger is disabled.

Enabled: The over-temperature trigger is enabled.

Partner Notify
Shows whether the partner controller will be notified when that a trigger condition occurs.

Disabled: Notification is disabled.

Enabled: Notification is enabled.

Auto Write Back
Shows whether the cache mode will change from write-through to write-back when the trigger condition is cleared.

Disabled: Auto-write-back is disabled.
• enabled: Auto-write-back is enabled.

Inactive Drive Spin Down
Shows whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the Inactive Drive Spin Down Delay field.
  • Disabled: Drive spin down for available disks and global spares is disabled.
  • Enabled: Drive spin down for available disks and global spares is enabled.

Inactive Drive Spin Down Delay
Shows the period of inactivity in minutes after which spinning disks that are available or are global spares will spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.

Disk background scrub
Shows whether disks that are not in disk groups are automatically checked for disk defects to ensure system health. The interval between background disk scrub finishing and starting again is 72 hours.
  • disabled: Background disk scrub is disabled.
  • enabled: Background disk scrub is enabled.

Managed Logs
Shows whether the managed logs feature is enabled, which allows log files to be transferred from the storage system to a log collection system to avoid losing diagnostic data as logs fill.
  • Disabled: The managed logs feature is disabled.
  • Enabled: The managed logs feature is enabled.

Single Controller Mode
For a system that lacks a second controller module for redundancy and is intended to be used as a single-controller system, this parameter shows whether 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.
  • 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 MESM.

large pools
Shows whether the large-pools feature is enabled. This feature provides the capability to create a virtual pool larger than 512 TiB on each controller by limiting the number of user-defined snapshots that can be created in snapshot trees.
  • disabled: The maximum size for a virtual pool will be 1024 TiB (1 PiB). The maximum number of volumes per snapshot tree will be 9 (base volume plus 8 snapshots).
  • enabled: The maximum size for a virtual pool will be 512 TiB. The maximum number of volumes per snapshot tree will be 255 (base volume plus 254 snapshots).

Examples
Show advanced system-configuration settings.
# show advanced-settings

## Basetypes

- advanced-settings-table
- status

## See also

- set advanced-settings

## show cache-parameters

### Description
Shows cache settings and status for the system and optionally for a volume.

#### Minimum role
monitor

#### Syntax
```
show cache-parameters
```

#### Parameters
```
volume
```

Optional. Name or serial number of the volume for which to show settings. A name that includes a space must be enclosed in double quotes. If this parameter is not specified, only system-wide settings are shown.

#### Output

**System cache parameters:**

**Operation Mode**
Shows the system's operating mode, also called the cache redundancy mode:

- **Independent Cache Performance Mode:** For a dual-controller system, controller failover is disabled and data in a controller's write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.
- **Active-Active ULP:** Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance.
- **Single Controller:** The enclosure contains a single controller.
- **Failed Over:** Operation has failed over to one controller because its partner is not operational. The system has lost redundancy.
- **Down:** Both controllers are not operational.

**Controller cache parameters:**

**Write Back Status**
Shows the current, system-wide cache policy as determined by auto-write-through logic. This value is not settable by users. If an auto-write-through trigger condition (such as a CompactFlash failure) is met, the cache policy for all volumes changes to write-through, overriding the volume-specific settings. When the problem is corrected, the cache policy reverts to the value configured for each individual volume.

- **Enabled:** Write-back. This is the normal state.
- **Disabled:** Write-through.
- **Not up:** The controller is not up.

**CompactFlash Status**
- **Not Installed:** The CompactFlash card is not installed.
- **Installed:** The CompactFlash card is installed.

**CompactFlash Health**
- **OK**
- **Degraded**
- **Fault**
- **N/A**
- **Unknown**

**Cache Flush**
• Enabled: If the controller loses power, it will automatically write cache data to the CompactFlash card. Cache flush is normally enabled, but is temporarily disabled during controller shut down.
• Disabled: Cache flush is disabled.

**Volume cache parameters:**

**Serial Number**
If a volume is specified, its serial number.

**Name**
If a volume is specified, its name.

**Cache Write Policy**
If a volume is specified, its cache write policy:
• write-back: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput.
• write-through: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance.

**Cache Optimization**
If a volume is specified, its cache optimization mode:
• standard: This controller cache mode of operation is optimized for sequential and random I/O and is the optimization of choice for most workloads. In this mode, the cache is kept coherent with the partner controller. This mode gives you high performance and high redundancy.
• no-mirror: In this mode of operation, the controller cache performs the same as the standard mode with the exception that the cache metadata is not mirrored to the partner. While this improves the response time of write I/O, it comes at the cost of redundancy. If this option is used, the user can expect higher write performance but is exposed to data loss if a controller fails.

**Read Ahead Size**
If a volume is specified, its read-ahead cache setting:
• Disabled: Read-ahead is disabled.
• Adaptive: Adaptive read-ahead is enabled, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload.
• Stripe: Read-ahead is set to one stripe. The controllers treat NRAID and RAID-1 disk groups internally as if they have a stripe size of 512 KB, even though they are not striped.
• 512 KB, 1 MB, 2 MB, 4 MB, 8 MB, 16 MB, or 32 MB: Size selected by a user.

**Examples**
Show the cache parameters for the system and for volume V1.

```
# show cache-parameters V1
```

**Basetypes**
- cache-settings
- cache-parameter
- status

**See also**
- set volume-cache-parameters
- show volumes

## show certificate

**Description**
Shows the status of the system’s security certificate.

**Minimum role**
manage

**Syntax**
```
show certificate [a|b|both]
```
Parameters

[a|b|both]
Optional. Specifies whether to show information for controller A, B, or both. If this parameter is omitted, information is shown for both controllers.

Output

Properties are described in alphabetical order.

Certificate Status

- Customer-supplied: The controller is using a certificate that you have uploaded.
- System-generated: The controller is using system-generated certificates.
- Unknown status: The controller's certificate cannot be read. This most often occurs when a controller is restarting or the certificate replacement process is still in process

Certificate Text

The full text of the certificate.

Controller

- A: Controller A.
- B: Controller B.

Time Created

The date and time in the format year-month-day hour:minutes:seconds when the certificate was created.

Examples

Show certificate status for the system.

# show certificate

Basetypes

certificate-status
status

See also

create certificate

show chap-records

Description

Shows CHAP records for iSCSI originators.

This command is permitted whether or not CHAP is enabled

Minimum role

monitor

Syntax

show chap-records
[name originator-name]
[show-secrets]

Parameters

[name originator-name]
Optional. The originator name, typically in IQN format. If this parameter is omitted, all CHAP records are shown.

[show-secrets]
Optional. Minimum role: manage. Shows Initiator Secret and Mutual CHAP Secret values in command output. If this parameter is omitted, secret values are not shown.

Output

Initiator Name
The originator name.

Initiator Secret
The secret that the recipient uses to authenticate the originator.

Mutual CHAP Name
For mutual CHAP, the recipient name.
Mutual CHAP Secret

For mutual CHAP, the secret that the originator uses to authenticate the recipient.

**Examples**

As a user with the monitor role, show the CHAP record for a specific host initiator.

```
# show chap-records name iqn.1991-05.com.microsoft:myhost.domain
```

As a user with the manage role, show the CHAP record for a specific host initiator.

```
# show chap-records name iqn.1991-05.com.microsoft:myhost.domain show-secrets
```

**Basetypes**

- `chap-records`
- `status`

**See also**

- `create chap-record`
- `delete chap-records`
- `set chap-record`
- `show iscsi-parameters`

---

**show cli-parameters**

**Description**

Shows the current CLI session preferences.

**Minimum role**

monitor

**Syntax**

```
show cli-parameters
```

**Output**

Timeout

The time in seconds that the session can be idle before it automatically ends. Valid values are 120-43200 seconds (2-720 minutes).

**Output Format**

- **console**: Supports interactive use of the CLI by displaying command output in easily readable format. This format automatically sizes fields according to content and adjusts content to window resizes.
- **api**: Supports scripting by displaying command output in XML. All objects are displayed at the same level, related by COMP elements.
- **api-embed**: Alternate form of XML output which displays “child” objects embedded (indented) under “parent” objects.
- **ipa**: Alternate form of XML output which displays as api-embed format with brief mode enabled.
- **json**: Standard JavaScript Object Notation (JSON) output.
- **wbi**: A JSON-like format used internally by the MESM.

**Brief Mode**

- **enabled**: In XML output, this setting shows a subset of attributes of object properties. The name and type attributes are always shown.
- **disabled**: In XML output, this setting shows all attributes of object properties. This is the default.

**Base**

- **2**: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude.
- **10**: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude.

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

**Pager**

- **enabled**: Halts output after each full screen to wait for keyboard input.
- **disabled**: Output is not halted. When displaying output in API format, which is intended for scripting, disable paging.

**Locale**
The display language.

Precision #

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

Units

The unit for display of storage-space sizes:

- auto: Sizes are shown in units determined by the system.
- MB: Sizes are shown in megabytes.
- GB: Sizes are shown in gigabytes.
- TB: Sizes are shown in terabytes.

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

temperature scale

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

Management Mode

The management mode used in the current CLI session.

- Linear: Uses linear-storage terminology in command output and system messages. For example, vdisk for disk groups and pools.
- Virtual: Uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, disk group for disk groups and pool for pools.

Examples

Show current CLI settings.

# show cli-parameters

See also

set cli-parameters
show protocols

**show cloudiq**

Description

Shows the CloudIQ setting.

Minimum role

monitor

Syntax

show cloudiq

Parameters

Shows whether the ability to remotely monitor the system by using the Dell EMC CloudIQ application is enabled or disabled.

- Enabled – Use of the CloudIQ application is enabled.
- Disabled – Use of the CloudIQ application is disabled.

Specifies the status and date/time of the last transmission of CloudIQ log data to the support server.

CloudIQ Last Logs Send Status

CloudIQ Last Logs Send Time

Examples

Show the CloudIQ setting.

# show cloudiq

See also

set cloudiq
**show configuration**

**Description**
Shows system configuration information.

**NOTE:** Output for this command is lengthy. To control whether the output halts after each full screen to wait for keyboard input, enable or disable the pager parameter of the `set cli-parameters` command.

**Minimum role**
monitor

**Syntax**
```
show configuration
```

**Output**
- System information from `show system`
- Controller information from `show controllers`
- Controller firmware and hardware version information from `show versions` with the `detail` parameter
- Host and expansion port information from `show ports`
- Disk information from `show disks`
- Disk-slot information from `show disks` with the `encl` parameter
- Vdisk information from `show vdisks`
- Disk-group information from `show disk-groups`
- Pool information from `show pools`
- Enclosure information from `show enclosures`
- Field-replaceable unit (FRU) information from `show frus`

**Examples**
Show information about the system configuration.
```
# show configuration
```

**Basetypes**
- `system`
- `controllers`
- `versions`
- `port`
- `drives`
- `enclosure-list`
- `virtual-disks`
- `disk-groups`
- `pools`
- `enclosures`
- `enclosure-fru`
- `status`

**show controller-date**

**Description**
Shows the system's current date and time.

**Minimum role**
monitor

**Syntax**
```
show controller-date
```

**Output**
- **Controller Date**
  - Date and time in the format `year-month-day hour:minutes:seconds`
- **Time-Zone Offset**
  - The system's time zone as an offset in hours and minutes from Coordinated Universal Time (UTC). This is shown only if NTP is enabled.
Examples
Show the system date and time.
# show controller-date

Basetypes
time-settings-table
status

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

show controllers

Description
Shows information about each controller module.

Minimum role
monitor

Syntax
show controllers

Output
Controller module ID: A or B.
Serial Number
• Serial number.
• Not Available: The controller module is down or not installed.
Hardware Version
Hardware version.
CPLD Version
Complex Programmable Logic Device firmware version.
MAC Address
Network port MAC address.
WWNN
Storage system World Wide Node Name (WWNN).
IP Address
Network port IP address.
IP Subnet Mask
Network port IP subnet mask.
IP Gateway
Network port gateway IP address.

Disks
Number of disks in the storage system.
Virtual Pools
Number of virtual pools in the storage system.
Vdisks (v2)
Disk Groups (v3)
Number of disk groups in the storage system.
System Cache Memory (MB)
Controller module cache memory size, in MB, including CPU memory available to I/O.
Host Ports
Number of host ports in the controller module.
Disk Channels
Number of expansion ports in the controller enclosure.

Disk Bus Type
Type of interface between the controller module and disks:
- SAS

Status
- Operational
- Down
- Not Installed

Failed Over to This Controller
Indicates whether the partner controller has failed over to this controller:
- No: The partner controller has not failed over to this controller.
- Yes: The partner controller has either failed or been shut down, and its responsibilities have been taken over by this controller. There will be a delay between the time that the value of Status becomes Down for one controller and the time that the value of Failed Over to This Controller becomes Yes for the other controller. This time period is the time that it takes for a controller to take over the responsibilities of its partner.

Fail Over Reason
If Failed Over to This Controller is Yes, a reason for the failover appears; otherwise, Not applicable appears.

Multi-core
Shows whether the controller module is using multiple processing cores.
- Enabled: Multiple cores are active.
- Disabled: A single core is active.

Health
- OK
- Degraded
- Fault
- N/A
- Unknown

Health Reason
If Health is not OK, this field shows the reason for the health state.

Health Recommendation
If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Position
Position of the controller in the enclosure:
- Left: The controller is in the left slot.
- Right: The controller is in the right slot.
- Top: The controller is in the top slot.
- Bottom: The controller is in the bottom slot.

Phy Isolation
Shows whether the automatic disabling of SAS expander PHYs having high error counts is enabled or disabled for this controller.
- Enabled: PHY fault isolation is enabled.
- Disabled: PHY fault isolation is disabled.

Controller Redundancy Mode
Shows the system’s operating mode, also called the cache redundancy mode:
- **Independent Cache Performance Mode**: For a dual-controller system, controller failover is disabled and data in a controller’s write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.

- **Active-Active ULP**: Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance.

- **Single Controller**: The enclosure contains a single controller.

- **Failed Over**: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy.

- **Down**: Both controllers are not operational.

**Controller Redundancy Status**

- **Redundant with independent cache**: Both controllers are operational but are not mirroring their cache metadata to each other.

- **Redundant**: Both controllers are operational.

- **Operational but not redundant**: In active-active mode, one controller is operational and the other is offline. In single-controller mode, the controller is operational.

- **Down**: This controller is not operational.

- **Unknown**: Status information is not available.

**Examples**

Show controller information.

```bash
# show controllers
```

**Basetypes**

- `controllers status`

**See also**

- `show configuration`  
- `show frus`

---

**show controller-statistics**

**Description**

Shows live performance statistics for controller modules. For controller performance statistics, the system samples live data every 15 seconds.

Statistics shown only in API output are described in **API basetype properties**.

**Minimum role**

`monitor`

**Syntax**

`show controller-statistics`  
`[a|b|both]`

**Parameters**

- `a|b|both`

Optional. Specifies whether to show information for controller A, B, or both. If this parameter is omitted, information is shown for both controllers.

**Output**

- **Durable ID**
  
The controller ID in the format `controller_ID`.

- **CPU Load**
  
The percentage of time the CPU is busy, from 0 to 100.

- **Power On Time (Secs)**
  
The number of seconds since the controller was restarted.

- **Bps**
  
The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

- **IOPS**
  
The input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
Reads
The number of read operations since these statistics were last reset or since the controller was restarted.

Writes
The number of write operations since these statistics were last reset or since the controller was restarted.

Data Read
The amount of data read since these statistics were last reset or since the controller was restarted.

Data Written
The amount of data written since these statistics were last reset or since the controller was restarted.

Num Forwarded Cmds
The current count of commands that are being forwarded or are queued to be forwarded to the partner controller for processing. This value will be zero if no commands are being forwarded or are queued to be forwarded.

Reset Time
The date and time, in the format year-month-day hour:minutes:seconds, when these statistics were last reset, either by a user or by a controller restart.

The total amount of hours the controller has been powered on in its lifetime.

Examples
Show statistics for controller A.

# show controller-statistics a

Basetypes
controller-statistics
status

See also
reset all-statistics
reset controller-statistics

show debug-log-parameters

Description
Shows which debug message types are enabled (On) or disabled (Off) for inclusion in the Storage Controller debug log.

NOTE: This command is for use by or with direction from technical support.

Minimum role
monitor

Syntax
show debug-log-parameters

Output
For a description of each message type parameter, see set debug-log parameters.

Examples
Show debug log parameters.

# show debug-log-parameters

Basetypes
debug-log-parametersstatus

See also
debug-log-parameters
set debug-log-parameters

show disk-groups

Description
Shows information about disk groups. The command will show information for all disk groups by default, or you can use parameters to filter the output.

Minimum role
monitor

Syntax
show disk-groups
detail
Parameters

Optional. This parameter shows additional detail about disk groups.

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.

Optional. A comma-separated list of the names or serial numbers of the disk groups for which to show information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all disk groups.

Output

Properties are described in alphabetical order.

% of Pool
Shown by the detail parameter. The percentage of pool capacity that the disk group occupies.

Action
If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Active Drive Spin Down Delay
Shown by the detail parameter. For spinning disks in a linear disk group, the period of inactivity after which the disks and dedicated spares will automatically spin down, from 1 to 360 minutes. The value 0 means spin down is disabled. For virtual storage, not applicable.

Active Drive Spin Down Enable
Shown by the detail parameter.

• Disabled: DSD is disabled for the disk group.
• Enabled - all spinning: DSD is enabled for the disk group.
• Partial spin-down: DSD is enabled for the disk group and its disks are partially spun down to conserve power.
• Full spin-down: DSD is enabled for the disk group and its disks are fully spun down to conserve power.

ADAPT Actual Spare Capacity
Shown by the detail parameter.

• For an ADAPT disk group, the actual spare capacity in GiB.
• For a non-ADAPT disk group, N/A.

Blocksize
Shown by the detail parameter. The size of a block, in bytes.

Chunk Size
Shown by the detail parameter.

• For RAID levels except NRAID and RAID 1 and RAID 50, the chunk size for the disk group.
• For NRAID and RAID 1, chunk-size has no meaning and is therefore shown as not applicable (N/A).
• For RAID 50, the disk-group chunk size calculated as: \(\text{configured-chunk-size} \times (\text{subgroup-members} - 1)\). For a disk group configured to use 64-KB chunk size and 4-disk subgroups, the value would be 192k (64KB x 3).

Class
Shown by the detail parameter.

• Linear: The disk group acts as a linear pool.
• Virtual: The disk group is in a virtual pool.

Current Job Completion
Shown by the detail parameter. See Job%, below
Current Job
- DRSC: A disk is being scrubbed.
- EXPD: The disk group is being expanded.
- INIT: The disk group is initializing.
- RBAL: The ADAPT disk group is being rebalanced.
- RCON: At least one disk in the disk group is being reconstructed.
- VDRAIN: The virtual disk group is being removed and its data is being drained to another disk group.
- VPREP: The virtual disk group is being prepared for use in a virtual pool.
- VRECV: The virtual disk group is being recovered to restore its membership in the virtual pool.
- VREM: The disk group and its data are being removed.
- VRFY: The disk group is being verified.
- VRSC: The disk group is being scrubbed.
- Blank if no job is running.

Current Owner
Shown by the detail parameter. See Own, below.

Disks
The number of disks in the disk group.

Free
The amount of free space in the disk group, formatted to use the current base, precision, and units.

Health
- OK
- Degraded
- Fault
- N/A
- Unknown

Health Reason
Shown by the detail parameter. See Reason, below.

Health Recommendation
Shown by the detail parameter. See Action, above.

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

Name
The name of the disk group.

Own
Either the preferred owner during normal operation or the partner controller when the preferred owner is offline.

Pool
The name of the pool that contains the disk group.

Preferred Owner
Shown by the detail parameter. Controller that owns the disk group and its volumes during normal operation.

RAID
The RAID level of the disk group.

Reason
If Health is not OK, this field shows the reason for the health state.

Sec Fmt
The sector format of disks in the disk group.

- **512n**: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes.
- **512e**: All disks use 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.
- **Mixed**: The disk group contains a mix of 512n and 512e disks. This is supported, but for consistent and predictable performance, do not mix disks of different sector size types (512n, 512e).

**Sector Format**

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

**Serial Number**

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

**Size**

The capacity of the disk group, formatted to use the current base, precision, and units.

**Spares**

Shown by the `detail` parameter. For a linear disk group, the number of spares assigned to the disk group. For a virtual disk group, 0.

**Status**

- **CRIT**: Critical. The disk group is online but isn’t fault tolerant because some of its disks are down.
- **DMGD**: Damaged. The disk group is online and fault tolerant, but some of its disks are damaged.
- **FTDN**: Fault tolerant with a down disk. The disk group is online and fault tolerant, but some of its disks are down.
- **FTOL**: Fault tolerant and online.
- **MSNG**: Missing. The disk group is online and fault tolerant, but some of its disks are missing.
- **OFFL**: Offline. Either the disk group is using offline initialization, or its disks are down and data may be lost.
- **QTCR**: Quarantined critical. The disk group is critical with at least one inaccessible disk. For example, two disks are inaccessible in a RAID-6 disk group or one disk is inaccessible for other fault-tolerant RAID levels. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined.
- **QTDN**: Quarantined with a down disk. The RAID-6 disk group has one inaccessible disk. The disk group is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined.
- **QTOF**: Quarantined offline. The disk group is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 disk group.
- **STOP**: The disk group is stopped.
- **UNKN**: Unknown.
- **UP**: Up. The disk group is online and does not have fault-tolerant attributes.

**Tier**

- **Performance**: The disk group is in the highest storage tier, which uses SSDs (high speed).
- **Standard**: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).
- **Archive**: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity).
- **Read Cache**: The disk is an SSD providing high-speed read cache for a storage pool.

**Examples**

Show information about all disk groups.

```
# show disk-groups pool A
```

Show information about disk group dg0002 in pool B.

```
# show disk-groups pool B dg0002
```

**Basetypes**

- `disk-groups status`

**See also**

- `show disks`
- `show pools`
**show disk-group-statistics**

**Description**
Shows live performance statistics for disk groups. The command will show information for all disk groups by default, or you can use parameters to filter the output. For disk-group performance statistics, the system samples live data every 30 seconds.

Properties shown only in API format are described in API basetype properties.

**Minimum role**
monitor

**Syntax**
```
show disk-group-statistics
[disk-group disk-group]
[type linear|virtual]
```

**Parameters**
- **disk-group disk-group**
  Optional. Specifies the disk group for which to show information. If this parameter is omitted, information will be shown for all disk groups. A value that includes a space must be enclosed in double quotes.
- **type linear|virtual**
  Optional. Specifies whether to show information for linear disk groups or for virtual disk groups. If this parameter is omitted, information will be shown for both types.

**Output**
- **Name**
  The name of the disk group.
- **Time Since Reset**
  The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.
- **Reads**
  Number of read operations since these statistics were last reset or since the controller was restarted.
- **Writes**
  Number of write operations since these statistics were last reset or since the controller was restarted.
- **Data Read**
  Amount of data read since these statistics were last reset or since the controller was restarted.
- **Data Written**
  Amount of data written since these statistics were last reset or since the controller was restarted.
- **Bps**
  The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
- **IOPS**
  Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
- **I/O Resp Time**
  Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.
- **Read Resp Time**
  Average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.
- **Write Resp Time**
  Average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.
- **Pages Allocated per Min**
Shown for a virtual disk group. The rate, in pages per minute, at which pages are allocated to volumes in the disk group because they need more space to store data.

**Pages Deallocated per Min**

Shown for a virtual disk group. The rate, in pages per minute, at which pages are deallocated from volumes in the disk group because they no longer need the space to store data.

**Pages Reclaimed**

Shown for a virtual disk group. The number of 4-MB pages that have been automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).

**Pages Unmapped per Minute**

Shown for a virtual disk group. The number of 4-MB pages that host systems have unmapped per minute, through use of the SCSI UNMAP command, to free storage space as a result of deleting files or formatting volumes on the host.

**Examples**

Show live performance statistics for all disk groups.

```bash
# show disk-group-statistics
```

Show live performance statistics for disk group *dg0001*.

```bash
# show disk-group-statistics disk-group dg0001
```

**Basetypes**

`disk-group-statisticsstatus`

**See also**

`reset all-statistics`
`reset disk-group-statistics`
`show disk-groups`
`reset disk-statistics`

---

**show disk-parameters**

**Description**

Shows disk settings.

**Minimum role**

`monitor`

**Syntax**

`show disk-parameters`

**Output**

**SMART**

Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks.

- **Detect-Only**: Each disk in the system retains its individual SMART setting, as will new disks added to the system.
- **Enabled**: SMART is enabled for all disks in the system and will be enabled for new disks added to the system.
- **Disabled**: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.

**Drive Write Back Cache**

- **Disabled**: Disk write-back cache is disabled for all disks in the system and will be disabled for new disks added to the system. This value cannot be changed.

**Timeout Retry Maximum**

Maximum number of times a timed-out I/O operation can be retried before the operation is failed. This value cannot be changed.

**Attempt Timeout**

Number of seconds before an I/O operation is aborted and possibly retried. This value cannot be changed.

**Overall Timeout**

Total time in seconds before an I/O operation is failed regardless of the Attempt Timeout and Timeout Retry Maximum settings. This value cannot be changed.
Inactive Drive Spin Down

Shows whether spinning disks that are available or are global spares will spin down after a period of inactivity shown by the Inactive Drive Spin Down Delay field.

- **Disabled**: Drive spin down for available disks and global spares is disabled.
- **Enabled**: Drive spin down for available disks and global spares is enabled.

Inactive Drive Spin Down Delay

Shows the period of inactivity in minutes after which spinning disks that are available or are global spares will spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.

Examples

Show disk settings.

```
# show disk-parameters
```

Basetypes

`drive-parametersstatus`

See also

`set disk-parameters`

show disks

Shows information about all disks or disk slots in the storage system. The command will show information about all installed disks by default, or you can use parameters to filter the output.

**NOTE:** In console format, to aid reading, disks are sorted to display in order by enclosure and disk number. In API formats, output is not sorted because it is expected to be manipulated by a host application.

Minimum role

`monitor`

Syntax

To show information about disks:

```
show disks
[disk-group disk-groups]
[vdisk vdisks]|
[disks] [detail]|[fde]| [perf]| [temp]
```

To show information about disks having specific Usage values:

```
show disks usage available|failed|leftover|pool|spares|unusable
```

To show information about all disk slots:

```
show disks encl
```

Parameters

Optional. This parameter shows additional detail about the disk.

```
detail
```

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.

```
disk-group disk-groups
```

Optional. Shows information about each disk slot, whether it contains a disk or not. You cannot use this parameter with any other parameter.

```
encl
```

Optional. For all or specified disks, this option shows Full Disk Encryption information. Information shown includes the FDE state and lock key ID.

```
fde
```

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.

```
perf
```

Optional. Temperature statistics for each disk.

```
temp
```

Alphabetical list of commands 177
Optional. Shows the temperature for all installed disks.

vdisk vdisks

Optional. A comma-separated list of the IDs or serial numbers of linear disk groups for which to show disk information. A name that includes a space must be enclosed in double quotes.

Output

usage available|failed|leftover|pool|spares|unusable

Shows information about disks having specific Usage values:

- available: Disks whose usage is AVAIL.
- failed: Disks whose usage is FAILED.
- leftover: Disks whose usage is LEFTOVR.
- pool: Disks whose usage is VIRTUAL POOL. Disks whose usage is LINEAR POOL or VDISK. Disks whose usage is LINEAR POOL, VIRTUAL POOL, or VDISK.
- spares: Disks whose usage is GLOBAL SP. Disks whose usage is DEDICATED SP, GLOBAL SP, or VDISK SP. Disks whose usage is DEDICATED SP, GLOBAL SP, or VDISK SP.
- unusable: Disks whose usage is UNUSABLE.

For explanation of usage values, see the Usage property description below. You cannot use this parameter with any other parameter.

disks

Optional. Either:

A comma-separated list of the IDs of disks about which to show information. For disk syntax, see Command syntax

- all: Shows information about all installed disks.
- free: Shows information about all disks that are available.

Properties are described in alphabetical order.

Current Job

Shown by the detail parameter. See Jobs, below.

Data Transferred

Shown by the perf parameter. The total number of bytes transferred.

Description

Shown by default or by the detail, fde, or perf parameter.

- SAS: Enterprise SAS spinning disk.
- SAS MDL: Midline SAS spinning disk.
- SSD SAS: SAS solid-state disk.

Disk Group (v3)

Shown by default or by the detail parameter. The name of the disk group that contains the disk.

Drawer ID

Shown by the detail parameter. The ID of the drawer containing the disk.

Drive Spin Down Count

Shown by the detail parameter. The number of times the DSD feature has spun down this disk.

Encl

Shown by the encl parameter. The number of the enclosure where the disk is located.

FDE State

Shown by the detail or fde parameter. The FDE state of the disk:

- Unknown: The FDE state is unknown.
- Not FDE Capable: The disk is not FDE-capable.
- Not Secured: The disk is not secured.
- Secured, Unlocked: The system is secured and the disk is unlocked.
- Secured, Locked: The system is secured and the disk is locked to data access, preventing its use.
- FDE Protocol Failure: A temporary state that can occur while the system is securing the disk.

Health
Shown by default or by the detail.fde, or perf parameter.
- OK
- Degraded
- Fault
- N/A
- Unknown

Health Reason
Shown by the detail parameter. If Health is not OK, this field shows the reason for the health state.

Health Recommendation
Shown by the detail parameter. If Health is not OK, this field shows recommended actions to take to resolve the health issue.

I/O Resp Time
Shown by the perf parameter. The average time in microseconds to complete I/O.

Jobs
Shown by default.
- DRSC: The disk is being scrubbed.
- EXPD: The disk group is being expanded.
- INIT: The disk group is being initialized.
- RBAL: The ADAPT disk group is being rebalanced.
- RCON: The disk is being used in a reconstruct operation.
- VDRAIN: The virtual disk group is being removed and its data is being drained to another disk group.
- VPREP: The virtual disk group is being prepared for use in a virtual pool.
- VREC: The virtual disk group is being recovered to restore its membership in the virtual pool.
- VREM: The disk group and its data are being removed.
- VRSC: The disk group is being scrubbed.
-镰: Blank if no job is running.

LED Status
Shown by the detail parameter. The disk LED status:
- Rebuild: The disk's disk group is being reconstructed.
- Fault: The disk has a fault.
- ID: The disk's identification LED is illuminated.
- Remove: The disk is ready to be removed from the enclosure.
- Blank: If the disk is not part of a disk group or is spun down.

Location
Shown by default and by any parameter except encl. The disk location in the format enclosure-ID.slot-number.

Lock Key ID
Shown by the fde parameter. The current lock key ID.

Model
Shown by the encl parameter. The model number of the disk.

Pool
Shown by default. The name of the pool that contains the disk.
Pool Name
Shown by the detail parameter. See Pool, above.

Power On Hours
Shown by the detail parameter. The total number of hours that the disk has been powered on since it was manufactured. This value is stored in disk metadata and is updated in 30-minute increments.

Recon State
Shown by the detail parameter. The state of the disk (source or destination) if it is involved in a reconstruct operation.
- From: This disk is being used as the source of a reconstruct operation.
- To: This disk is being used as the target of a reconstruct operation.
- N/A: This disk is not being used in a reconstruct operation.

Rev
Shown by default or by the detail.fde or perf parameter. The firmware revision number.

Revision
Shown by the detail parameter. See Rev, above.

Sec Fmt
Shown by default or by the detail or perf parameter. The disk sector format.
- 512n: The disk uses 512-byte native sector size. Each logical block and physical block is 512 bytes.
- 512e: The disk uses 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.

Serial Number
Shown by default and by any parameter except temp. The serial number of the disk.

Single Pathed
Shown by the detail parameter:
- A or B: A dual-ported disk is communicating through a single port to the connected controller. A failure is preventing communication through the second port to the other controller.
- (blank): The disk is operating normally.

Size
Shown by default and by any parameter except fde or temp. The disk capacity, formatted to use the current base, precision, and units.

Slot
Shown by the encl parameter. The slot number in the enclosure where the disk is located.

SMART
Shown by the detail parameter. Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks.
- Detect-Only: Each disk in the system retains its individual SMART setting, as will new disks added to the system.
- Enabled: SMART is enabled for all disks in the system and will be enabled for new disks added to the system.
- Disabled: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.

Speed (kr/min)
Shown by default, detail, fde, or perf parameter. The speed of a spinning disk, in thousands of revolutions per minute, as specified by the disk vendor. For an SSD, 0 is shown.

SSD Life Remaining%
Shown by the detail parameter.
• 100%–0%: For an SSD, this field shows the percentage of disk life remaining. This value is polled every 5 minutes. When the value decreases to 20%, event 502 is logged with Informational severity. Event 502 is logged again with Warning severity when the value decreases to 5%, 2% or 1%, and 0%. If a disk crosses more than one percentage threshold during a polling period, only the lowest percentage will be reported.
• N/A: The disk is not an SSD.

Status
Shown by the encl parameter.
• Up: The disk is present and is properly communicating with the expander.
• Spun Down: The disk is present and has been spun down by the drive spin down feature.
• Warning: The disk is present but the system is having communication problems with the disk LED processor. For disk and midplane types where this processor also controls power to the disk, power-on failure will result in Error status.
• Error: The disk is present but is not detected by the expander.
• Unknown: Initial status when the disk is first detected or powered on.
• Not Present: The disk slot indicates that no disk is present.
• Unrecoverable: The disk is present but has unrecoverable errors.
• Unavailable: The disk is present but cannot communicate with the expander.
• Unsupported: The disk is present but is an unsupported type.

Temperature
Shown by the detail or temp parameter. The temperature of the disk.

Temperature Status
Shown by the temp parameter.
• OK: The disk sensor is present and detects no error condition.
• Warning: The disk sensor detected a non-critical error condition. The temperature is between the warning and critical thresholds.
• Critical: The disk sensor detected a critical error condition. The temperature currently exceeds the critical threshold.
• Unknown: The disk sensor is present but status is not available.

Tier
Shown by default or by the detail parameter.
• Performance: The disk is in the highest storage tier, which uses SSDs (high speed).
  • Standard: The disk is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).
  • Archive: The disk is in the lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity).
  • Read Cache: The disk is an SSD providing high-speed read cache for a storage pool.

Total I/Os
Shown by the perf parameter. The total number of I/O operations (reads and writes).

Transfer Rate
Shown by the detail parameter. The data transfer rate in Gbit/s. A footnote indicates that it is normal behavior for the rate to vary. 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.
• UNSUSABLE: 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.
• UNSUSABLE: The disk cannot be used in a disk group because the disk is from an unsupported vendor.
• VDISK: The disk is a member of a linear disk group.
• VDISK SP: The disk is a spare assigned to a linear disk group.
• VIRTUAL POOL: The disk is a member of a disk group in a virtual pool.

Vdisk (v2)

Shown by default or by the detail parameter. The name of the disk group that contains the disk.

Vendor

Shown by default and by any parameter except temp. The vendor of the disk.

Examples

Show disk information.
# show disks

Show disk-slot information.
# show disks encl

Show disk performance statistics.
# show disks perf

Show Full Disk Encryption information.
# show disks fde

Show disk temperature information.
# show disks temp

Show detailed information for disk 1.1:
# show disks 1.1 detail

Show information about available disks only:
# show disks usage available

Basetypes

drives
enclosure-list
status

See also

show disk-groups
show vdisks

**show disk-statistics**

**Description**

Shows live or historical performance statistics for disks. For disk performance statistics, the system samples live data every 15 seconds and historical data every quarter hour, and retains historical data for 6 months.

The historical option allows you to specify a time range or a number (count) of data samples to include. It is not recommended to specify both the time-range and count parameters. If both parameters are specified, and more samples exist for the specified time range, the samples' values will be aggregated to show the required number of samples.
Statistics shown only in API output are described in API basetype properties.

**Minimum role**

monitor

**Syntax**

To show live statistics:

```
show disk-statistics
[error-stats]
[disks]
```

To show historical statistics:

```
show disk-statistics [all]
[count number-of-data-samples]
[filename filename.csv]
historical
[time-range "date/time-range"]
```

**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. Specifies a comma-separated list of disks for which to show information. If this parameter is omitted, information will be shown for all disks. For disk syntax, see Command syntax

**Output**

**Live**

**Location**

The disk location in the format disk_enclosure-ID.slot-number.

**Serial Number**

The serial number of the disk.

**Pwr Hrs**

Alphabetical list of commands 183
The total number of hours that the disk has been powered on since it was manufactured. This value is stored in disk metadata and is updated in 30-minute increments.

Bps
The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

IOPS
The number of input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

Reads
The number of read operations since these statistics were last reset or since the controller was restarted.

Writes
The number of write operations since these statistics were last reset or since the controller was restarted.

Data Read
The amount of data read since these statistics were last reset or since the controller was restarted.

Data Written
The amount of data written since these statistics were last reset or since the controller was restarted.

Lifetime Read
The amount of data read from the disk in its lifetime.

Lifetime Written
The amount of data written to the disk in its lifetime.

Reset Time
Date and time, in the format year-month-day hour:minutes:seconds, when these statistics were last reset, either by a user or by a controller restart.

Live, error-stats
Location
The disk location in the format disk_enclosure-ID.slot-number.

Serial Number
The serial number of the disk.

SMART port#
The number of SMART events recorded.

Time port#
The number of timeouts accessing the disk.

NResp port#
The number of times the disk did not respond.

Spin port#
The number of attempts by the storage system to spin up the disk.

Med port#
The number of media errors generated by the disk, as specified by its manufacturer.

NMed port#
The number of other errors generated by the storage system, or generated by the disk and not categorized as media errors.

BAsgn port#
The number of times blocks were reassigned to alternate locations.

BB1k port#
The number of bad blocks encountered.

**Historical**

- **Durable ID**
  The disk ID in the format `disk_enclosure-number.disk-number`.
- **Serial Number**
  The serial number of the disk.
- **Total I/Os**
  The total number of read and write operations since the last sampling time.
- **Reads**
  Shown by the all parameter. The number of read operations since the last sampling time.
- **Writes**
  Shown by the all parameter. The number of write operations since the last sampling time.
- **Data Transferred**
  The total amount of data read and written since the last sampling time.
- **Data Read**
  Shown by the all parameter. The amount of data read since the last sampling time.
- **Data Written**
  Shown by the all parameter. The amount of data written since the last sampling time.
- **Total IOPS**
  The total number of read and write operations per second since the last sampling time.
- **Read IOPS**
  Shown by the all parameter. The number of read operations per second since the last sampling time.
- **Write IOPS**
  Shown by the all parameter. The number of write operations per second since the last sampling time.
- **Total B/s**
  The total data transfer rate, in bytes per second, since the last sampling time.
- **Read B/s**
  Shown by the all parameter. The data transfer rate, in bytes per second, for read operations since the last sampling time.
- **Write B/s**
  Shown by the all parameter. The data transfer rate, in bytes per second, for write operations since the last sampling time.
- **Queue Depth**
  Shown by the all parameter. The average number of pending read and write operations being serviced since the last sampling time. This value represents periods of activity only and excludes periods of inactivity.
- **I/O Resp Time**
  The average response time, in microseconds, for read and write operations since the last sampling time.
- **Read Resp Time**
  Shown by the all parameter. The average response time, in microseconds, for read operations since the last sampling time.
- **Write Resp Time**
  Shown by the all parameter. The average response time, in microseconds, for write operations since the last sampling time.
- **Average I/O Size**
Shown by the all parameter. The average data size of read and write operations since the last sampling time.

Average Read I/O Size

Shown by the all parameter. The average data size of read operations since the last sampling time.

Average Write I/O Size

Shown by the all parameter. The average data size of write operations since the last sampling time.

Number of Disk Errors

Shown by the all parameter. The total number of disk errors detected since the last sampling time. Error types include: number of SMART events; number of timeouts accessing the disk; number of times the disk did not respond; number of attempts by the storage system to spin-up the disk; media errors generated by the disk as specified by its manufacturer; non-media errors (generated by the storage system, or by the disk and not categorized as media errors); number of bad-block reassignments.

Sample Time

Date and time, in the format year-month-day hour:minutes:seconds, when the data sample was taken

Examples

Show live statistics for disks 1.1 and 2.1.

# show disk-statistics 1.1,2.1

Show live error statistics for all disks.

# show disk-statistics error-stats

Show historical statistics from a specified date and time range for disk 1.5.

# show disk-statistics 1.5 historical time-range "start 2011-12-05 4:40 PM end 2011-12-05 5:00 PM"

Show all samples of historical statistics for disk 1.5.

# show disk-statistics 1.5 historical all

Basetypes

disk-statistics (live)

drive-summary (historical) status

See also

reset all-statistics
reset disk-error-statistics reset disk-statistics
show disk-group-statistics show disks

show dns-management-hostname

Description

Shows the management host name for each controller module.

If DNS server functionality is operational and reachable by the controller’s nslookup service, 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 controller’s management host name.

Domain Name (DNS)

The controller’s FQDN or '-'.

Examples

Show the management host name for each controller module.

# show dns-management-hostname
Basetypes

mgmt-hostnames
status

See also

clear dns-parameters
set dns-management-hostname
reset dns-management-hostname
set dns-parameters

show dns-parameters

Description
Shows configured DNS settings for each controller module.

Minimum role
monitor

Syntax
show dns-parameters

Output
Controller
The controller ID: A or B.

Name Servers
Configured name server IP address values.

Search Domains
Configured domain name values

Examples
Show the system’s DNS settings.
# show dns-parameters

Basetypes
controller-dns-parameters
dns-parameters
status

See also
clear dns-parameters
set dns-parameters
set email-parameters
show email-parameters

show email-parameters

Description
Shows email (SMTP) notification parameters for events and managed logs.

Minimum role
monitor

Syntax
show email-parameters

Output
Email Notification
• Disabled: Email notification is disabled.
• Enabled: Email notification is enabled.

Email Notification Filter
Shows the minimum severity for which the system should send notifications:
• crit: Sends notifications for Critical events only.
• error: Sends notifications for Error and Critical events.
• warn: Sends notifications for Warning, Error, and Critical events.
- **resolved**: Sends notifications for Resolved, Warning, Error, and Critical events.
- **info**: Sends notifications for all events.
- **none**: Disables email notification. This is the default. If this option is specified, no other parameters are required and their current values are not changed.

This parameter does not apply to managed-logs.

### Email Address (1–3)
Shows up to three email addresses for recipients of event notifications.

### Log Destination
Shows the email address for the log collection system used by the managed logs feature.

### Security Protocol
- **tls**: Enables Transport Layer Security (TLS) authentication. The standard ports for TLS are 25 or 587.
- **ssl**: Enables Secure Sockets Layer (SSL) authentication. The standard port for SSL is 465.
- **none**: Do not use a security protocol. The standard port is 25. This setting is the system default.

### Server Port
The port on which the configured SMTP server is listening. This is either automatically configured to a default setting by the system, or has been overridden by the user.

### Email Server
The IP address or domain name of the SMTP mail server to use for the email messages.

### Email Domain
The domain name that, with the sender name, forms the “from” address for remote notification.

### Email Sender
The sender name that, with the domain name, forms the “from” address for remote notification.

### Email Sender Password
The sender password. For a configured sender, the password is represented by eight asterisks.

### Include Logs
Shows whether system log files will automatically be attached to email notification messages generated by the managed logs feature. This is the “push” mode for managed logs.

### Examples
Show settings for email notification.

```
# show email-parameters
```

### Basetypes
- `email-parameters`
- `status`

### See also
- `set dns-parameters`
- `set email-parameters`
- `show dns-parameters`

---

**show enclosures**

### Description
Shows information about the enclosures in the storage system. Full detail available in API output only. If a connected expansion enclosure is not supported, it will not be listed and events 315 and 443 will be logged.

### Minimum role
`monitor`

### Syntax
```
show enclosures
```

### Parameters
- `Encl`
  The enclosure ID.
Encl WWN
The enclosure WWN.

Name
The enclosure name.

Location
The enclosure location, or blank if not set.

Rack
The number of the rack that contains the enclosure.

Pos
The position of the enclosure in the rack

Vendor
The enclosure vendor.

Model
The enclosure model.

EMP controller-ID BUS:ID Rev
The channel ID and firmware revision of the Enclosure Management Processor in each controller’s Expander Controller.

Midplane Type
An abbreviation that describes the enclosure midplane's rack-unit height, maximum number of disks, maximum data rate to disks (Gbit/s), and hardware version.

Health
• Show information about all enclosures in the system.
  # show enclosures
  OK
• Degraded
• Fault
• N/A
• Unknown

Reason
If Health is not OK, this field shows the reason for the health state.

Action
If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Drawer Information

Drawer
The number of the drawer.

Name
The name of the drawer.

Status
Status of the drawer
• Up
• Warning
• Error
• Unknown
• Unavailable
• Not Present
Health

- OK
- Degraded
- Fault
- N/A
- Unknown

Reason

If Health is not OK, this field shows the reason for the health state.

Action

If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Examples

Show information about all enclosures in the system.

# show enclosures

Basetypes

enclosures
status

See also

set enclosure
show sensor-status

show events

Description

Shows events logged by each controller in the storage system. A separate set of event numbers is maintained for each controller. Each event number is prefixed with a letter identifying the controller that logged the event.

Events are listed from newest to oldest, based on a timestamp with one-second granularity. Therefore the event log sequence matches the actual event sequence within about one second.

Minimum role

monitor

Syntax

show events [a|b|both|error]
[detail]
[from timestamp]
[from-event event-ID]
[last #]
[logs yes|no]
[to timestamp]
[to-event event-ID]

Parameters

a|b|both|error

Optional. Specifies to filter the event listing:

- a: Shows events from controller A only. Do not use this parameter with the from-event parameter or the to-event parameter.
- b: Shows events from controller B only. Do not use this parameter with the from-event parameter or the to-event parameter.
- both: Shows events from both controllers. Do not use this parameter with the from-event parameter or the to-event parameter.
- error: Shows Warning, Error, and Critical events, but not Informational or Resolved events.

detail

Optional. Shows additional information and recommended actions for displayed events.
from timestamp
Optional. Shows events that occurred on or after a timestamp specified with the format MMDDYYhhmmss. For example, 043011235900 represents April 30 2011 at 11:59:00 p.m. This parameter can be used with the to parameter or the to-event parameter.

from-event event-ID
Optional. Shows events including and after the specified event ID. If this number is smaller than the ID of the oldest event, events are shown from the oldest available event. Events are shown only for the controller that the event ID specifies (A or B). This parameter can be used with the to parameter or the to-event parameter.

last #
Optional. Shows the latest specified number of events. If this parameter is omitted, all events are shown.

logs yes|no
Optional.
- yes: Lists events as described in the Output section, below. This is the default.
- no: Shows events in tabular format, with columns for event ID, date and time, event code, severity, and message.

to timestamp
Optional. Shows events that occurred on or before a timestamp specified with the format MMDDYYhhmmss. For example, 043011235900 represents April 30 2011 at 11:59:00 p.m. This parameter can be used with the from parameter or the from-event parameter.

to-event event-ID
Optional. Shows events before and including the specified event ID. If this number is larger than the ID of the oldest event, events are shown up to the latest event. Events are shown only for the controller that the event ID specifies (A or B). This parameter can be used with the from parameter or the from-event parameter.

- Date and time when the event was logged.
- Event code identifying the type of event to help diagnose problems. For example: [3]
- Event ID prefixed by A or B, indicating which controller logged the event. For example: #A123
- Model, serial number, and ID of the controller module that logged the event.
- Severity:
  - CRITICAL: A failure occurred that may cause a controller to shut down. Correct the problem immediately.
  - ERROR: A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible.
  - WARNING: A problem occurred that may affect system stability but not data integrity. Evaluate the problem and correct it if necessary.
  - INFORMATIONAL: A configuration or state change occurred, or a problem occurred that the system corrected. No action is required.
  - RESOLVED: A condition that caused an event to be logged has been resolved.
- Event-specific message giving details about the event.

Examples

Show the last two events.
# show events last 2

Show the last three non-Informational events.
# show events last 3 error

Show all events from April 30 2014 at 11:59:00 p.m. through May 2 2014 at 11:59:00 a.m.
# show events from 043014235900 to 050214115900

Show a range of events logged by controller A.
# show events from-event a100 to-event a123

Show detailed output for a specific event.
# show events from-event A2264 to-event A2264 detail

**Basetypes**
- events
- eventsLogs
- status

**See also**
- clear events
- set snmp-parameters
- show snmp-parameters

## show expander-status

**Description**
Shows diagnostic information relating to SAS Expander Controller physical channels, known as PHY lanes.

**NOTE:** This command is for use by or with direction from technical support.

For each enclosure, this command shows status information for PHYs in I/O module A and then I/O module B.

**Minimum role**
monitor

**Syntax**
```
show expander-status
```

**Output**
- **Encl**
The enclosure that contains the SAS Expander.
- **Drawer**
  Shown in drawer output. The number of the drawer.
- **Expander**
  Shown in drawer output. The number of the Expander.
- **Ctlr**
The I/O module that contains the SAS Expander.
- **Phy**
  Identifies a PHY’s logical location within a group based on the PHY type. If the PHY’s controller module or expansion module is not installed, this field shows "--".
  
  **phy phy-ID**
  The logical PHY number.

**Type:**
- **Drawer0-Egress**: Drawer 0 egress PHY
- **Drawer0-Ingress-0**: Drawer 0 ingress PHY 0
- **Drawer1-Egress**: Drawer 1 egress PHY
- **Drawer1-Ingress**: Drawer 1 ingress PHY
- **Drawer2-Egress**: Drawer 2 egress PHY
- **Drawer2-Ingress**: Drawer 2 ingress PHY
- **Drive**: Drive slot PHY
- **Egress**: Expansion port egress PHY
- **Expander-Egress-0**: Expansion port 0 egress PHY
- **Expander-Egress-1**: Expansion port 1 egress PHY
- **Expander-Ingress-0**: Expansion port 0 ingress PHY
- **Expander-Ingress-1**: Expansion port 1 ingress PHY
- **Ingress**: Expansion port ingress PHY
- **Inter-Exp**: Inter-Expander PHY
- **SC**: Storage Controller PHY
- **SC-0**: Storage Controller primary PHY
- **SC-1**: Storage Controller alternate PHY
• SC-a: Storage Controller alternate PHY
• SC-p: Storage Controller primary PHY
• SCA-A: Storage Controller A alternate PHY
• SCA-P: Storage Controller A primary PHY
• SCB-A: Storage Controller B alternate PHY
• SCB-P: Storage Controller B primary PHY

Status

• Enabled - Healthy: The PHY is enabled and healthy.
• Enabled - Degraded: The PHY is enabled but degraded.
• Disabled: The PHY has been disabled by a user or by the system

Elem Status

A standard SES status for the element:

• Disabled: Critical condition is detected.
• Error: Unrecoverable condition is detected. Appears only if there is a firmware problem related to PHY definition data.
• Non-critical: Non-critical condition is detected.
• Not Used: Element is not installed in enclosure.
• OK: Element is installed and no error conditions are known.
• Unknown: Either:
  • Sensor has failed or element status is not available. Appears only if an I/O module indicates it has fewer PHYs than the reporting I/O module, in which case all additional PHYs are reported as unknown.
  • Element is installed with no known errors, but the element has not been turned on or set into operation.

Disabled

• Enabled: PHY is enabled.
• Disabled: PHY is disabled.

Reason

• Blank if Elem Status is OK.
• Error count interrupts: PHY disabled because of error-count interrupts.
• Externally disabled Phy control: PHY disabled by a SES control page as a result of action by a Storage Controller or user.
• Not ready: PHY is enabled but not ready. Appears for SC-1 PHYs when the partner I/O module is not installed. Appears for Drive, SC-1, or Ingress PHYs when a connection problem exists such as a broken connector.
• Firmware reboot.
• Drive removed: PHY disabled because drive slot is empty.
• Unused - disabled by default: PHY is disabled by default because it is not used.
• Excessive Phy changes: PHY is disabled because of excessive PHY change counts.
• Did not initialize

Examples

Show expander status for each enclosure.

# show expander-status

Basetypes

sas-status-controller-a
sas-status-drawer
status

See also

clear expander-status
set expander-fault-isolation
set expander-phy
show fan-modules

Description
Shows information about each fan module in the storage system.
To see information about both fans in each fan module, use the show fans command.

Minimum role
monitor

Syntax
show fan-modules

Output
Encl
The ID of the enclosure that contains the fan module.
Id
The fan module position, shown as an index value that starts at 0 and increments from left to right as viewed from the back of the enclosure.
Name
The name of the fan module in the format Fan Module ID.
Health
- OK
- Degraded
- Fault
- N/A
- Unknown
Reason
If Health is not OK, this field shows the reason for the health state.
Action
If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Examples
Show about all fan modules in the system.
# show fan-modules

Basetypes
fan-modules
status

See also
show fans
show power-supplies

show fans

Description
Shows information about each fan in the storage system.
To see information about the fan modules that contain each pair of fans, use the show fan-modules command.

Minimum role
monitor

Syntax
show fans

Output
Name
The fan name.
Location
The fan location in the format Enclosure enclosure-ID - position. The position is as viewed from the back of the enclosure.
Status
• Up
• Error
• Off
• Missing

Speed
The fan speed (revolutions per minute).

Position
The fan position, as viewed from the back of the enclosure:
• Left
• Right
• N/A

Serial Number
• (blank): Not applicable.

Part Number
• (blank): Not applicable.

Firmware version
• (blank): Not applicable.
• The firmware revision of a fan FRU.

Hardware version
• (blank): Not applicable.

Health
• OK
• Degraded
• Fault
• N/A
• Unknown

Reason
If Health is not OK, this field shows the reason for the health state.

Action
If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Examples
Show about all fans in the system.

`# show fans`

Basetypes
fan
status

See also
`show power-supplies`

**show fde-state**

**Description**
Shows Full Disk Encryption information for the storage system.

**NOTE:**
If you insert an FDE disk into a secured system and the disk does not come up in the expected state, perform a manual rescans by using the `rescan` command.

**Minimum role**
monitor

**Syntax**
`show fde-state`
Output

FDE Security Status

- Unsecured. The system has not been secured with a passphrase.
- Secured. The system has been secured with a passphrase.
- Secured, Lock Ready. The system has been secured and lock keys have been cleared. The system will become locked after the next power cycle.
- Secured, Locked. The system is secured and the disks are locked to data access, preventing their use.

Lock Key ID

The current lock ID is displayed.

Import Key ID

The previous or import lock ID is displayed.

FDE Configuration Time

If the system is secured, the time at which the current lock ID was set.

Examples

Show FDE information.

```
# show fde-state
```

Basetypes

- `fde-state`
- `status`

See also

- `clear fde-keys`
- `set fde-import-key`
- `set fde-lock-key`
- `set fde-state`

**show fenced-data**

Description

Shows information about fenced data blocks in the storage system. The command will show information for all fenced blocks by default, or you can use parameters to filter the output.

Fenced data blocks are blocks of data on disk which, for either of the following reasons, cannot be recovered and have been lost:

- Typically, fenced data occurs when a disk in a non-fault-tolerant disk group detects an unrecoverable media error.
- Fenced data can also occur if multiple unrecoverable blocks are detected which exceed the capacity of the RAID error-recovery algorithms.

Unrecoverable data blocks are “fenced” by marking them unreadable by the storage system. A data block remains fenced until the host writes the block, at which time it is again accessible.

For NRAID and RAID 0, fenced data is not tracked. Errors are returned directly during host reads.

For RAID 1 and 10, fenced blocks correspond with the data blocks where unrecoverable errors are detected, normally when a disk group is not fault tolerant and the remaining good disk has a media error.

For RAID 3, 5, 6, 50 for linear storage or 5, 6, and ADAPT for virtual storage, a single unrecoverable error detected while not fault tolerant can result in two or more blocks being fenced. This is because each parity block protects multiple data blocks. Thus, for RAID 3, 5, and 50, if a block returns an unrecovered error during reconstruction, that block is lost (because it cannot be read). The block being reconstructed is also lost because there is not enough information to reconstruct the data for that block. RAID 6 and ADAPT will similarly mark multiple bad blocks if a combination of failed disks and media errors results in unrecoverable data.

When the controller module fences data, it logs events 542 and 543.

Minimum role

- `monitor`

Syntax

```
show fenced-data [all]
```
Parameters

all
Optional. Shows information about all fenced data blocks.

[vdisks]
Optional. The names or serial numbers of disk groups for which to show fenced data block information. A name that includes a space must be enclosed in double quotes.

[volumes]
Optional for linear storage. The names or serial numbers of linear volumes for which to show fenced data block information. A name that includes a space must be enclosed in double quotes.

Output

Volume Name
The volume name for which fenced data is reported.
Volume Serial Number
The volume serial number for which fenced data is reported.
Volume LBA
The LBA in the volume at which fenced data is reported.
Vdisk Name
The name of the disk group for which fenced data is reported.
Vdisk Serial Number
The serial number of the disk group for which fenced data is reported.
Vdisk LBA
The LBA in the disk group at which fenced data is reported.

Examples

Show information about fenced data blocks for all volumes.

# show fenced-data all

Basetypes

fenced-data
status

See also

show disk-groups
show events
show vdisks
show volumes

show frus

Description

Shows FRU (field-replaceable unit) information for the storage system. Some information is for use by service technicians.

Minimum role

monitor

Syntax

show frus

Output

Enclosure ID
The enclosure ID.

**FRU fields:**

Name

- CHASSIS_MIDPLANE: Chassis and midplane circuit board
- RAID_IOM: Controller module
- BOD_IOM: Expansion module
- POWER_SUPPLY: Power supply module
- DRAWER: Enclosure disk drawer
- FAN_MODULE: Fan module
- SIDEPLANE: Sideplane

Description

The FRU description.

Part Number

The FRU part number.

Serial Number

The FRU serial number.

Revision

The hardware revision level.

Dash Level

The FRU template revision number.

FRU Shortname

A short description of the FRU.

Manufacturing Date

The date and time in the format year-month-day hour:minutes:seconds when a PCBA was programmed or a power supply module was manufactured.

Manufacturing Location

The city, state/province, and country where the FRU was manufactured.

Manufacturing Vendor ID

The JEDEC ID (global manufacturing code) of the manufacturer.

FRU Location

The location of the FRU in the enclosure.

Configuration SN

The configuration serial number.

FRU Status

- Absent: The FRU is not present.
- Fault: The FRU’s health is Degraded or Fault.
- Invalid Data: The FRU ID data is invalid. The FRU’s EEPROM is improperly programmed.
- OK: The FRU is operating normally.
- Power OFF: The FRU is powered off.

Original SN

For a power supply module, the original manufacturer serial number. Otherwise, N/A.

Original PN

For a power supply module, the original manufacturer part number. Otherwise, N/A.

Original Rev

For a power supply module, the original manufacturer hardware revision. Otherwise, N/A.
Enclosure ID
The enclosure number

Examples
Show information about all FRUs in the system.

# show frus

Basetypes
closure-fru
status

show host-groups

Description
Shows information about host groups and hosts. The command will show information for all host groups (and hosts) by default, or you can use parameters to filter the output.

Minimum role
monitor

Syntax
show host-groups
[hosts hosts]
[groups host-groups]

Parameters
hosts hosts
Optional. A comma-separated list of the names of hosts for which to show host and initiator information. If this parameter is omitted, information is shown for all hosts. A value that includes a space must be enclosed in double quotes.

groups host-groups
Optional. A comma-separated list of the names of host groups for which to show host-group, host, and initiator information. If this parameter is omitted, information is shown for all host groups. A value that includes a space must be enclosed in double quotes.

Output

Host group information:
Name
The name of the host group.
Number of Members
The number of hosts in the host group.

Host information:
Name
The host name.
Number of Members
The number of initiators in the host.

Initiator information:
Nickname
The nickname of the initiator.
Discovered
- Yes: The initiator was discovered and its entry was automatically created.
- No: The initiator was manually created
Mapped
Shows whether the initiator is explicitly mapped to any volumes:
- Yes: At least one volume is explicitly mapped to the initiator.
- No: No volumes are explicitly mapped to the initiator.
Profile
Standard: Default profile.
ID
For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).

Examples
Show information about all host groups.
# show host-groups
Show information about host groups HGroup1 and HGroup3.
# show host-groups groups HGroup1,HGroup3

Basetypes
host-group
status

See also
create host-group
delete host-groups
set host-group

show host-phy-statistics

Description
Shows diagnostic information relating to SAS controller physical channels, known as PHY lanes, for each host port.
This command shows PHY status information for each host port found in an enclosure. Each controller in an enclosure may have multiple host ports. A host port may have multiple PHYs. For each PHY, this command shows statistical information in the form of numerical values.
There is no mechanism to reset the statistics. All counts start from the time the controller started up. The counts stop at the maximum value for each statistic.
This command is only applicable to systems that have controllers with SAS host ports.

Minimum role
monitor

Syntax
show host-phy-statistics

Output
Ports
The controller ID and port number of the SAS host ports for which PHY statistics are displayed.
Phy
Identifies a PHY’s logical location within a group based on the PHY type. Logical IDs are 0–3 for host port PHYs. Each SAS host will have multiple PHYs.
Disparity
The number of doublewords containing running disparity errors that have been received by the PHY, not including those received during Link Reset sequences. A running disparity error occurs when positive and negative values in a signal do not alternate.
Lost DWORD
The number of times the PHY has lost doubleword synchronization and restarted the Link Reset sequence.
Invld DWORD
The number of invalid doublewords that have been received by the PHY, not including those received during Link Reset sequences.
ResErrCnt
The number of times the PHY Reset sequence has failed

Examples
Show PHY statistics for controller host ports.
show host-phy-statistics

Basetypes

sas-host-phy-statistics

status

See also

show host-port-statistics

show host-port statistics

Description

Shows live performance statistics for each controller host port. For each host port these statistics quantify I/O operations through the port between a host and a volume. For example, each time a host writes to a volume’s cache, the host port’s statistics are adjusted. For host-port performance statistics, the system samples live data every 15 seconds.

Statistics shown only in API output are described in API basetypes properties.

Minimum role

monitor

Syntax

show host-port-statistics

[ports ports]

Parameters

ports ports

Optional. Specifies a comma-separated list of port IDs for which to show information. For port syntax, see Command syntax. If this parameter is omitted, information is shown for all host ports.

Output

Durable ID

The host port ID in the format hostport_controller-ID-and-port-number.

Bps

The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

IOPS

The input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

Reads

The number of read operations since these statistics were last reset or since the controller was restarted.

Writes

The number of write operations since these statistics were last reset or since the controller was restarted.

Data Read

The amount of data read since these statistics were last reset or since the controller was restarted.

Data Written

The amount of data written since these statistics were last reset or since the controller was restarted.

Queue Depth

The number of pending I/O operations being serviced.

I/O Resp Time

The average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.

Read Resp Time

The average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.

Write Resp Time
The average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.

Reset Time
The date and time, in the format year-month-day hour:minutes:seconds, when these statistics were last reset, either by a user or by a controller restart.

Examples
Show live performance statistics for all host ports.
# show host-port-statistics
Show live performance statistics for host port A1.
# show host-port-statistics ports a1

Basetypes
host-port-statistics
status

See also
reset all-statistics
show host-port-statistics
show host-phy-statistics
show ports

show initiators

Description
Shows information about initiators. The command will show information about all initiators by default, or you can use parameters to filter the output.

Initiator entries are automatically created for host initiators that have sent an inquiry command or a report luns command to the system. This typically happens when the physical host containing an initiator boots up or scans for devices. When the command is received, the system saves the host port information. However, the information is retained after a restart only if you have set a name for the initiator.

Minimum role
monitor

Syntax
show initiators
[hosts hosts]
[initiators]

Parameters
hosts hosts
Optional. A comma-separated list of the names of hosts containing initiators for which to show information. If this parameter is omitted, information is shown for all initiators.

initiators
Optional. A comma-separated list of the names of initiators for which to show information. If this parameter is omitted, information is shown for all initiators.

Output
Nickname
The name of the initiator.

Discovered
• Yes: The initiator was discovered and its entry was automatically created.
• No: The initiator was manually created.

Mapped
Shows whether the initiator is explicitly mapped to any volumes:
• Yes: At least one volume is explicitly mapped to the initiator.
• No: No volumes are explicitly mapped to the initiator.

Profile
**Standard**: Default profile.

**Host Type**
The host-interface type: FC; iSCSI; SAS.

**ID**
For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).

**Examples**
Show information about all initiators.
```
# show initiators
```
Show information about initiators in host Host1 only.
```
# show initiators hosts Host1
```

**Basetypes**
```
status
initiator
```

**See also**
```
delete initiator-nickname
set initiator
show host-groups (with the hosts parameter)
```

---

**show inquiry**

**Description**
Shows inquiry data for each controller module.

**Minimum role**
monitor

**Syntax**
```
show inquiry
```

**Output**
- Product vendor name, product ID, vendor ID, and SCSI product ID
- Management Controller firmware version and loader version
- Storage Controller firmware version and loader version
- Controller module serial number
- Media Access Control (MAC) address
- Network port

**Examples**
Show inquiry data for controller modules in the system.
```
# show inquiry
```

**Basetypes**
```
inquiry
status
```

**See also**
```
show versions
```

---

**show ipv6-addresses**

**Description**
Shows static IPv6 addresses assigned to each controller's network port.

**Minimum role**
monitor

**Syntax**
```
show ipv6-addresses
[controller a|b|both]
```

**Parameters**
```
controller a|b|both
```
Optional. Specifies whether to show addresses for controller A, controller B, or both. If this parameter is omitted, information is shown for both controllers.
Controller ID: A or B.

Index
The controller's index value for the address. The index is automatically assigned when adding a static IPv6 address.

Label
The name assigned to the address, or '-' if the address is unnamed.

Address
The IPv6 address with prefix length.

Examples
Show static IPv6 addresses assigned to controller A.

# show ipv6-addresses controller a

Base types
ipv6-network-parameters
status

See also
add ipv6-address
remove ipv6-address
set ipv6-network-parameters
show ipv6-network-parameters

show ipv6-network-parameters

Description
Shows the IPv6 settings and health of each controller module's network port.

Minimum role
monitor

Syntax
show ipv6-network-parameters

Output
Autoconfig
- enabled: Uses an IPv6 address computed by SLAAC or assigned by a DHCPv6 server, depending on the network configuration. If a DHCPv6 address is available, then that address is used. Otherwise SLAAC is used.
- disabled: Uses static IPv6 addresses set with the add ipv6-address command.

Gateway
The network port gateway IPv6 address.

Link-Local Address
The link-local IPv6 address.

Autoconfig IP
The automatically configured IPv6 address.

IPv6 Address (1-4)
Shown if Autoconfig is disabled. Shows between one and four manually set IPv6 addresses.

IPv6 Label (1-4)
Shown if Autoconfig is disabled. Shows the user-defined name, if set, for each manual IPv6 address.

Examples
Show IPv6 network parameters for each controller module.

# show ipv6-network-parameters

Basetypes
ipv6-network-parameters
status
show iscsi-parameters

Description
Shows system-wide parameters for iSCSI host ports in each controller module.

Minimum role
monitor

Syntax
show iscsi-parameters

Output
CHAP
Shows whether Challenge-Handshake Authentication Protocol (CHAP) is enabled or disabled.
- Enabled: CHAP is enabled.
- Disabled: CHAP is disabled.

Jumbo Frames
Shows whether support for jumbo frames is enabled or disabled.
- Enabled: Jumbo-frame support is enabled.
- Disabled: Jumbo-frame support is disabled.

iSNS
Shows whether support for Internet Storage Name Service (iSNS) is enabled or disabled.
- Enabled: iSNS support is enabled.
- Disabled: iSNS support is disabled.

iSNS IP
The address of the iSNS server. The default address is all zeroes.

iSNS Alt IP
The address of the alternate iSNS server. The default address is all zeroes.

iSCSI Speed
The iSCSI host port link speed.
- auto: The proper speed is auto-negotiated.
- 1Gbps: The speed is forced to 1 Gbit/s, overriding a downshift that can occur during auto-negotiation with 1-Gbit/s HBAs. This setting does not apply to 10-Gbit/s HBAs.

iSCSI IP Version
- 4: iSCSI host port addresses use IPv4 format.
- 6: iSCSI host port addresses use IPv6 format.

Examples
Show system-wide parameters for iSCSI ports.
# show iscsi-parameters

Basetypes
iscsi-parameters
status

See also
set ipv6-network-parameters
set iscsi-parameters

show license

Description
Shows the status of licensed features in the storage system.

Minimum role
monitor

Syntax
show license

Output
License Key
The license key, licensing serial number, and status of licensed features. All licensed features are enabled.

### show maps

#### Description

Shows information about mappings between volumes and initiators. If no parameter is specified, this command shows explicit mappings (but not default mappings) for all volumes.

In a dual-controller system, if a mapping uses corresponding ports on both controllers, such as A1 and B1, the Ports field will simply show 1.

#### Minimum role

monitor

#### Syntax

```plaintext
show maps
[all]
[initiator]
[IDs]
```

#### Parameters

**all**

Optional. Shows mappings of all access types: read-write, read-only, no-access, and not-mapped (default mappings). If this parameter is omitted, mappings of type not-mapped are not shown.

**initiator**

Optional. Shows mapping information by initiator. If this parameter is omitted, mapping information is shown by volume.

**IDs**

Optional. A comma-separated list of the names or serial numbers of host-type items (initiators, hosts, and host groups) or volume-type items (volumes and volume groups) for which to show mappings. If a volume is mapped to a host group, to see mappings you must specify the host group, not a host or initiator in the group. If a volume is mapped to a host, to see mappings you must specify the host, not an initiator in the group.

You can specify:

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

Do not include both host-type and volume-type items in a list. A name that includes a space must be enclosed in double quotes.

#### Output

Properties are described in alphabetical order.

**Access**

Type of host access to the volume:

- **read-write**: Read and write.
- **read-only**: Read only.
- **no-access**: No access (masked).
- **not-mapped**: Not mapped.

**Group Name**

For a volume group, its name in the format `volume-group.*`, where * represents all volumes in the group.

**ID**

Shown by the `initiator` parameter. For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).
Host-Port-Identifier (v2) For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).

- all other initiators: The volume's default mapping.

Identifier (v3)

See Host-Port-Identifier, above.

Initiator-Identifier

Shown for a volume group mapping.

- For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).
- all other initiators: The volume's default mapping.

LUN

- The LUN that identifies the volume to a host.
- For a volume group, * means multiple LUNs are represented in the group.
- Blank if not mapped or mapped as no-access.

Name

The name of a volume or initiator.

Nickname

- For a host, its name in the format host-name.*, where the * represents all initiators in the host.
- For a host group, its name in the format host-group.*.*, where the first * represents all hosts in the host group and the second * represents all initiators in those hosts.
- Blank if not set or for all other initiators/

Ports

- The controller host ports to which the mapping applies.
- Blank if not mapped or mapped as no-access.

Profile

Standard: Default profile.

Serial Number

The serial number of the volume group or volume.

Volume

- For a volume, its name.
- For a volume group, its name in the format volume-group.*, where the * represents all volumes in the group.

Examples

Show mappings for all volumes.

# show maps

Show mapping information for all initiators.

# show maps initiator

Show mappings for volume group VGroup1 and ungrouped volume v1.

# show maps VGroup1.*,v1

Basetypes

initiator-view
host-group-view
host-view-mappings
volume-group-view
volume-group-view-mappings
volume-view
volume-view-mappings
status

See also
- show host-groups
- show initiators
- show volume-groups
- show volumes

show network-parameters

Description
Shows the settings and health of each controller module’s network port

Minimum role
monitor

Syntax
show network-parameters

Output
IP Address
The network port IP address.

Gateway
The network port gateway IP address.

Subnet Mask
The network port IP subnet mask.

MAC Address
The controller’s unique Media Access Control address.

Addressing Mode
- Manual: Network settings are set manually (statically).
- DHCP: DHCP is used to set network parameters.

Link Speed
- Unknown: For a system operating in Single Controller mode, this controller module is not present.
- 10mbps: The network port link speed is set to 10 Mb/s.
- 100mbps: The network port link speed is set to 100 Mb/s.
- 1000mbps: The network port link speed is set to 1000 Mb/s.

Duplex Mode
- Undefined: For a system operating in Single Controller mode, this controller module is not present.
- half: The network port duplex mode is set to half duplex.
- full: The network port duplex mode is set to full duplex.

Auto Negotiation
- Disabled: Either the network port has not been set, or it has been unset because the controller module was removed from its enclosure, or the port is connected to a switch and is set to use the link speed and duplex mode shown by the Link Speed and Duplex Mode fields.
- Enabled: The network port is set to auto-negotiate a link speed (up to the maximum speed shown by the Link Speed field) and duplex mode with a connected Ethernet switch.

Health
The health of the network connection.
- OK
- Degraded
- Fault
- N/A
- Unknown

Health Reason
If Health is not OK, this field shows the reason for the health state.

**Health Recommendation**

If Health is not OK, this field shows recommended actions to take to resolve the health issue.

### Examples

Show network parameters for each controller module.

```
# show network-parameters
```

### Basetypes

- `network-parameters`
- `status`

### See also

- `set network-parameters`

---

**show ntp-status**

**Description**

Shows the status of the use of Network Time Protocol (NTP) in the system.

**Minimum role**

monitor

**Syntax**

```
show ntp-status
```

**Output**

- **NTP Status**
  - activated: NTP is enabled.
  - deactivated: NTP is disabled.
- **NTP Server Address**
  - The network address of the current NTP server if NTP is enabled.
  - The network address of the last-set NTP server if NTP was enabled and has been disabled.
  - 0.0.0.0 if the NTP server IP address has not been set.
- **Last Server Contact**
  The date and time in the format `year-month-day hour:minutes:seconds` of the last message received from the NTP server, or none.

**Examples**

Show NTP status for the system.

```
# show ntp-status
```

### Basetypes

- `ntp-status`
- `status`

### See also

- `set controller-date`

---

**show peer-connection**

**Description**

Shows information about a peer connection between two systems. You can run this command on either the local or remote system.

**Minimum role**

monitor

**Syntax**

```
show peer-connection
[verify-links]
peer-connection-ID
```

**Parameters**

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
```

**Examples**

Show peer connection information for the system.

```
# show peer-connection
```

---

**Alphabetical list of commands**

209
Optional. Specifies the name or serial number of the peer connection for which to show information. If this parameter is not specified the command shows information for all peer connections.

**Output**

Peer Connection Name
The name of the peer connection.

Peer Connection Type
The type of ports being used for the peer connection:
- FC: FC ports.
- iSCSI: iSCSI ports.

Connection Status
- Online: The systems have a valid connection.
- Offline: No connection is available to the remote system.

Health
- OK
- Fault
- Unknown

Health Reason
If Health is not OK, this field shows the reason for the health state.

Health Recommendation
If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Local Port
The IDs of ports in the local system.

Port Address
The assigned port address.

Remote Port
The IDs of ports in the remote system.

Reachable Remote Links
Shown by the `verify-links` parameter. The IDs of linked ports in the remote system.

Reachable Local Links
Shown by the `verify-links` parameter. The IDs of linked ports in the local system.

**Examples**

Show information for all peer connections.
```
# show peer-connections
```

Show information for peer connection Peer1.
```
# show peer-connections Peer1
```

Show information for peer connection Peer1 and the ports that can be seen from each port.
```
# show peer-connections Peer1 verify-links
```

**Basetypes**

`peer-connections`

`status`

**See also**

`create peer-connection`

`delete peer-connection`

`query peer-connection`

`set peer-connection`
show pools

Description
Shows information about linear and virtual pools. The command will show information for all pools by default, or you can use parameters to filter the output. The system can have a maximum of two virtual pools. The system can have a maximum of two virtual pools.

NOTE: For a virtual pool, new data will not be written to, or existing data migrated to, a degraded disk group unless it is the only disk group having sufficient available space for the data.

Minimum role
monitor

Syntax
show pools
[type linear|virtual]
[pool]
type linear|virtual
Optional. Specifies whether to show information for linear pools or for virtual pools. If this parameter is omitted, information will be shown for both types.
pool
Optional. The name or serial number of the pool for which to show information. If this parameter is omitted, information is shown for all pools

Output
Name
The name of the pool.
Serial Number
The serial number of the pool.
Class
• Linear: Linear pool.
• Virtual: Virtual pool.
Total Size
The total capacity of the pool.
Avail
The available capacity in the pool.
Snap Size
The pool capacity used by linear snap pools or virtual snapshots
OverCommit
• Enabled: The 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.

```
# show pools
```

Show information about virtual pools.

```
# show pools type virtual
```

Basetypes

- pools
- disk-groups
- tiers

See also

- delete pools
- set pool
- show pool-statistics

**show pool-statistics**

**Description**

Shows live or historical performance statistics for virtual pools. For pool performance statistics, the system samples live data every 30 seconds and historical data every 5 minutes, and retains historical data for 6 months.

The historical option allows you to specify a time range or a number (count) of data samples to include. It is not recommended to specify both the time-range and count parameters. If both parameters are specified, and more samples exist for the specified time range, the samples' values will be aggregated to show the required number of samples.
Statistics shown only in API output are described in API basetype properties.

**Minimum role**

monitor

**Syntax**

To show live statistics:

```
show pool-statistics
[pools pool]
[tier performance|standard|archive|readcache]
```

To show historical statistics:

```
show pool-statistics
[all]
[count number-of-data-samples]
[filename filename.csv]
historical
[pools pool]
[tier performance|standard|archive|readcache]
[time-range "date/time-range"]
```

**Parameters**

all

Optional. Specifies to show the full set of performance metrics. If this parameter is omitted, the default set of performance metrics will be shown.

count number-of-data-samples

Optional. Specifies the number of data samples to display, from 1 to 100. Each sample will be shown as a separate row in the command output. If this parameter is omitted, 100 samples will be shown. If you specify this parameter, do not specify the time-range parameter.

filename filename.csv

Optional. Specifies to save historical statistics, in CSV format, to a file on the controller. To access the file, use SFTP or FTP.

historical

Optional. Specifies to show historical statistics. If this parameter is omitted, live statistics will be shown.

pools pool

Optional. Specifies the name or serial number of the virtual pool for which to show information. If this parameter is omitted, information will be shown for both pools A and B. A name that includes a space must be enclosed in double quotes.

tier performance|standard|archive|readcache

Optional. Specifies the tier for which to show statistics.

time-range "date/time-range"

Optional. Specifies the date/time range of historical statistics to show, in the format "start yyyy-mm-dd hh:mm[AM| PM] end yyyy-mm-dd hh:mm[AM|PM]". If the start date/time is specified but no end date/time is specified, the current date/time will be used as the end date/time. The system will return the oldest sample taken after the start time and the latest sample taken before the end time. If the specified start date/time is earlier than the oldest sample, that sample will be used as the start date/time. If you specify this parameter, do not specify the count parameter. If this parameter is omitted, the most recent 100 data samples will be displayed.

disks

Optional. Specifies a comma-separated list of disks for which to show information. If this parameter is omitted, information will be shown for all disks. For disk syntax, see Command syntax.

**Output**

**Live**

Pool
The name of the pool.

Pages Allocated per Min
The rate, in pages per minute, at which pages are allocated to volumes in the pool because they need more space to store data.

Pages Deallocated per Min
The rate, in pages per minute, at which pages are deallocated from volumes in the pool because they no longer need the space to store data.

Pages Unmapped per Minute
The number of 4 MB pages that host systems have unmapped per minute, through use of the SCSI UNMAP command, to free storage space as a result of deleting files or formatting volumes on the host.

Time Since Reset
The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.

Reads
The number of read operations since these statistics were last reset or since the controller was restarted.

Writes
The number of write operations since these statistics were last reset or since the controller was restarted.

Data Read
The amount of data read since these statistics were last reset or since the controller was restarted.

Data Written
The amount of data written since these statistics were last reset or since the controller was restarted.

Bps
The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

IOPS
The number of input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

I/O Resp Time
The average response time, in microseconds, for read and write operations since the last sampling time.

Read Resp Time
Shown by the `<codeph>all</codeph>` parameter. The average response time, in microseconds, for read operations since the last sampling time.

Write Resp Time
Shown by the `<codeph>all</codeph>` parameter. The average response time, in microseconds, for write operations since the last sampling time.

Historical
For a pool:

Pool
The name of the pool.

Total I/Os
The total number of read and write operations since the last sampling time.

Reads
Shown by the `<codeph>all</codeph>` parameter. The number of read operations since the last sampling time.

Writes
Shown by the `<codeph>all</codeph>` parameter. The number of write operations since the last sampling time.
Data Transferred
The total amount of data read and written since the last sampling time.

Data Read
Shown by the <codeph>all</codeph> parameter. The amount of data read since the last sampling time.

Data Written
Shown by the <codeph>all</codeph> parameter. The amount of data written since the last sampling time.

Total IOPS
The total number of read and write operations per second since the last sampling time.

Read IOPS
Shown by the <codeph>all</codeph> parameter. The number of read operations per second since the last sampling time.

Write IOPS
Shown by the <codeph>all</codeph> parameter. The number of write operations per second since the last sampling time.

Total B/s
The total data transfer rate, in bytes per second, since the last sampling time.

Read B/s
Shown by the <codeph>all</codeph> parameter. The data transfer rate, in bytes per second, for read operations since the last sampling time.

Write B/s
Shown by the <codeph>all</codeph> parameter. The data transfer rate, in bytes per second, for write operations since the last sampling time.

Allocated Pages
The number of 4 MB pages allocated to volumes in the pool.

Sample Time
Date and time, in the format year-month-day hour:minutes:seconds, when the data sample was taken.

For each tier in the pool:

Pool
The name of the pool.

Tier
The name of the tier.

Total I/Os, Reads, Writes, Data Transferred, Data Read, Data Written, Total IOPS, Read IOPS, Write IOPS, Total B/s, Read B/s, Write B/s
As described for a pool, above.

Allocated Pages
The number of 4 MB pages allocated to volumes in the tier.

Page Moves In
The number of pages moved into this tier from a different tier.

Page Moves Out
The number of pages moved out of this tier to other tiers.

Page Rebalances
The number of pages moved between disks in this tier to automatically load balance.

Initial Allocations
The number of 4 MB pages that are allocated as a result of host writes. This number does not include pages allocated as a result of background tiering page movement. (Tiering moves pages from one tier to another, so one tier will see a page deallocated, while another tier will show pages allocated. These background moves are not considered initial allocations.)

Unmaps
The number of 4 MB pages that are automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).

RC Copies
The number of 4 MB pages copied from spinning disks to SSD read cache (read flash cache).

Zero-Pages Reclaimed
The number of empty (zero-filled) pages that were reclaimed during this sample period.

Sample Time
Date and time, in the format `year-month-day hour:minutes:seconds`, when the data sample was taken.

Examples
Show live statistics for both pools.
# show pool-statistics

Show historical statistics from a specified date and time range for pool A.
# show pool-statistics pools A historical time-range "start 2014-06-01 4:40 PM end 2014-06-01 5:00 PM"

Show all samples of historical statistics for the Standard tier in pool A.
# show pool-statistics historical all pools A tier standard

Basetypes

pool-statistics (live)
resettable-statistics (live)
tier-statistics (live)
pool-summary (historical)
pool-hist-statistics (historical)
tier-summary (historical)
tier-hist-statistics (historical)
readcache-hist-statistics (historical)
status

See also
reset all-statistics
reset pool-statistics
show pools

**show ports**

Description
Shows information about host ports in each controller.

Minimum role
monitor

Syntax
show ports
[detail]

Parameters
detail
Optional. This parameter shows additional detail about the port status, including SFP information.

Output
Ports
Controller ID and port number

**Media**
- **FC(P):** Fibre Channel Point-to-Point
- **FC(L):** Fibre Channel-Arbitrated Loop (public or private)
- **FC(-):** Not applicable, as when the port is disconnected
- **SAS:** Serial Attached SCSI
- **iSCSI:** Internet SCSI

**Target ID**
For an FC port, its WWPN. For a SAS port, its WWPN. For an iSCSI port, its node name (typically the IQN).

**Status**
- **Up:** The port is cabled and has an I/O link.
- **Warning:** Not all of the port’s PHYs are up.
- **Error:** The port is reporting an error condition.
- **Not Present:** The controller module is not installed or is down.
- **Disconnected:** Either no I/O link is detected or the port is not cabled.

**Speed(A)**
- Actual link speed in Gbit/s.
- Blank if not applicable.

**Speed(C)**
Configured host-port link speed in Gbit/s. Not shown for SAS.
- **FC:** Auto, 16Gb, 8Gb, or 4Gb
- **iSCSI:** Auto
- Blank if not applicable

**Health**
- **OK**
- **Degraded**
- **Fault**
- **N/A**
- **Unknown**

**Reason**
If Health is not **OK**, this field shows the reason for the health state.

**Action**
If Health is not **OK**, this field shows recommended actions to take to resolve the health issue.

**Topo (C)**
FC and SAS only. Configured topology.

**Lanes Expected**
SAS only. If the `detail` parameter is specified, this field shows the expected number of PHY lanes in the SAS port.

**Active Lanes**
SAS only. If the `detail` parameter is specified, this field shows the number of active lanes in the SAS port. If the port is connected and fewer lanes are active than are expected, the port status will change to Warning, the health will change to Degraded, and event 354 will be logged.

**Disabled Lanes**
SAS only. If the `detail` parameter is specified, this field shows the number of disabled lanes in the SAS port.
FC only. If the detail parameter is specified, this field is shown. If the port is using loop topology and the port status is Up, this field shows the primary loop ID. If the port is not using loop topology or the port status is not Up, this field shows N/A.

IP Version
iSCSI only. IPv4 or IPv6.

IP Address
iSCSI only. Assigned port IP address.

Gateway
iSCSI only. For IPv4, gateway IP address for assigned IP address.

Netmask
iSCSI only. For IPv4, subnet mask for assigned IP address.

Default Router
iSCSI only. For IPv6, default router for assigned IP address.

Link-Local Address
iSCSI only. For IPv6, the link-local address that is automatically generated from the MAC address and assigned to the port.

MAC
iSCSI only. Unique Media Access Control (MAC) hardware address, also called the physical address.

SFP Status
If the detail parameter is specified, this field shows the SFP status:

• OK
• Not present: No SFP is inserted in this port.
• Not compatible: The SFP in this port is not qualified for use in this system. When this condition is detected, event 464 is logged.
• Incorrect protocol: The SFP protocol does not match the port protocol. When this condition is detected, event 464 is logged.

Part Number
If the detail parameter is specified, this field shows the SFP part number.

Supported Speeds
FC only. If the detail parameter is specified, this field shows the link speeds that the SFP supports.

10G Compliance
iSCSI only. If the detail parameter is specified, this field shows the SFP’s 10G compliance code. If the SFP returns an unsupported code, this field will show the equivalent hex value.

Ethernet Compliance
iSCSI only. If the detail parameter is specified, this field shows the SFP’s Ethernet compliance code. If the SFP returns an unsupported code, this field will show the equivalent hex value.

Cable Technology
iSCSI only. If the detail parameter is specified, this field shows whether the SFP supports active or passive cable technology.

Cable Length
iSCSI only. If the detail parameter is specified, this field shows the link length (in meters) that is supported by the SFP while operating in compliance with applicable standards for the cable type.

Examples
Show information about host ports in each controller module.

# show ports

Show detailed information about host ports in each controller module.

# show ports detail
### show power-supplies

**Description**
Shows information about each power supply in the storage system.

**Minimum role**
monitor

**Syntax**
show power-supplies

**Output**

- **Encl**
  The ID of the enclosure that contains the power supply.

- **Id**
  The power supply position, shown as an index value that starts at 0 and increments from left to right as viewed from the back of the enclosure.

- **Serial Number**
  The serial number of the power supply.

- **Part Number**
  - (blank): Not applicable.
  - Name
    The power supply identifier and location.

- **Firmware Version**
  - (blank): Not applicable.
  - The firmware revision of the power supply.

- **Health**
  - OK
  - Degraded
  - Fault
  - N/A
  - Unknown

- **Reason**
  If Health is not OK, this field shows the reason for the health state.

- **Action**
  If Health is not OK, this field shows recommended actions to take to resolve the health issue.

**Examples**
Show information about each power supply in each enclosure.

```bash
# show power-supplies
```

**Basetypes**

- power-supplies
- fan
- status

**See also**

- show fans
- show frus
show protocols

**Description**
Shows which management services and protocols are enabled or disabled.

**Minimum role**
monitor

**Syntax**
```
show protocols
```

**Output**

### Web Browser Interface (HTTP)

Shows whether the standard MESM web server is enabled or disabled.

### Secure Web Browser Interface (HTTPS)

Shows whether the secure MESM web server is enabled or disabled.

### Command Line Interface (Telnet)

Shows whether the standard CLI is enabled or disabled.

### Secure Command Line Interface (SSH)

Shows whether the secure shell CLI is enabled or disabled.

### Storage Management Initiative Specification (SMI-S)

Shows whether the secure SMI-S interface is enabled or disabled. When enabled, this option allows SMI-S clients to communicate with each controller’s embedded SMI-S provider via HTTP port 5989.

### Unsecure Storage Management Initiative Specification (SMI-S 5988)

Shows whether the unsecure SMI-S interface is enabled or disabled. When enabled, this option allows SMI-S clients to communicate with each controller’s embedded SMI-S provider via HTTP port 5988.

### Service Location Protocol (SLP)

Shows whether the SLP interface is enabled or disabled.

### File Transfer Protocol (FTP)

Shows whether the unsecure secondary interface for installing firmware updates, installing security certificates and keys and downloading logs is enabled or disabled.

### SSH File Transfer Protocol (SFTP)

Shows whether the secure secondary interface for installing firmware updates, installing security certificates and keys and downloading logs is enabled or disabled.

### Simple Network Management Protocol (SNMP)

Shows whether the SNMP interface is enabled or disabled. When this is disabled, all SNMP requests to the MIB are disabled and SNMP traps are disabled.

### Service Debug

Shows whether the Telnet debug port is enabled or disabled.

### In-band SES Management (SES)

Shows whether the in-band SES interface is enabled or disabled.

### Activity Progress Reporting (activity)

Shows whether access to the activity progress interface via HTTP port 8081 is enabled or disabled. This mechanism reports whether a firmware update or partner firmware update operation is active and shows the progress through each step of the operation. In addition, when the update operation completes, status is presented indicating either the successful completion, or an error indication if the operation failed.

### Management Mode

Shows the default management mode.

- **Linear**: Uses linear-storage terminology in command output and system messages. For example, vdisk for disk groups and pools.
- **Virtual**: Uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, disk group for disk groups and pool for pools.
To see the management mode for the current CLI session, which can be set differently than the default, use the `show cli-parameters` command.

**SSH Port**

Shows the port number used for SSH.

**SFTP Port**

Shows the port number used for SFTP.

### Examples

Show the status of service and security protocols.

```
# show protocols
```

### Basetypes

- `security-communications-protocols`
- `communication-ports`
- `status`

### See also

- `set protocols`
- `show cli-parameters`

## show provisioning

### Description

Shows information about how the system is provisioned. This command shows the associations between controllers, disks, disk groups or pools, volumes, and mappings. The command will show information for all associations by default, or you can use parameters to filter the output.

This command is useful for the following purposes:

- You want a quick overview of how the system is provisioned.
- You know of a disk-related issue (perhaps from the event log) and want to understand what components it may be impacting. You can use this command to see which volume WWNs are affected, which you can use on the host to determine which device node might be seeing errors.
- You know of a volume-level issue and want to determine which associated components to investigate. You can use this command to quickly see which controller owns the volume and which disks are associated with the volume. For example, perhaps at the OS level, a certain device node (target) looks “slow” relative to the rest of the targets. You can correlate the OS device node to the volume WWN (or LUN), and then use the command output to find the associated controller and disks.

### Minimum role

`monitor`

### Syntax

```
show provisioning
[disks disks | luns LUNs | pool pools | ports ports | vdisks vdisks | volumes volumes] [no-mapping]
[unhealthy]
```

### Parameters

- **disks disks**
  
  Optional. Shows provisioning information for the specified list of disks. For disk syntax, see [Command syntax](#). This command does not support the use of hyphens to indicate a range of disks.

- **luns LUNs**
  
  Optional. Shows provisioning information for the specified list of LUNs.

- **no-mapping**
  
  Optional. Shows the Mapped field but no other mapping information. If this parameter is omitted, all mapping information is shown.

- **pool pools**
  
  Optional. Shows provisioning information for the specified list of pools. A name that includes a space must be enclosed in double quotes.

- **ports ports**
  
  Optional. Shows provisioning information for the specified list of ports.
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.

vdisksvdisks

Optional. For linear storage, this shows provisioning information for the specified list of disk groups. A name that includes a space must be enclosed in double quotes.

volumesvolumes

Optional. Shows provisioning information for the specified list of volumes. A name that includes a space must be enclosed in double quotes.

unhealthy

Optional. Shows provisioning information for disk groups or pools whose health is not OK. If this parameter is omitted, provisioning information is shown for all disk groups or pools.

Output

Volume information:

Volume

• Volume name.
• Blank if the disk group or pool does not have a volume.

WWN

• Volume World Wide Name.
• Blank if the disk group or pool does not have a volume.

Ctrlr

Owning controller of the disk group or pool.

Disks

Shorthand list of the disks within a disk group or pool.

Pool (v3)

Pool name.

Vdisk (v2)

Disk group name.

Health

• OK
• Degraded
• Fault
• N/A
• Unknown

Mapped

Indicates whether the volume is mapped. This is useful when the no-mapping parameter is specified to hide detailed mapping information.

• Yes: The volume is mapped.
• No: The volume is not mapped.

Mapping information:

Ports

• Controller host ports that the mapping applies to.
• Blank if not mapped or mapped as no-access.

LUN

• LUN that identifies the volume to a host.
• Blank if not mapped or mapped as no-access.

Access

Type of host access to the volume:
• read-write: The host has read and write access to the volume.
• read-only: The host has read access to the volume.
• no-access: The host is denied access to the volume.
• not-mapped: The host is not mapped to the volume.

Host-Port-Identifier (v2) or Identifier (v3)

• For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the iQN).
• all other initiators: The volume's default mapping.

Nickname

Host nickname, or blank if not set or for all other hosts.

Profile

Standard: Default profile.

Examples

Show provisioning for the system.

# show provisioning

Show provisioning for disk group myR1.

# show provisioning vdisks myR1

Show provisioning for all unhealthy disk groups.

# show provisioning unhealthy

Basetypes

provisioning

status

See also

show disk-groups
show disks
show maps
show pools
show vdisks

show redundancy-mode

Description

Shows the redundancy status of the system.

Minimum role

monitor

Syntax

show redundancy-mode

Output

Controller Redundancy Mode

Shows the system’s operating mode, also called the cache redundancy mode:

• Independent Cache Performance Mode: For a dual-controller system, controller failover is disabled and data in a controller’s write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.

• Active-Active ULP: Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance.

• Single Controller: The enclosure contains a single controller.

• Failed Over: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy.

• Down: Both controllers are not operational.

Controller Redundancy Status
• Redundant with independent cache: Both controllers are operational but are not mirroring their cache metadata to each other.
• Operational but not redundant: In active-active mode, one controller is operational and the other is offline. In single-controller mode, the controller is operational.
• Redundant: Both controllers are operational.
• Down: This controller is not operational.
• Unknown: Status information is not available.

Controller ID Status
• Operational: The controller is operational.
• Down: The controller is installed but not operational.
• Not Installed: The controller is not installed.

Controller ID Serial Number
• Controller module serial number
• Not Available: The controller is down or not installed.

Other MC Status
The operational status of the Management Controller in the partner controller. This is not factored into system health.
• Operational
• Not Operational
• Not Communicating
• Unknown

Examples
Show the redundancy status of the system.

```
# show redundancy-mode
```

Basetypes

redundancy
status

show refresh-counters

Description
In XML API format only, shows when the data represented by the basetype was last updated.
The value 0 means the data has never been updated and is not cached. A value other than 0 is a timestamp indicating that the data has been updated. If the value has changed since the last time you called this command then the data has changed.

Minimum role
monitor

Syntax
show refresh-counters

Basetypes
refresh-counters
status

See also
set cli-parameters

show remote-systems

Description
Shows information about remote systems associated with the local system. This command applies to linear storage only.

Minimum role
monitor

Syntax
show remote-systems
[system]
Parameters

system

Optional. The name or network-port IP address of the remote system about which to show information.

Output

System Name
The name of the remote system.

System Contact
The name of the person who administers the remote system.

System Location
The location of the remote system.

System Information
A brief description of the remote system.

Vendor Name
The vendor name of the remote system.

Product ID
The product model identifier of the remote system.

Product Brand
The brand name of the remote system.

IP Address Controller A
The IP address of the network port in controller A in the remote system.

IP Address Controller B
The IP address of the network port in controller B in the remote system.

Username
The name of a user with the manage role in the remote system.

Status
- Uninitialized: This system hasn’t communicated with the remote system.
- Ready: This system has contacted the remote system and it is ready to use.
- Connected: This system is transferring data to the remote system.
- Not Connected: The system is not connected to the remote system.

Last Connected
Date and time, in the format year-month-day hour:minutes:seconds (UTC), when successful communication was last established between the Management Controller in the local system and the Management Controller in the remote system. This value does not indicate when connection status was last determined, and will not be updated if the remote Management Controller is not accessible or if the connection status is Not Connected.

Examples

Show information about remote system System2.

# show remote-systems System2

Basetypes

remote-system

status

See also

delete remote-system

show replication-sets

Description

Shows information about replication sets in the peer connection. This command applies to virtual storage only. You can view information about all replication sets or a specific replication set.
For virtual storage, you can run this command on either the primary or secondary system. In console mode, this command does not show the serial numbers of items such as replication volumes. To see serial numbers, run this command in API mode.

Timestamps use the local time zone of the system on which this command is run.

**NOTE:** If you change the time zone of the secondary system in a replication set whose primary and secondary systems are in different time zones, you must restart the system to enable management interfaces to show proper time values for replication operations.

Properties shown only in API output are described in [API basetypes properties](#).

## Minimum role

monitor

## Syntax

```
show replication-sets
[replication-set-ID]
```

## Parameters

**replication-set-ID**

Optional. The name or serial number of a replication set for which to display information at the replication set level. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all replication sets.

## Output

**Overview information:**

Name
The replication set name.

Group
- **Yes:** The replication set is part of a group.
- **No:** The replication set is not part of a group.

Primary Location
The location of the primary volume in the replication set: Local or Remote.

Peer
The name of the peer connection.

Primary Volume
The primary volume name. If it is a volume group, it uses the .* notation.

Secondary Volume
The secondary volume name. If it is a volume group, it uses the .* notation

Policy
The action to take when a replication is running and a new replication is requested.
- **discard:** Discard the new replication request.
- **queue-latest:** Take a snapshot of the primary volume and queue the new replication request. If the queue contained an older replication request, discard that older request. A maximum of one replication can be queued.

Queue Count
The number of queued replications for the replication set: either 0 or 1.

Status
- **Not Ready:** The replication set is not ready for replications because the system is still preparing the replication set.
- **Unsynchronized:** The primary and secondary volumes are unsynchronized because the system has prepared the replication set, but the initial replication has not run.
- **Running:** A replication is in progress.
- **Ready:** The replication set is ready for a replication.
- **Suspended:** Replications have been suspended.
- **Unknown:** This system cannot communicate with the primary system and thus cannot be sure of the current state of the replication set. Check the state of the primary system.
Last Successful Run
The date and time when the system took a snapshot of the primary volume in preparation for starting the last successful replication run. The value shows when the primary and secondary volumes were last known to be in sync.

Last Status
The status of the last attempted replication.

**Last run or current run information:**

- **Replication**
  - Last Run or Current Run.
- **Progress**
  - The percentage complete for an active replication. Otherwise, N/A.
- **Data Transferred**
  - The total number of bytes transferred.
- **Start Time**
  - The date and time when the replication started.
- **End Time**
  - For the last run, the date and time when the replication ended.
- **Estimated Completion Time**
  - For the current run, the date and time when the replication is estimated to end.
- **Run Error**
  - A message that says whether the replication succeeded or an error occurred.

**Examples**
Show information about all replication sets.

```bash
# show replication-sets
```
Show information about replication set RS1.

```bash
# show replication-sets RS1
```

**Basetypes**
- `cs-replication-set`
- `status`

**See also**
- `create replication-set`
- `delete replication-set`
- `resume replication-set`
- `set replication-set`
- `suspend replication-set`

**show replication-snapshot-history**

**Description**
Shows information about the snapshot history for all replication sets or a specific replication set.

You can run this command on either the primary or secondary system to see snapshot-history settings for a replication set and details about local replication snapshots.

In console mode, this command does not show the serial numbers of items such as replication volumes. To see serial numbers, run this command in API mode.

**Minimum role**
- `monitor`

**Syntax**

```bash
show replication-snapshot-history [replication-set-ID]
```
Parameters

replication-set-ID

Optional. The name or serial number of a replication set for which to display information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all replication sets.

Output

Snapshot settings:

Replication Set
The replication set name.

Snapshot History
- disabled or off: A snapshot history will not be kept.
- secondary: A snapshot history set will be kept on the secondary system for the secondary volume, using snapshot-count and snapshot-basename settings.
- both: A snapshot history will be kept for the primary volume on the primary system and for the secondary volume on the secondary system. Both snapshot histories will use the same snapshot-count and snapshot-basename settings.

Count
The number of snapshots to retain in snapshot history. When a new snapshot exceeds this limit, the oldest snapshot in the snapshot history is deleted.

Basename
The user-defined prefix for the snapshots.

Retention Priority
The retention priority for snapshots, which is used when automatic deletion of snapshots is enabled by using the set snapshot-space command. In a snapshot tree, only leaf snapshots can be deleted automatically. Deletion based on retention priority is unrelated to deleting the oldest snapshots to maintain a snapshot count.
- never-delete: Snapshots will never be deleted automatically to make space. The oldest snapshot in snapshot history will be deleted once the snapshot-count has been exceeded.
- high: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted.
- medium: Snapshots can be deleted after all eligible low-priority snapshots have been deleted.
- low: Snapshots can be deleted.

Snapshot information:

Local Snapshot
The snapshot name.

Creation Date/Time
The date and time when the snapshot was prepared or committed.

Snap Data
The total amount of write data associated with the snapshot.

Unique Data
The amount of write data that is unique to the snapshot.

Examples

Show snapshot-history information for all replication sets.
# show replication-snapshot-history

Show snapshot-history information for replication set RS1.
# show replication-snapshot-history RS1

Basetypes
replication-snapshot-history
current-replication-snapshots
status

See also
show replication-sets
show snapshosts

**show sas-link-health**

**Description**
Shows the condition of SAS expansion-port connections.

**Minimum role**
Monitor

**Syntax**
show sas-link-health

**Output**
Encl
The enclosure ID.
Ctlr
The ID of the controller module or expansion module.

**Name**
- Out Port: Egress (expansion) port in a controller module or an expansion module. Can be connected to an ingress port in an expansion module.
- In Port: Ingress port in an expansion module. Can be connected to an egress (expansion) port in a controller module or an expansion module.
- Universal Port: Port that can function as either an egress or ingress port in a controller module or an expansion module.

**Status**
- Up: The port is cabled and has an I/O link.
- Warning: Not all of the port's PHYs are up.
- Error: The port is reporting an error condition.
- Not Present: The controller module is not installed or is down.
- Disconnected: Either no I/O link is detected or the port is not cabled.

**Health**
- OK
- Degraded
- Fault
- N/A
- Unknown

**Reason**
If Health is not OK, this field shows the reason for the health state.

**Action**
If Health is not OK, this field shows recommended actions to take to resolve the health issue.

**Examples**
Show the condition of SAS expansion-port connections in each enclosure.

# show sas-link-health

**Basetypes**
expander-ports
status

**show schedules**

**Description**
Shows information about all task schedules.

**Minimum role**
Monitor

**Syntax**
show schedules

Alphabetical list of commands 229
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.

**Output**

- **Name**
  - Showed by default. The schedule name.

- **Schedule Name**
  - Showed by the `detail` parameter. The schedule name.

- **Specification**
  - Showed by default. The schedule settings for running the associated task.

- **Schedule Specification**
  - Showed by the `detail` parameter. The schedule settings for running the associated task.

- **Status**
  - **Uninitialized**: The task is not yet ready to run.
  - **Ready**: The task is ready to run at the next scheduled time.
  - **Suspended**: The task had an error and is holding in its current state.
  - **Expired**: The task exceeded a constraint and will not run again.
  - **Invalid**: The task is invalid.
  - **Deleted**: The task has been deleted.

- **Next Time**
  - The date and time, in the format `year-month-day hour:minutes:seconds (UTC)`, when the schedule will next run.

- **Task To Run**
  - The name of the task that the schedule runs.

- **Error Message**
  - If an error occurred while processing the task, the error message.
  - Blank if no error occurred.

- **Task-specific information, as shown by the `set task` command. Showed by the `detail` parameter.**

**Examples**

Show information about all task schedules.

```
# show schedules
```

Show information about schedule Sched2.

```
# show schedules Sched2
```

**Basetypes**

- `schedules`
- `status`

**See also**

- `create schedule`
- `delete schedule`
- `set schedule`
- `show tasks`
show sensor-status

Description
Shows information about each environmental sensor in each enclosure. Information shown includes overall unit (enclosure) status, and temperature, voltage, charge, and current as applicable for enclosure components. For temperature and voltage ranges (both normal and error), see your product’s installation documentation.

Minimum role
monitor

Syntax
show sensor-status

Output
Encl
The enclosure ID.
Drawer
The drawer ID.
Sensor Name
The sensor name and location.
Value
• For a sensor, its value.
• For Overall Unit Status, one of the status values below.

Status
• OK: The sensor is present and detects no error condition.
• Warning: The sensor detected a non-critical error condition. Temperature, voltage, or current is between the warning and critical thresholds.
• Critical: The sensor detected a critical error condition. Temperature, voltage, or current exceeds the critical threshold.
• Unavailable: The sensor is present with no known errors, but has not been turned on or set into operation because it is initializing. This typically occurs during controller startup.
• Unrecoverable: The enclosure management processor (EMP) cannot communicate with the sensor.
• Unknown: The sensor is present but status is not available.
• Not Installed: The sensor is not present.
• Unsupported: Status detection is not implemented.

Examples
Show the status of each environmental sensor in each enclosure.
# show sensor-status

Basetypes
sensors
status

show service-tag-info

Description
Shows the storage system's service tag identifier.

Minimum role
monitor

Syntax
show service-tag-info

Output
An alphanumeric string that uniquely identifies the product

Examples
Show the storage system's service tag.
# show service-tag-info

Basetypes
service-tag-info
status
show sessions

**Description**

Shows information about user sessions on the storage system.

When an active session reaches its timeout (1800 seconds by default), the session will be marked as expired, and will be removed 30 seconds later. If you reset the system, all sessions will be removed.

This information is for reference as a security measure.

**Minimum role**

manage

**Syntax**

show sessions

[detail]

detail

Optional. Shows additional information about user sessions.

**Output**

**Username**

The name of the user for which session information is shown.

**Interface**

Shows whether the session is using the CLI or the MESM.

**Locale**

The display language.

**Host**

For a CLI session, the connected system’s IP address and port number.

**State**

Shown by the `detail` parameter. Shows whether the session is active or expired.

**Timeout**

Shown by the `detail` parameter. The time in seconds that the session can be idle before it automatically ends.

**Idle Time**

The time in seconds that the session has been idle.

**First Access**

Shown by the `detail` parameter. The date and time when the session started.

**Last Access**

Shown by the `detail` parameter. The date and time when the session was last accessed. It updates to the current time when a command is issued.

**Examples**

Show active sessions on the storage system.

```
# show sessions
```

**Basetypes**

sessions

status

show shutdown-status

**Description**

Shows whether each Storage Controller is active or shut down.

**Minimum role**

monitor

**Syntax**

show shutdown-status

**Output**

Controller A
• up: The controller is operational.
• down: The controller is shut down.
• not installed: The controller is not installed.

Controller B
• up
• down
• not installed

Other MC Status
The operational status of the Management Controller in the partner controller. This is not factored into system health
• Operational
• Not Operational
• Not Communicating
• Unknown

Examples
Show the shutdown status of each controller.

# show shutdown-status

Basetypes
show-other-MC-status
shutdown-status
status

See also
restart mc
restart sc
shutdown

show snapshot-space

Description
Shows snapshot-space settings for each virtual pool. This includes space used by replication snapshots.

Minimum role
monitor

Syntax
show snapshot-space

Output
Pool
The pool for which information is displayed (A or B).
Limit (%Pool)
The percentage of the pool that can be used for snapshots (the snapshot space).
Limit Size
The actual size of the snapshot space.
Allocated (%Pool)
The percentage of the pool currently used by snapshots.
Allocated (%Snapshot Space)
The percentage of the snapshot space currently used by snapshots.
Allocated Size
The actual amount of space currently used by snapshots.
Low Threshold (%Snapshot Space)
A percentage of the snapshot space designated as the low threshold.
Middle Threshold (%Snapshot Space)
A percentage of the snapshot space designated as the middle threshold.

High Threshold (%Snapshot Space)
A percentage of the snapshot space designated as the high threshold.

Limit Policy
The limit policy for when the percentage of the pool designated for snapshots is reached.

- notify-only: When the snapshot space is reached an event is generated and logged.
- delete: When the snapshot space is reached an event is generated and logged and automatic deletion of snapshots occurs.

Examples
Show snapshot-space settings for each virtual pool.

# show snapshot-space

Basetypes
snap-space
status

See also
set snapshot-space
set snapshot-space

show snapshots

Description
Shows information about snapshots. The command will show information for all snapshots by default, or you can use parameters to filter the output.

Minimum role
monitor

Syntax
show snapshots
[pattern string]
[pool pool]
[type standard|replication|all]
[volume volume]

Parameters
pattern string
Optional. Shows snapshots whose names contain the specified string. The string can include the following wildcards, singly or in combination.

* Matches zero or more characters.
? Matches any one character. Use multiple '?' wildcards to find names of a specific length. For example, Vol?? will find names starting with Vol that are five characters long.
[] Matches any character within the brackets, except a hyphen. Alphabetic characters are case sensitive. For example,
[123] matches 1, 2, or 3. Use a hyphen between two characters to specify a range. For example, [0-9] matches any one digit. You can combine the list and range forms. For example, [xy1-3] matches x or y (but not X or Y), or 1, 2, or 3.

pool pool
Optional. Specifies the name or serial number of the pool that contains the snapshots for which to show information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for snapshots in all pools.

type standard|replication|all
Optional. Shows only standard snapshots, only replication snapshots, or snapshots of all types. If this parameter is omitted, snapshots of all types are shown.

volume volume
Optional. Shows snapshots associated with the specified volume name or serial number. A name that includes a space must be enclosed in double quotes.

<table>
<thead>
<tr>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool</td>
</tr>
<tr>
<td>The name of the pool that contains the snapshot.</td>
</tr>
<tr>
<td>Serial Number</td>
</tr>
<tr>
<td>Snapshot serial number</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>The name of the snapshot.</td>
</tr>
<tr>
<td>Creation Date/Time</td>
</tr>
<tr>
<td>The date and time when the snapshot was prepared or committed.</td>
</tr>
<tr>
<td>Status</td>
</tr>
<tr>
<td>- Available</td>
</tr>
<tr>
<td>- Unavailable: See the Status-Reason value.</td>
</tr>
<tr>
<td>Status-Reason</td>
</tr>
<tr>
<td>Shows N/A for Available status, or one of the following reasons for Unavailable status:</td>
</tr>
<tr>
<td>- snapshot not found</td>
</tr>
<tr>
<td>- master volume not found</td>
</tr>
<tr>
<td>- snapshot pending (not yet committed)</td>
</tr>
<tr>
<td>- master volume not accessible</td>
</tr>
<tr>
<td>- Volume copy with modified data is in progress</td>
</tr>
<tr>
<td>- Unknown reason</td>
</tr>
<tr>
<td>Parent Volume</td>
</tr>
<tr>
<td>The name of the volume of which the snapshot was taken.</td>
</tr>
<tr>
<td>Base Vol</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Snaps</td>
</tr>
<tr>
<td>The number of child snapshots (snapshots taken of this snapshot).</td>
</tr>
<tr>
<td>TreeSnaps</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Snap-Pool</td>
</tr>
<tr>
<td>Not applicable.</td>
</tr>
<tr>
<td>Snap Data</td>
</tr>
<tr>
<td>The total amount of write data associated with the snapshot.</td>
</tr>
<tr>
<td>Unique Data</td>
</tr>
<tr>
<td>The amount of write data that is unique to the snapshot.</td>
</tr>
<tr>
<td>Shared Data</td>
</tr>
<tr>
<td>The amount of write data that is shared between this snapshot and other snapshots.</td>
</tr>
<tr>
<td>Retention Priority</td>
</tr>
<tr>
<td>The retention priority for the snapshot.</td>
</tr>
<tr>
<td>- never-delete: Snapshots will never be deleted.</td>
</tr>
<tr>
<td>- high: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted.</td>
</tr>
<tr>
<td>- medium: Snapshots may be deleted after all eligible low-priority snapshots have been deleted.</td>
</tr>
<tr>
<td>- low: Snapshots may be deleted.</td>
</tr>
</tbody>
</table>
Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion.

**Examples**

Show information about all snapshots.

```
# show snapshots
```

Show information about snapshots of volume `vol2`.

```
# show snapshots volume vol2
```

Show snapshots whose names include `snap` followed by an underscore and a two-digit number — such as `VolAsnap_01` or `snap_10`, but not `snapVolA_01` or `Snap_1`.

```
# show snapshots pattern *snap_[0-9][0-9]
```

**Basetypes**

- `snapshots`
- `status`

**See also**

- `show pools`
- `show volumes`

### show snmp-parameters

**Description**

Shows SNMP settings for event notification.

**Minimum role**

`monitor`

**Syntax**

```
show snmp-parameters
```

**Output**

**SNMP Trap Notification Level**

- `crit`: Sends notifications for Critical events only.
- `error`: Sends notifications for Error and Critical events.
- `warn`: Sends notifications for Warning, Error, and Critical events.
- `resolved`: Sends notifications for Resolved, Warning, Error, and Critical events.
- `info`: Sends notifications for all events.
- `none`: No events are sent as traps and traps are disabled.

**SNMP Trap Host IP#**

The IP address of each trap host. The value can be an IPv4 address, IPv6 address, or FQDN.

**SNMP read community**

The community string for read-only access. The value is obscured for users having only the `monitor` role and is shown in clear text for users having the `manage` role.

**SNMP write community**

The community string for write access. The value is obscured for users having only the `monitor` role and is shown in clear text for users having the `manage` role.

**Examples**

Show SNMP notification settings.

```
# show snmp-parameters
```

**Basetypes**

- `snmp-parameters`
- `status`

**See also**

- `set snmp-parameters`
- `set protocols`
- `show protocols`
show support-assist

Description
Shows information about the SupportAssist feature.

Minimum role
monitor

Syntax
show support-assist

Output
SupportAssist status:

SupportAssist State
- Running – The service is enabled.
- Disabled – The service is disabled
- Paused – A user has temporarily suspended the service, preventing data transmission to the support server.

Operation Mode
- Normal – The service is operating normally.
- Maintenance – A user has put the system into maintenance mode to notify SupportAssist not to create support tickets during planned system downtime.

Specifies the status and date/time of the last transmission of system log data to the SupportAssist server.

Last Logs Send Status
Last Logs Send Time

Specifies the status and date/time of the last transmission of system event data to the SupportAssist server.

Last Event Send Status
Last Event Send Time

Proxy information:

Proxy State
- Enabled – Use of a proxy for HTTP communication is enabled.
- Disabled – Use of a proxy for HTTP communication is disabled.

Host – The IPv4 address or name of a proxy host.

Ports – The port number to use on the proxy host.

Protocol – HTTP protocol.

User Name – The proxy user name to use to access the proxy server.

Contact information:

Company Name, Company Country Territory, First Name, Last Name, Phone Number, Alternate Phone Number, Email Address, Alternate Email Address, Address Line1, Address Line2, Address Line3, Address City Town, Address Country Territory, Address State Province Region, Address Zip Postal Code, Time Zone, Preferred Contact Method, Preferred Contact Hours Start Time, Preferred Contact Hours End Time, Preferred Email Language, Preferred Email Language, Email Notifications

Examples
Show information about the SupportAssist feature.
# show support-assist

Basetypes
contact-information
proxy-information
support-assist
status

See also
check support-assist
send support-assist-logs
show syslog-parameters

**Description**
Shows syslog notification parameters for events and managed log.

**Minimum role**
monitor

**Syntax**
```
show syslog-parameters
```

**Output**
- **Syslog Host IP**
The IP address or domain name of the remote syslog server used for the notifications.
- **Syslog Notification Level**
  Shows the minimum severity for which the system sends notifications:
  - **crit**
    Sends notifications for Critical events only.
  - **error**
    Sends notifications for Error and Critical events.
  - **warn**
    Sends notifications for Warning, Error, and Critical events.
  - **resolved**
    Sends notifications for Resolved, Warning, Error, and Critical events.
  - **info**
    Sends notifications for all events.
  - **none**
    Disables syslog notification and clears the settings.
- **Syslog Host Port**
The port on which the remote syslog facility is expected to listen for notifications.

**Examples**
Show settings for remote syslog notification.
```
# show syslog-parameters
```

**Basetypes**
- `syslog-parameters`
- `status`

**See also**
- `set syslog-parameters`

---

show system

**Description**
Shows information about the storage system. If the system’s health is not OK, each unhealthy component is listed with information to help you resolve the health problem.

**Minimum role**
monitor

**Syntax**
```
show system
[detailed]
```

**Output**
- **System Name**
The name of the system.
- **System Contact**
The name of the person who administers the system.
- **System Location**
The location of the system.
- **System Information**
A brief description of what the system is used for or how it is configured.
Midplane Serial Number
The serial number of the controller enclosure midplane.
Vendor Name
The vendor name.
Product ID
The product model identifier.
Product Brand
The product brand name.
SCSI Vendor ID
The vendor name returned by the SCSI INQUIRY command.
SCSI Product ID
The product identifier returned by the SCSI INQUIRY command.
Enclosure Count
The number of enclosures in the system.
Health
- OK
- Degraded
- Fault
- N/A
- Unknown
Reason
If Health is not OK, this field shows the reason for the health state.
Other MC Status
The operational status of the Management Controller in the partner controller. This is not factored into system health.
- Operational
- Not Operational
- Not Communicating
- Unknown
PFU Status
Shows whether partner firmware update is running on the system, or is idle.
Supported Locales
Supported display languages.

Examples
Show information about the system.

```
# show system
```

Base types
```
system
status
```

See also
```
set system
show system-parameters
```

**show system-parameters**

Description
Shows certain storage-system settings and configuration limits. For a summary of the physical and logical limits of the storage system, see the “System configuration limits” appendix in the Administrator’s Guide.
**Minimum role**

monitor

**Syntax**

show system-parameters

**Output**

ULP Enabled

Shows that the system is using Unified LUN Presentation, which can expose all LUNs through all host ports on both controllers. The interconnect information is managed in the controller firmware. ULP appears to the host as an active-active storage system where the host can choose any available path to access a LUN regardless of disk group ownership. When ULP is in use, the system’s operating/cache-redundancy mode is shown as Active-Active ULP. ULP uses the T10 Technical Committee of INCITS Asymmetric Logical Unit Access (ALUA) extensions, in SPC-3, to negotiate paths with aware host systems. Unaware host systems see all paths as being equal.

Host Profiles Enabled

Shows whether host profiles are enabled.

Number of Host Ports

The number of host-interface ports in the controller enclosure.

Maximum Disks

The number of disks that the system supports.

Maximum Volumes

The number of volumes that the system supports.

Maximum Linear Disk Groups (v3)

The number of linear disk groups that the system supports.

Maximum Linear Vdisks (v2)

The number of disk groups that the system supports.

Maximum LUNs

The number of LUNs that the system supports.

Maximum Linear Disk Groups per Controller (v3)

The number of linear disk groups that each controller supports.

Maximum Linear Vdisks per Controller (v2)

The number of disk groups that each controller supports.

Maximum Virtual Pools per Controller

The number of virtual pools that each controller supports.

Maximum Virtual Disk Groups per Pool

The number of virtual pools that each pool can contain.

Maximum Virtual Pool Size

The maximum capacity of a virtual pool, formatted to use the current base, precision, and units.

Maximum Host Groups

The number of host groups that the system supports.

Maximum Hosts per Host Group

The maximum number of hosts that a host group can contain.

Maximum Initiators per Host

The maximum number of initiators that a host can contain.

Maximum Volume Groups per Controller

The maximum number of volume groups that each controller supports.

Maximum Volumes per Volume Group

The maximum number of volumes that a volume group can contain.

Local Controller
The ID of the controller you are accessing.

Serial Number
The last six digits of the midplane serial number.

Examples
Show settings and configuration limits for the storage system.

# show system-parameters

Base types
system-parameters-table
status

See also
show system

show tasks

Description
Shows information about tasks.

Minimum role
monitor

Syntax
show tasks
[detail] [task-name]
detail
Optional. Shows additional detail about each task.
task-name
Optional. Shows information about the specified task only. If this parameter is omitted, information is shown for all tasks.

Output
Any task type, no detail

Name
The name of the task.

Type
The task type.

Status
The task status. Status values for each task type are listed in the following sections.

State
The current step of the task. State values for each task type are listed in the following sections.

Error Message
• If an error occurred while processing the task, the error message.
• Blank if no error has occurred.

TakeSnapshot task, detail

Task Name
The name of the task.

Task Type
TakeSnapshot

Status
• Uninitialized: The task is not yet ready to run.
• Ready: The task is ready to run.
• Active: The task is running.
• Error: The task has an error.
- Complete: For a TakeSnapshot task only, the task is complete but not yet ready to run again.
- Deleted: The task is expired but this state is not yet synchronized to the partner controller.

**Task State**

The current step of the task:
- Start
- VerifyVolume
- CreateName
- CreateSnap
- VerifySnap
- InspectRetention
- FindOldestSnap
- UnmapSnap
- ResetSnap
- RenameSnap

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

**Source Volume**
The name of the source volume.

**Source Volume Serial**
The serial number of the source volume.

**Prefix**
The label that identifies snapshots created by this task.

**Retention Count**
The number of snapshots to retain with this prefix. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted.

**Last Created**
- The name of the last snapshot created by the task.
- Blank if the task has not taken a snapshot.

**Snapshot Name**
- The name of each snapshot taken.
- Blank if the task has not taken a snapshot.

**Snapshot Serial**
- The serial number of each snapshot taken.
- Blank if the task has not taken a snapshot.

**ResetSnapshot task, detail**

**Task Name**
The name of the task.

**Task Type**
TakeSnapshot

**ResetSnapshot**

**Status**
- Uninitialized: The task is not yet ready to run.
- Ready: The task is ready to run.
- Active: The task is running.
- Error: The task has an error.
• **Deleted**: The task is expired but this state is not yet synchronized to the partner controller.

**Task State**
The current step of the task:
- **Start**
- **VerifySnap**
- **UnmapSnap**
- **ResetSnap**

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

**Snapshot Name**
The name of the snapshot to reset.

**Snapshot Serial Number**
The serial number of the snapshot to reset.

**Replicate task, detail**
**Task Name**
The name of the task.

**Task Type**
Replicate

**Status**
- **Uninitialized**: The task is not yet ready to run.
- **Ready**: The task is ready to run.
- **Active**: The task is running.
- **Error**: The task has an error.
- **Deleted**: The task is expired but this state is not yet synchronized to the partner controller.

**Task State**
The current step of the task:
- **Idle**
- **Replicate**
- **VerifyRunning**

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

**EnableDSD task, detail**
**Task Name**
The name of the task.

**Task Type**
EnableDSD

**Status**
- **Uninitialized**: The task is not yet ready to run.
- **Ready**: The task is ready to run.
- **Active**: The task is running.
- **Error**: The task has an error.
- **Deleted**: The task is expired but this state is not yet synchronized to the partner controller.

**Task State**
The current step of the task, which is always Start.
Error Message
- If an error occurred while processing the task, the error message.
- Blank if no error has occurred.

**DisableDSD task, detail**

**Task Name**
The name of the task.

**Task Type**
DisableDSD

**Status**
- Uninitialized: The task is not yet ready to run.
- Ready: The task is ready to run.
- Active: The task is running.
- Error: The task has an error.
- Deleted: The task is expired but this state is not yet synchronized to the partner controller.

**Task State**
The current step of the task, which is always Start.

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

**Examples**
Show information about all tasks.
```
# show tasks
```
Show information about task Task1.
```
# show tasks Task1
```

**Basetypes**
tasks
status

**See also**
create schedule
create task
delete task
set schedule
set task
show schedules

---

**show tiers**

**Description**
Shows information about tiers.

**Minimum role**
monitor

**Syntax**
```
show tiers
tier performance|standard|archive|readcache|all
```

**Parameters**
tier performance|standard|archive|readcache|all
Specifies the tier for which to show information.

**Output**
```
Pool
The name of the pool.
Tier
```
The name of the tier.
% of Pool
The percentage of pool capacity that the tier occupies.
Disks
The number of disks in the tier.
Total Size
The total capacity of the tier.
Alloc Size
The amount of space currently allocated to volumes in the tier.
Available Size
The available capacity in the tier.
Affinity Size
The total size of volumes configured to have affinity for that tier.

Examples
Show information about all tiers.
# show tiers tier all
Show information about the Standard tier.
# show tiers tier standard

Basetypes
 tiers
  status
See also
  show tier-statistics

show tier-statistics

Description
Shows live performance statistics for tiers. The command will show information for all tiers by default, or you can use parameters to filter the output. For tier performance statistics, the system samples live data every 30 seconds.

Properties shown only in API format are described in API basetype properties

Minimum role
monitor

Syntax
show tier-statistics
  [pool pool]
  tier performance|standard|archive|readcache|all

Parameters
pool pool
Optional. Specifies the name or serial number of the pool for which to show information. If this parameter is omitted, information is shown for all pools.
tier performance|standard|archive|readcache|all
Specifies the tier for which to show statistics.

Output
Pool
The name of the pool.
Tier
The name of the tier.
Pages Allocated per Min
The rate, in pages per minute, at which pages are allocated to volumes in the tier because they need more space to store data.

Pages Allocated per Minute

The rate, in pages per minute, at which pages are deallocated from volumes in the tier because they no longer need the space to store data.

Pages Deallocated per Min

The number of 4 MB pages that have been automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).

Pages Reclaimed

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.

Pages Unmapped per Minute

The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.

Time Since Reset

The number of read operations since these statistics were last reset or since the controller was restarted.

Reads

The number of write operations since these statistics were last reset or since the controller was restarted.

Writes

The amount of data read since these statistics were last reset or since the controller was restarted.

Data Read

The amount of data written since these statistics were last reset or since the controller was restarted.

Data Written

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.

Bps

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.

IOPS

The average response time, in microseconds, for read and write operations since the last sampling time.

I/O Resp Time

The average response time, in microseconds, for read operations since the last sampling time.

Read Resp Time

The average response time, in microseconds, for write operations since the last sampling time.

Write Resp Time

Examples

Show statistics for all tiers.

# show tier-statistics tier all

Show statistics for the Standard tier in pool A.

# show tier-statistics pool A tier standard

Base types

tier-statistics
status

See also

reset all-statistics
show pools
show tiers
show unwritable-cache

Description
Shows the percentage of unwritable data in the system. This data has not been written to disk because it is associated with a volume that no longer exists or whose disks are not online. If the data is needed, the volume’s disks must be brought online. If the data is not needed it can be cleared, in which case it will be lost and data will differ between the host and disk.

**NOTE:** If you are uncertain whether to clear unwritable cache data, contact technical support for assistance.

Minimum role
monitor

Syntax
show unwritable-cache

Output
Percent of unwritable cache in controller ID
The percentage of cache space occupied by unwritable data in the indicated controller module.

Examples
Show the percentage of unwritable cache data in each controller.

```
# show unwritable-cache
```

Basetypes
unwritable-cache
status

See also
clear cache

diagnostic

show users

Description
Shows configured user accounts.

Minimum role
monitor

Syntax
show users
[show-snmp-password]
[user]

Parameters
show-snmp-password
Optional. Minimum role: manage. For SNMPv3 users, this parameter shows Password and Privacy Password values in clear text for reference when configuring users in the corresponding management application. If this parameter is omitted, password values are not displayed for security reasons.

user
Optional. Shows settings for the specified user only. If this parameter is omitted, settings are shown for all users.

Output
Username
The user name.

Roles
• monitor: The user can view but not change system settings.
• manage: The user can view and change system settings.
• diagnostic: The user can view and change system settings.

User Type
The experience level of the user: Novice, Standard, Advanced, or Diagnostic. This parameter does not affect access to commands.

User Locale
The display language.

WBI
• x: The user can access the web-browser interface (the MESM).
• (blank): The user cannot access this interface.

CLI
• x: The user can access the command-line interface.
• (blank): The user cannot access this interface.

FTP
• x: The user can access the FTP or SFTP interface.
• (blank): The user cannot access this interface.

SMI-S
• x: The user can access the Storage Management Initiative Specification (SMI-S) interface.
• (blank): The user cannot access this interface.

SNMP
• U: The user can access the SNMPv3 interface and view the MIB.
• (blank): The user cannot access this interface.
• T: The user can access the SNMPv3 interface and receive trap notifications.

Authentication Type
• MD5: MD5 authentication.
• SHA: SHA-1 authentication.
• none: No authentication.

Privacy Type
• DES: Data Encryption Standard.
• AES: Advanced Encryption Standard.
• none: No encryption.

Password
The user password. For a standard user the password is represented by eight asterisks. For an SNMPv3 user this is the authentication password.

Privacy Password
The encryption password for an SNMPv3 user whose privacy type is set to DES or AES.

Trap Host Address
SNMP trap destination for an SNMPv3 user that can receive trap notifications.

Examples
Show information about all users.
# show users
Show information about user JSmith.
# show users JSmith
As a user with the manage role, show information—including SNMP passwords—for SNMPv3 user Traps.
# show users Traps show-snmp-password

Base types
users
status

See also
create user
delete user
set user
**show vdisks**

**Description**
Shows information about all or specified linear disk groups. This command applies to linear storage only.

**Minimum role**
monitor

**Syntax**
```
show vdisks 
[vdisks]
```

**Parameters**
Optional. A comma-separated list of the names or serial numbers of the linear disk groups to show information about. A name that includes a space must be enclosed in double quotes.

**Output**
- **Name**: The name of the disk group.
- **Size**: The size of the disk group.
- **Free**: The amount of free (available) space in the disk group.
- **Own**: Either the preferred owner during normal operation or the partner controller when the preferred owner is offline.
- **Pref**: The controller that owns the disk group and its volumes during normal operation.
- **RAID**: The disk-group RAID level.
- **Class**
  - Linear: The disk group acts as a linear pool.
  - Virtual: The disk group is in a virtual pool.
- **Disks**: The number of disks in the disk group.
- **Spr**: The number of spares assigned to the disk group.
- **Chk**
  - For RAID levels except NRAID, RAID 1, and RAID 50, the configured chunk size for the disk group.
  - For NRAID and RAID 1, chunk-size has no meaning and is therefore shown as not applicable (N/A).
  - For RAID 50, the disk-group chunk size calculated as: `configured-chunk-size x (subgroup-members - 1)`. For a disk group configured to use 64-KB chunk size and 4-disk subgroups, the value would be 192k (64KB x 3).
- **Status**
  - CRIT: Critical. The disk group is online but isn’t fault tolerant because some of its disks are down.
  - DMGD: Damaged. The disk group is online and fault tolerant, but some of its disks are damaged.
  - FTDN: Fault tolerant with a down disk. The vdisk is online and fault tolerant, but some of its disks are down.
  - FTOL: Fault tolerant and online.
  - MSNG: Missing. The disk group is online and fault tolerant, but some of its disks are missing.
  - OFFL: Offline. Either the disk group is using offline initialization, or its disks are down and data may be lost.
  - QTCR: Quarantined critical. The vdisk is critical with at least one inaccessible disk. For example, two disks are inaccessible in a RAID-6 disk group or one disk is inaccessible for other fault-tolerant RAID levels. If
the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined.
- **QTDN**: Quarantined with a down disk. The RAID-6 disk group has one inaccessible disk. The disk group is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined.
- **QTOF**: Quarantined offline. The disk group is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 disk group.
- **STOP**: The disk group is stopped.
- **UNKN**: Unknown.
- **UP**: Up. The disk group is online and does not have fault-tolerant attributes.

**Jobs**

Shows whether a job is running and its percent complete.
- **DRSC**: A disk is being scrubbed.
- **EXPD**: The disk group is being expanded.
- **INIT**: The disk group is initializing.
- **RBAL**: The ADAPT disk group is being rebalanced.
- **RCON**: At least one disk in the vdisk is being reconstructed.
- **VDRAIN**: The virtual disk group is being removed and its data is being drained to another disk group.
- **VPREP**: The virtual disk group is being prepared for use in a virtual pool.
- **VRECV**: The virtual disk group is being recovered to restore its membership in the virtual pool.
- **VREMV**: The disk group and its data are being removed.
- **VRFY**: The disk group is being verified.
- **VRSC**: The disk group is being scrubbed.
- Blank if no job is running.

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

**Serial Number**

The serial number of the disk group.

**Spin Down**
- **Disabled**: DSD is disabled for the disk group.
- **Enabled**: DSD is enabled for the disk group.
- **Partial spin-down**: DSD is enabled for the disk group and its disks are partially spun down to conserve power.
- **Full spin-down**: DSD is enabled for the disk group and its disks are fully spun down to conserve power.

**SD Delay**

For spinning disks in non-ADAPT disk groups, the period of inactivity after which the disk group’s disks and dedicated spares will automatically spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.

**Sec Fmt**

The sector format of disks in the disk group.
- **512n**: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes.
- **512e**: All disks use 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Eight logical blocks will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.
- **Mixed**: The disk group contains a mix of 512n and 512e disks. This is supported, but for consistent and predictable performance, do not mix disks of different rotational speed or sector size types (512n, 512e).

**Health**
- **OK**
- **Degraded**
• Fault
• N/A
• Unknown

Reason
If Health is not OK, this field shows the reason for the health state.

Action
If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Examples
Show information about all linear disk groups.

```
# show vdisks
```

Show information about linear disk group vd0002.

```
# show vdisks vd0002
```

Base types
virtual-disks
status

See also
create vdisk
delete vdisks
expand vdisk
set vdisk

---

**show vdisk-statistics**

**Description**
Shows live or historical performance statistics for linear disk groups. This command applies to linear storage only.

You can view live statistics for all or specified disk groups, or historical statistics for a specified disk group. For disk-group performance statistics, the system samples live data every 30 seconds and historical data every quarter hour, and retains historical data for 6 months.

The historical option allows you to specify a time range or a number (count) of data samples to include. It is not recommended to specify both the time-range and count parameters. If both parameters are specified, and more samples exist for the specified time range, the samples’ values will be aggregated to show the required number of samples.

For each disk group these statistics quantify destages, read-aheads, and host reads that are cache misses. For example, each time data is written from a volume’s cache to disks in the disk group that contains the volume, the disk group’s statistics are adjusted.

Properties shown only in API format are described in API basetype properties.

**NOTE:**
- Values for the amount of data transferred and for data throughput appear to be much higher in historical output than in live output. This is caused by a difference in the way that historical and live values are calculated.
- Live values are calculated based on the vdisk as viewed from the controller cache perspective. In the live statistics, performance numbers are obtained by accounting for when data is written from cache to disk or is read from disk to cache.
- Historical data is obtained by using the summation of the disk statistics for the disks in the vdisk. The historical vdisk data shows transfers to and from the disks in the vdisk that include the overhead of any RAID transfers as well as any host activity.
- Because I/Os from the RAID engine are included, values for the historical data appear higher than the numbers for the live data.

Minimum role
monitor
Syntax

To show live statistics:
show vdisk-statistics
[vdisks]

To show historical statistics:
show vdisk-statistics
[all]
[count number-of-data-samples]
historical
[time-range "date/time-range"]
vdisk

Parameters

all
Optional. Specifies to show the full set of performance metrics. If this parameter is omitted, the default set of performance metrics will be shown.

count number-of-data-samples
Optional. Specifies the number of data samples to display, from 1 to 100. Each sample will be shown as a separate row in the command output. If this parameter is omitted, 100 samples will be shown. If you specify this parameter, do not specify the time-range parameter.

historical
Optional. Specifies to show historical statistics. If this parameter is omitted, live statistics will be shown.

[time-range "date/time-range"]
Optional. Specifies the date/time range of historical statistics to show, in the format "start yyyy-mm-dd hh : mm[AM| PM] end yyyy-mm-dd hh : mm[AM| PM]". If the start date/time is specified but no end date/time is specified, the current date/time will be used as the end date/time. The system will return the oldest sample taken after the start time and the latest sample taken before the end time. If the specified start date/time is earlier than the oldest sample, that sample will be used as the start date/time. If you specify this parameter, do not specify the count parameter. If this parameter is omitted, the most recent 100 data samples will be displayed.

vdisk
Specifies the name or serial number of one disk group for which to show historical statistics. A name that includes a space must be enclosed in double quotes.

disks
Optional. Specifies a comma-separated list of the names or serial number of disk groups for which to show live statistics. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, statistics will be shown for all disk groups.

Output

Live
Name
The name of the disk group.
Serial Number
The serial number of the disk group.
Bps
The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
IOPS
The input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
Reads
The number of read operations since these statistics were last reset or since the controller was restarted.
Writes
The number of write operations since these statistics were last reset or since the controller was restarted.

Data Read
Amount of data read since these statistics were last reset or since the controller was restarted.

Data Written
The amount of data written since these statistics were last reset or since the controller was restarted.

I/O Resp Time
The average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.

Read Resp Time
The average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.

Write Resp Time
The average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.

Reset Time
The date and time, in the format yyyy-mm-dd hh:mm:seconds, when these statistics were last reset, either by a user or by a controller restart.

Historical
Name
The name of the disk group.

Serial Number
The serial number of the disk group.

Data Transferred
The total amount of data read and written since the last sampling time.

Total B/s
The data transfer rate, in bytes per second, for read and write operations since the last sampling time.

Sample Time
The date and time, in the format yyyy-mm-dd hh:mm:seconds, when the data sample was taken.

Historical, all
Name
The name of the disk group.

Serial Number
The serial number of the disk group.

Data Transferred
The total amount of data read and written since the last sampling time.

Data Read
Shown by the all parameter. The amount of data read since the last sampling time.

Data Written
Shown by the all parameter. The amount of data written since the last sampling time.

Total B/s
The data transfer rate, in bytes per second, since the last sampling time. This is the sum of Read B/s and Write B/s.

Read B/s
Shown by the all parameter. The data transfer rate, in bytes per second, for read operations since the last sampling time.

Write B/s

Shown by the all parameter. The data transfer rate, in bytes per second, for write operations since the last sampling time.

Sample Time

The date and time, in the format yyyy-mm-dd hh:mm:seconds, when the data sample was taken.

Examples

Show live statistics for linear disk groups VD1 and MyVdisk.

# show vdisk-statistics VD1,MyVdisk

Show historical statistics from a specified date and time range for linear disk group VD2.

# show vdisk-statistics VD2 historical time-range "start 2013-01-18 4:40 PM end 2013-01-18 5:00 PM"

Show all historical statistics (the latest 100 samples) for linear disk group VD2.

# show vdisk-statistics VD2 historical all

Basetypes

vdisk-statistics (live)
virtual-disk-summary (historical)
vdisk-hist-statistics (historical)
status

See also

reset all-statistics
reset vdisk-statistics
show vdisks

show versions

Description

Shows firmware and hardware version information for the system.

Minimum role

monitor

Syntax

show versions
[detail]
[frus]

Parameters

detail

Optional. Shows information about the versions of firmware and hardware in each controller module. If this parameter is omitted, only firmware-bundle information is shown.

frus

Optional. Shows information about firmware versions for FRUs in each enclosure. If this parameter is omitted, only controller-module information is shown.

Examples

Show firmware-bundle version information for the system.

# show versions

Show detailed version information for each controller module.

# show versions detail

Show version information for FRUs in each enclosure.

# show versions frus

Basetypes

versions
expander-versions
fru-versions
status

See also
show inquiry

show volume-copies

Description
Shows information about in-progress copy volume operations.

Minimum role
monitor

Syntax
show volume-copies

Parameters
Src Volume
The name of the source volume.

Src Type
The type of the source volume: Virtual or Linear.

Src Pool
The name of the source pool: A or B.

Dest Volume
The name of the destination volume.

Dest Type
The type of the destination volume.

Dest Pool
The name of the destination pool: A or B.

Progress
The percent complete of the operation.

Examples
Show information about in-progress copy volume operations.

# show volume-copies

Base types
copy-volumes
status

See also
abort copy
copy volume

show volume-groups

Description
Shows information about specified volume groups or all volume groups.

Minimum role
monitor

Syntax
show volume-groups
[volume-groups]

Output
Volume group information:
Group Name
The name of the volume group.
Serial Number
The serial number of the volume group.

Type
The group type, which is Volume.

Number of Members
The number of volumes in the volume group.

Volume information:

Pool
The name of the pool that contains the volume.

Name
The name of the volume.

Total Size
The total size of the volume.

Alloc Size
The amount of space currently allocated to a virtual volume, or the total size of a linear volume.

Class
- Virtual: The volume is in a virtual pool.

Type
- base: Base volume
- standard: Standard volume

Health
- OK
- Degraded
- Fault
- N/A
- Unknown

Reason
If Health is not OK, this field shows the reason for the health state.

Action
If Health is not OK, this field shows recommended actions to take to resolve the health issue.

Examples
Show information about all volume groups.

# show volume-groups

Show information about volume groups VGroup1 and VGroup2.

# show volume-groups VGroup1,VGroup2

Base types

volume-groups
volumes
status

See also

create volume-group
delete volume-groups
set volume-group

describe volume-names

Description
Shows volume names and serial numbers.
Minimum role: monitor

Syntax

show volume-names
[volumes]

Parameters

volumes
Optional. A comma-separated list of the names or serial numbers of the volumes for which to show information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all volumes.

Output

Name
The name of the volume.
Serial Number
The serial number of the volume.

Examples

Show volume names and serial numbers.
# show volume-names

Base types
volume-names
status

See also
show maps
show volumes

show volume-reservations

Description
Shows persistent reservations for all or specified volumes. The persistent group reservations (PGR) mechanism enables application clients on multiple hosts to control access to a storage volume, and limits access by other hosts.

Each host must be registered with the storage system in order to establish a persistent reservation for a volume, thereby becoming a reservation holder.

If the system gets into an abnormal state and you need to remove all registrations and reservations for specified volumes to return them to a “clean” state, you can use the release volume command. This command must be used with care, as described in its help.

For more information about persistent reservations, see the SPC-3 specification at http://www.t10.org/.

Minimum role: monitor

Syntax

show volume-reservations
[all|volumes]

Output

Properties are described in alphabetical order.

Host ID
For an FC initiator, its WWPN. For a SAS initiator, its WWPN. For an iSCSI initiator, its node name (typically the IQN).

Key
The reservation key, shown as a hexadecimal value.

Name
The name of the volume.

PGR Generation
The generation of the volume reservation, shown as a hexadecimal value.

Ports
The controller host-port identifiers.

**Reservation Type**
- **Write Exclusive**: Write commands are only allowed for a single reservation holder.
- **Exclusive Access**: Certain access (read, write) commands are only allowed for a single reservation holder.
- **Write Exclusive - Registrants Only**: Write commands are only allowed for registered hosts. There is a single reservation holder.
- **Exclusive Access - Registrants Only**: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder.
- **Write Exclusive - All Registrants**: Write commands are only allowed for registered hosts. There is a single reservation holder.
- **Exclusive Access - All Registrants**: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder.
- **Undefined**: The volume has no persistent reservations.

**Scope**
The reservation scope, Logical Unit.

**Serial Number**
The serial number of the volume.

**Volume Reserved**
- **Free**: The volume is not reserved.
- **Reserved**: The volume has been reserved by a host.

**Examples**
Show reservations for all volumes.
```
# show volume-reservations
```
Show reservations for volume v1.
```
# show volume-reservations v1
```

**Base types**

- volume-reservations
- status

**See also**
release volume
show volumes

**show volume-statistics**

**Description**
Shows live performance statistics for all or specified volumes. For each volume these statistics quantify I/O operations between hosts and the volume. For example, each time a host writes to a volume’s cache, the volume’s statistics are adjusted. For volume performance statistics, the system samples live data every 15 seconds.

Statistics shown only in API output are described in API basetype properties.

**Minimum role**
monitor

**Syntax**
```
show volume-statistics [volumes]
```

**Parameters**
- **volumes**: Optional. A comma-separated list of the names or serial numbers of the volumes for which to show information. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, information is shown for all volumes.

**Output**
Name
The name of the volume.

Serial Number

The serial number of the volume.

Bps

The data transfer rate, in bytes per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

IOPS

The input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.

Reads

The number of read operations since these statistics were last reset or since the controller was restarted.

Writes

The number of write operations since these statistics were last reset or since the controller was restarted.

Data Read

The amount of data read since these statistics were last reset or since the controller was restarted.

Data Written

The amount of data written since these statistics were last reset or since the controller was restarted.

Allocated Pages

The number of pages allocated to the volume.

% Performance

The percentage of volume capacity occupied by data in the Performance tier.

% Standard

The percentage of volume capacity occupied by data in the Standard tier.

% Archive

The percentage of volume capacity occupied by data in the Archive tier.

% RC

The percentage of read-cache capacity that is occupied.

Reset Time

The date and time, in the format year-month-day-hour:minutes:seconds, when these statistics were last reset, either by a user or by a controller restart.

Examples

Show live performance statistics for all volumes.

# show volume-statistics

Show live performance statistics for volume v0001.

# show volume-statistics v0001

Base types

toollens

status

See also

reset all-statistics
reset volume-statistics
show volumes
**show volumes**

**Description**  
Shows information about volumes. The command will show information for all volumes by default, or you can use parameters to filter the output.

**Minimum role**  
monitor

**Syntax**
```
show volumes
[details]
[pool pool]
[type all|base|standard|snapshot|primary-volume|secondary-volume]
[vdisk vdisks]
[volumes]
```

**Parameters**

* details  
  Optional. Shows additional information about the volumes.

* pattern string
  Optional. Shows volumes whose names contain the specified string. The string can include the following wildcards, singly or in combination.
  - *: Matches zero or more characters.
  - ?: Matches any one character. Use multiple '?' wildcards to find names of a specific length. For example, Vol?? will find names starting with Vol that are five characters long.
  - []: Matches any character within the brackets, except a hyphen. Alphabetic characters are case sensitive. For example, [123] matches 1, 2, or 3. Use a hyphen between two characters to specify a range. For example, [0-9] matches any one digit. You can combine the list and range forms. For example, [xy1-3] matches x or y (but not X or Y), or 1, 2, or 3.

* pool pool
  Optional. The name or serial number of the pool that contains the volumes for which to show information.

* type all|base|standard|snapshot|primary-volume|secondary-volume
  Optional.
  - all: Show all volumes.
  - base: Show only virtual volumes that are not snapshots of any other volume.
  - snapshot: Show only snapshots.
  - standard: Show only standard volumes.
  - primary-volume: Show only primary volumes.
  - secondary-volume: Show only secondary volumes.

If this parameter is omitted, all volumes are shown.

* vdisk vdisks
  Optional. A comma-separated list of the names or serial numbers of the vdisks containing the volumes to show. A name that includes a space must be enclosed in double quotes.

* volumes
  Optional. A comma-separated list of the names or serial numbers of volumes for which to show information. A name that includes a space must be enclosed in double quotes.

**Output**

Properties are described in alphabetical order.

* Action
  If Health is not OK, this field shows recommended actions to take to resolve the health issue.

* Alloc Size
The amount of space currently allocated to a virtual volume, or the total size of a linear volume.

Cache Opt

Shown by the details parameter. The cache optimization mode:

- **standard**: This controller cache mode of operation is optimized for sequential and random I/O and is the optimization of choice for most workloads. In this mode, the cache is kept coherent with the partner controller.
- **no-mirror**: In this mode of operation, the controller cache performs the same as the standard mode with the exception that the cache metadata is not mirrored to the partner. While this improves the response time of write I/O, it comes at the cost of redundancy. If this option is used, the user can expect higher write performance but is exposed to data loss if a controller fails.

Class

- **Linear**: The volume is in a linear pool.
- **Virtual**: The volume is in a virtual pool.

Desc

Shown by the details parameter. Blank if not set.

Health

- **OK**
- **Degraded**
- **Fault**
- **N/A**
- **Unknown**

Large Virtual Extents

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

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

Name

The name of the volume.

Pool

The name of the pool that contains the volume.

Read Ahead

Shown by the details parameter. The read-ahead cache setting:

- **Disabled**: Read-ahead is disabled.
- **Adaptive**: Adaptive read-ahead is enabled, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload.
- **Stripe**: Read-ahead is set to one stripe. The controllers treat NRAID and RAID-1 disk groups internally as if they have a stripe size of 512 KB, even though they are not striped.
- **512 KB, 1 MB, 2 MB, 4 MB, 8 MB, 16 MB, or 32 MB**: Size selected by a user.

Reason

If Health is not **OK**, this field shows the reason for the health state.

Role

Shown by the details parameter.

- **Copy Source**: The volume is the source for a volume copy operation.
- **Copy Destination**: The volume is the destination for a volume copy operation.
- **Primary**: The volume is the primary volume in a replication set.
- **Secondary**: The volume is the secondary volume in a replication set.
- **(blank)**: Not applicable.

Serial Number
Shown by the details parameter. The serial number of the volume.

Size
The total size of the volume.

Snap-Pool
Shown by the details parameter. Not applicable.

Snap Retention Priority
Shown by the details parameter. The retention priority for snapshots of the volume.
- never-delete: Snapshots will never be deleted.
- high: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted.
- medium: Snapshots may be deleted after all eligible low-priority snapshots have been deleted.
- low: Snapshots may be deleted.

Snapshots that are mapped or are not leaves of a volume's snapshot tree are not eligible for automatic deletion.

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

Total Size
The total size of the volume.

Type
- base: Base volume
- standard: Standard volume

Vdisk
The name of the vdisk that contains the volume.

WR Policy
Shown by the details parameter. The cache write policy:
- write-back: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput.
- write-through: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance.

WWN
Shown by the details parameter. The World Wide Name of the volume

**Examples**

Show about all volumes.
```
# show volumes
```
Show detailed information for volume volA.
```
# show volumes details volA
```
Show volumes whose names start with Vol followed by any single character, an underscore, and a two-digit number — such as VolA_01 or Vol3_10, but not volA_01 or Vol3_1.
```
# show volumes pattern Vol?_[0-9][0-9]
```

262  Alphabetical list of commands
shutdown

**Description**

Shuts down the Storage Controller in a controller module. This ensures that a proper failover sequence is used, which includes stopping all I/O operations and writing any data in write cache to disk.

⚠️ **CAUTION:** Performing a shut down will cause data to be unavailable from the Storage Controller that is shut down. If the Storage Controller in each controller module is shut down, hosts cannot access the system’s data.

**Minimum role**

manage

**Syntax**

Shutdown

\[
[a|b|both]
\]

**Parameters**

a|b|both

Optional. Specifies to shut down the Storage Controller in controller A, B, or both. If this parameter is omitted, the command affects the controller being accessed.

**Examples**

Shut down the Storage Controller in controller A.

# shutdown a

**See also**

restart mc
restart sc
show shutdown-status

suspend replication-set

**Description**

Suspends the replication operations for the specified replication set. This command applies to virtual storage only. You can run this command on the replication set’s primary system.

When you run this command, all replications in progress are paused and no new replications are allowed to start. During the suspension period, you can abort paused replications using the `abort replication` command. After you suspend replication, you must resume it using the `resume replication-set` command to allow the replication set to resume replications that were in progress and allow new replications to start.

If replications are attempted during the suspended period (including scheduled replications), the replications will fail.

**Minimum role**

manage

**Syntax**

suspend replication-set

replication-set-ID

Alphabetical list of commands 263
Parameters

replication-set-ID

The name or serial number of the replication set for which to suspend replication.

Examples

Suspend replications in replication set RS1.

# suspend replication-set RS1

See also

abort replication
create replication-set
delete replication-set
resume replication-set
set replication-set
show replication-sets

test

Description

Sends a test message to configured destinations for event notification and managed logs. After issuing this command, verify that the test message reached its destinations.

Minimum role

manage

Syntax

test

e-mail|managedlogs|managedlogswarn|managedlogswrap|notification|snmp [region crash1|crash2|crash3|crash4|ecdebug|mc|scdebug]

Output

e-mail|managedlogs|managedlogswarn|managedlogswrap|notification|snmp

• e-mail: This option behaves the same as the notification option and remains for backward compatibility only.

• managedlogs: Specify this option to test receipt of the managed-logs notification that logs need to be transferred. (Event 400)

• managedlogswarn: Specify this option to test receipt of the managed-logs notification that logs are nearly full and must be transferred to avoid losing older entries. (Event 401)

• managedlogswrap: Specify this option to test receipt of the managed-logs notification that logs have wrapped and older entries may be lost. (Event 402)

• notification: Specify this option to test receipt of event-notification messages by every interface that is configured to receive them, such as email, SNMP, and SMI-S. (Event 312)

• snmp: This option behaves the same as the notification option.

region crash1|crash2|crash3|crash4|ecdebug|mc|scdebug

Optional. For use with the managed logs feature, this parameter specifies the log type (debug-data region) for which to send notifications.

• crash1, crash2, crash3, or crash4: Specify one of these options to send notification for one of the Storage Controller’s four crash logs.

• ecdebug: Specify this option to send notification for the Expander Controller log.

• mc: Specify this option to send notification for the Management Controller log.

• scdebug: Specify this option to send notification for the Storage Controller log, which includes the event log.

If this parameter is omitted, the command sends four representative log types: crash1, ecdebug, scdebug, and mc.

Examples

Test receipt of event notifications by every interface that is configured to receive them.

# test notification

Test receipt of the managed-logs notification that the Storage Controller log needs to be transferred.

# test managedlogs region scdebug
trust

Description

Enables an offline disk group to be brought online for emergency data recovery.

⚠️ **CAUTION:** Improper use of trust may cause data corruption or data loss.

⚠️ **NOTE:** This command is for use by or with direction from technical support.

This command must be enabled before each use. If used improperly this command can cause unstable operation and data loss. Before use, carefully read the cautions and procedures below.

The trust command provides an opportunity to recover data from a disk group that has failed due to disk failure. The command forces a resynchronization of the metadata (as well as time and date stamps) that unifies members of a disk group, and essentially puts the disk group back into an accessible state. As long as the failed disks are operable, data can be read from the disks and restored to another location.

From examining the state of the disks, if the command determines that the trust operation is unsafe—that it may result in an unstable disk group with data corruption—the command will fail. You may then seek assistance from technical support or run the command with a special parameter to acknowledge the risk of proceeding. Otherwise, if the command determines the operation to be safe, the command will proceed.

When the “trusted” disk group is back online, back up its data and audit the data to make sure that it is intact. Then delete that disk group, create a new disk group, and restore data from the backup to the new disk group. Using a trusted disk group is only a disaster-recovery measure. The disk group has no tolerance for any additional failures.

The following procedure outlines the general steps for performing a trust operation, but the best procedure to follow for your situation may vary from this procedure. Before starting this procedure, contact technical support for assistance in determining if the trust operation applies to your situation, and for assistance to perform it.

⚠️ **CAUTION:**

1. Do not use the trust command when the storage system is unstable. For example, if there are many power or topology-change events.

2. The trust command can be run on a quarantined-offline or offline disk group. In many cases the disk group will be automatically dequarantined. If you cannot resolve the issue that caused the disk to become quarantined such that it is automatically dequarantined, and if the trust operation is applicable to your situation, then proceed to trust.

   ⚠️ **NOTE:** The best practice is to dequarantine the disk group and then proceed to trust the offline disk group. If the dequarantine command fails then contact technical support for assistance.

   ⚠️ **CAUTION:** Performing trust on a quarantined-offline disk group can cause data corruption because it will bring a disk with stale data back into the disk group.

3. Never update controller-module, expansion-module, or disk firmware when the disk group is offline.

4. Never clear unwritten data cache when a disk group is offline.

5. Do not use the trust command on a disk group that failed during disk-group expansion.

6. Do not use the trust command on a disk group with status CRIT. Instead, add spares and let the system reconstruct the disk group.

The trust command must be used in CLI console mode. Steps for running the trust command:

1. Disable background scrub of disks and disk group to avoid running scrubs automatically.

2. Identify the cause for the disk group becoming offline.

3. If an external issue (power, cabling, and so forth) caused the disk group to fail, fix the external issue before continuing to the next step.

4. Disable host access to the failed disk group. In a single-controller configuration, disconnect the host-port cables. In a dual-controller configuration:
a. Determine the owning controller of the failed disk group.

b. As a precautionary measure, remove the host-port cables of the owning controller of the offline disk group.

5. Unseat the spare disks associated with the disk group to prevent reconstruction.

⚠️ CAUTION: It is recommended to avoid reconstruction after using the trust command. Reconstruction causes heavy usage of disks that were already reporting errors. This usage could cause the disks to fail during reconstruction, which can cause data to be unrecoverable.

6. Enable the trust command.

7. Run the trust command on the disk group.

8. If the trust command determines that it would be unsafe to proceed, it will fail. If this happens you can either:

- Contact Support for further assistance. This is recommended.
- Proceed by re-enabling trust and running trust with the unsafe parameter. This is not recommended because in most cases it will result in an unstable disk group with data corruption.

After running the trust command

1. Reinsert the host-port cables.

2. Perform a complete backup of the disk group.

3. Delete the disk group.

4. Replace the failed disks with new disks.

5. Re-create the disk group.

6. Restore the data from the backup performed in step 2.

7. Restore original disk-group ownership.

8. Re-enable background scrub operations.

### Minimum role

*manage*

### Syntax

```
Trust
[enable|disable]
[disk-group disk-group]
[unsafe]
[vdisk vdisk]
```

### Parameters

- `enable|disable` Optional. `enable`: Enables the trust command before use. `disable`: Disables the trust command if it is not used after being enabled. If trust is not explicitly disabled, it will be automatically disabled when the user’s CLI session ends.

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

- `unsafe` Optional. Specifies to proceed with a trust operation that is determined to be unsafe because it must use out-of-sync or partially reconstructed disks.

⚠️ CAUTION: In most cases using this option will result in an unstable disk group with data corruption.

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

### Output

With the unsafe parameter:
The enclosure ID and slot number of the disk.

Serial Number
The serial number of the disk.

Type
- SAS: Enterprise SAS spinning disk.
- SAS MDL: Midline SAS spinning disk.
- sSAS: Dual-port, SAS solid-state disk (SSD).

State
- AVAIL: Available
- 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: Global spare
- LEFTOVR: Leftover
- VDISK: Used in a disk group
- VDISK SP: Spare assigned to a disk group

Partially Recon Target
- True: The disk contains partially reconstructed data.
- False: The disk does not contain partially reconstructed data.

Out Of Sync
- True: The disk data is out of sync with other disks in the disk group.
- False: The disk data is in sync with other disks in the disk group.

Age
The age of the disk in the disk group. The age value starts at 1 and is incremented for all good disks in the disk group each time there is a change in the disk configuration of the disk group, such as when a disk is detected to have failed or be missing. Therefore, if a disk has a lower age than other disks in the disk group, that disk is out-of-sync with the other disk group members. This value can be used as a guide to decide which disks to physically remove before doing the trust operation to minimize the amount of corrupt data in the trusted disk group if you want to use the unsafe parameter.

Examples
Trust a disk group which has enough good disks to complete the trust operation. The disk group may have out-of-sync or partially reconstructed disks but they are not needed to complete the trust operation. The command completes successfully.

```
# trust enable
Success: Command completed successfully. - Trust is enabled. (2013-09-17 04:29:28)
# trust disk-group data_1
Success: Command completed successfully. (data_1) - Trust operation completed successfully for this disk group. (2013-09-17 04:29:35)
```

Trust a disk group which does not have enough good disks available to complete the trust operation. The command fails.

```
# trust enable
Success: Command completed successfully. - Trust is enabled. (2013-09-17 04:12:49)
# trust disk-group data_1
Error: The trust operation failed because the disk group has an insufficient number of in-sync disks. - Please contact Support for further assistance. (2013-09-17 04:13:13)
```

Trust a disk group which has out-of-sync or partially reconstructed disks that would be needed to complete the trust operation. The command fails.

```
# trust enable
Success: Command completed successfully. - Trust is enabled. (2013-09-17 09:06:41)
```
# trust disk-group data_1
Error: Command failed. - The disk group specified contains out-of-sync or partially reconstructed disks that are necessary to restore the disk group to an accessible state. Continuing with the trust operation may lead to data corruption. Please contact Support for further assistance. (2013-09-08 09:06:46)

Continuing the previous example, you decide to re-enable trust and proceed by specifying the unsafe parameter.

# trust enable
Success: Command completed successfully. - Trust is enabled. (2013-09-17 09:06:48)
# trust disk-group data_1 unsafe

Location Serial Number  Type State Partially Reconstructed Out Of Sync Age
--------------------------------------------------
---
1.2  SN SAS LEFTOVR False True 6
1.4  SN SAS VIRTUAL POOL False False 7
1.5  SN SAS LEFTOVR True False 4
--------------------------------------------------
---
WARNING: Found partially reconstructed and out-of-sync disk(s). Using these disks for trust will in most cases cause data corruption. Because of the risk of data corruption, it is recommended that you continue the trust operation only with the supervision of Support personnel. If you are ready to continue, enter "continue" at the prompt or enter "abort" to abort the operation and leave the disk group offline.
> continue
If you continue with the trust operation, you risk corrupting data in this disk group. Enter "accept" at the prompt if you intend to accept this risk and proceed with the trust operation or enter "abort" to abort the operation and leave the disk group offline.
> accept
Success: Command completed successfully. (data_1) - Trust operation completed successfully for this disk group. (2013-09-17 09:07:31)

Abort an unsafe trust operation when you decide not to risk using bad disks.

# trust enable
Success: Command completed successfully. - Trust is enabled. (2013-09-17 09:05:37)
Location Serial Number  Type State Partially Reconstructed Out Of Sync Age
1.2  SN SAS LEFTOVR False True 6
1.4  SN SAS VIRTUAL POOL False False 7
1.5  SN SAS LEFTOVR True False 4
---
WARNING: Found partially reconstructed and out-of-sync disk(s). Using these disks for trust will in most cases cause data corruption. Because of the risk of data corruption, it is recommended that you continue the trust operation only with the supervision of Support personnel. If you are ready to continue, enter "continue" at the prompt or enter "abort" to abort the operation and leave the disk group offline.
> continue
If you continue with the trust operation, you risk corrupting data in this disk group. Enter "accept" at the prompt if you intend to accept this risk and proceed with the trust operation or enter "abort" to abort the operation and leave the disk group offline.
> abort
Error: Command was aborted by user. (2013-09-17 09:05:49)

After enabling trust, disable it if you decide not to run trust disk-group.

# trust disable
Success: Command completed successfully. - Trust is disabled. (2013-09-17 17:40:01)

See also
- show disk-groups
- show vdisks
unfail controller

Description
Allows the partner controller module to recover from a simulated failure performed with the fail command (which requires the manage role). If you attempt to unfail a controller that is operating, the command will have no effect.

Minimum role
manage

Syntax
unfail controller

Examples
From controller A, unfail the partner controller.
# unfail controller

See also
fail
show controllers

unmap volume

Description
Deletes explicit mappings or the default mapping for specified volumes. When an explicit mapping between an initiator and a volume is deleted, access by that initiator to the volume is controlled by the volume’s default mapping (described in help for create volume). When a default mapping is deleted, access by initiators to the volume is controlled by any explicit mappings of those initiators to the volume. If neither mapping exists, the volume is unavailable to initiators.

If you want to mask access for a specific initiator to a specific volume, use the map volume command and set the access parameter to no-access.

⚠️ CAUTION: When a volume is unmapped from an initiator, the initiator will no longer be able to access the volume’s data.

Minimum role
manage

Syntax
To delete explicit mappings:
unmap volume
[host hosts]
initiator initiators|hosts|host-groups
volumes|volume-groups

To delete the default mapping:
unmap volume
volumes|volume-groups

Parameters
host hosts
Deprecated—use the initiator parameter instead.
initiator initiators|hosts|host-groups

A comma-separated list of initiators, hosts, or host groups for which to delete explicit mappings. For initiator, host, and host-group syntax, see Command syntax
volumes|volume-groups

A comma-separated list of volumes or volume groups to unmap. For a volume, specify its name or serial number. For a volume group, specify the name as volume-group.*. A name that includes a space must be enclosed in double quotes.
Examples

Delete explicit mappings for Host1 to volumes vol1 and vol3 (leaving the default mappings, if any, unchanged).

```
# unmap volume initiator Host1.* vol1,vol3
```

Delete volume vol2’s default mapping (leaving explicit mappings, if any, unchanged).

```
# unmap volume vol2
```

Delete explicit mappings for initiator FC-port1 to volume group MyVolumes (leaving the default mappings, if any, unchanged).

```
# unmap volume initiator FC-port1 MyVolumes.*.*
```

See also

map volume
show initiators
show maps
show volumes

verify disk-groups

Description

Analyzes redundant disk groups to find and fix inconsistencies between their redundancy data and their user data.

This command acts on all disks in a disk group but not dedicated spares or leftover disks. This command will find and optionally fix parity mismatches for RAID 3, 5, 6, and 50, and find mirror mismatches for RAID 1 and 10. This command can be performed only on a disk group whose status is FTOL (fault tolerant and online). This command cannot be performed for NRAID or RAID 0.

Verification can last over an hour, depending on disk-group size, utility priority, and amount of I/O activity. You can use a disk group while it is being verified. To view the progress of a verify (VRFY) job, use the show disk-groups command.

When verification is complete, event 21 is logged and specifies the number of inconsistencies found. Such inconsistencies can indicate that a disk is going bad.

**NOTE:** scrub disk-groups command operates similarly to verify disk-groups and can find media errors for any RAID level, including NRAID and RAID 0.

Minimum role

manage

Syntax

```
verify disk-groups [fix yes|no] disk-groups
```

Parameters

fix yes|no

Optional. Specifies whether or not to automatically fix parity mismatches by making parity match the data in all cases. The default is no. This parameter does not pertain to mirror mismatches, which are never automatically fixed because the system does not know which disk contains the "good" data.

disk-groups

A comma-separated list of the names or serial numbers of the disk groups to verify. A name that includes a space must be enclosed in double quotes.

Examples

Start verifying disk group dgl.

```
# verify disk-group dgl
```

See also

abort verify
scrub disk-groups
show disk-groups
**verify links**

**Description**
Verifies FC or iSCSI host-port link paths between controller A and controller B. This command is not applicable to a system with SAS controller modules.

**Minimum role**
manage

**Syntax**

```
verify link
[link-type FC|iSCSI|ALL]
```

**Parameters**

- `link-type FC|iSCSI|ALL`
- Optional. Specifies the type of host-port links to verify:
  - `FC`: Verify FC-to-FC links only.
  - `iSCSI`: Verify iSCSI-to-iSCSI links only.
  - `ALL`: Verify all FC-to-FC and iSCSI-to-iSCSI links.
- If this parameter is omitted, all links are verified.

**Output**

- `Port`
  - The port ID.
- `Type`
  - `FC`: FC port.
  - `iSCSI`: iSCSI port.
  - `Unknown`: Port type is unknown.
- `Links`
  - The IDs of linked ports.

**Examples**

Verify all links between controllers A and B.

```
# verify links
```

**verify vdisk**

**Description**
Analyzes redundant vdisks to find and fix inconsistencies between their redundancy data and their user data. This command applies to linear storage only.

This command acts on all disks in a vdisk but not dedicated spares or leftover disks. This command will find and optionally fix parity mismatches for RAID 3, 5, 6, and 50, and mirror mismatches for RAID 1 and 10. This command can be performed only on a vdisk whose status is FTOL (fault tolerant and online). This command cannot be performed for NRAID or RAID 0.

Verification can last over an hour, depending on vdisk size, utility priority, and amount of I/O activity. You can use a vdisk while it is being verified. To view the progress of a verify (VRFY) job, use the `show vdisks` command.

When verification is complete, event 21 is logged and specifies the number of inconsistencies found. Such inconsistencies can indicate that a disk is going bad.

**NOTE:** The `scrub vdisk` command operates similarly to `verify vdisk` and can find media errors for any RAID level, including NRAID and RAID 0.

**Minimum role**
manage

**Syntax**

```
verify vdisk
[fix yes|no]
vdisks
```

**Parameters**

- `fix yes|no`

Alphabetical list of commands 271
Optional. Specifies whether or not to automatically fix parity mismatches by making parity match the data in all cases. The default is no.

vdisks
A comma-separated list of the names or serial numbers of the vdisks to verify. A name that includes a space must be enclosed in double quotes.

Examples
Start verifying vdisk vd1.

# verify vdisk vd1

See also
abort verify
scrub vdisk
show vdisks
verify disk-groups
Chapter 3 describes command output that is shown in console format. This chapter describes the basetype properties that CLI commands display in API format, and is organized to help you find a basetype by name. This chapter excludes basetypes that are for internal use only.

Each basetype topic includes the following information:

- References to CLI commands that directly use the basetype.
- For each property, the values of its name and type elements, and a description of the values that the property may show. For descriptions of other elements see XML API elements.
- References to embedded or nested basetypes that the output may show.

Topics:

- advanced-settings
- cache-parameter
- cache-settings
- certificate-status
- chap-records
- cli-parameters
- cloud-iq
- code-load-readiness
- code-load-readiness-reasons
- communication-ports
- compact-flash
- contact-information
- controller-cache-parameters
- controller-dns
- controllers
- controller-statistics
- copy-volumes
- cs-replicate-tasks
- cs-replication
- cs-replication-set
- current-replication-snapshots
- debug-log-parameters
- disk-groups
- disk-group-statistics
- disk-group-statistics-paged
- disk-hist-statistics
- disk-statistics
- dns-parameters
- drawers
- drive-parameters
- drive-summary
- drives
- email-parameters
- enclosure-fru
- enclosure-list
- enclosures
- events
- eventsLogs
- expander-ports
- expander-versions
- expanders
- fan
- fan-module-versions
- fan-modules
- fc-ports
- fde-state
- fenced-data
- fru-versions
- host
- host-group
- host-group-view
- host-port-statistics
- host-view-mappings
- initiator
- initiator-view
- inquiry
- io-modules
- iom-versions
- ipv6-network-parameters
- iscsi-parameters
- iscsi-port
- license
- local-ports
- local-ports-detail
- log-header-table
- mgmt-hostnames
- midplane-versions
- network-parameters
- ntp-status
- peer-connection-info
- peer-connections
- peer-controllers
- peer-ports
- pool-hist-statistics
- pool-statistics
- pool-summary
- pools
- port
- power-supplies
- product-info
- provisioning
- proxy-information
- psu-versions
- readcache-hist-statistics
- redundancy
- refresh-counters
- remote-ports
- remote-ports-detail
- remote-system
- replication-snapshot-history
- reset-snapshot-tasks
- resettable-statistics
- sas-host-phy-statistics
- sas-port
- sas-status-controller-a
- sas-status-drawer
- schedules
Table 6. advanced-settings-table properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>background-scrub</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Background disk-group scrub is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: Background disk-group scrub is enabled.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>background-scrub- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for background-scrub values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>background-scrub- interval</td>
<td>uint16</td>
<td>Shows the interval between background disk-group scrub finishing and starting again, from 0 to 360 hours.</td>
</tr>
<tr>
<td>partner-firmware-upgrade</td>
<td>string</td>
<td>Shows whether component firmware versions are monitored and will be automatically updated on the partner controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Partner firmware upgrade is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: Partner firmware upgrade is enabled.</td>
</tr>
<tr>
<td>partner-firmware-upgrade-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for partner-firmware-upgrade values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>utility-priority</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(This does not affect disk group background scrub, which always runs at &quot;background&quot; priority.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High: Utilities have higher priority than host I/O. This can cause heavy I/O to be slower than normal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Medium: Utility performance is balanced with host I/O performance.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Low: Utilities run at a slower rate with minimal effect on host I/O.</td>
</tr>
<tr>
<td>utility-priority-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for utility-priority values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Low</td>
</tr>
<tr>
<td>smart</td>
<td>string</td>
<td>Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Detect-Only: Each disk in the system retains its individual SMART setting, as will new disks added to the system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: SMART is enabled for all disks in the system and will be enabled for new disks added to the system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>smart-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for smart values.</td>
</tr>
</tbody>
</table>
|                    |               | • 0: Detect-Only  
|                    |               | • 1: Enabled  
|                    |               | • 2: Disabled  |
| dynamic-spares     | string        | Shows whether the storage system will automatically use a compatible disk as a spare to replace a failed disk in a disk group if no compatible spare is available. |
|                    |               | • Disabled: The dynamic spares feature is disabled.  
|                    |               | • Enabled: The dynamic spares feature is enabled.  |
| emp-poll-rate      | string        | Shows the interval in seconds at which the storage system will poll each enclosure’s Enclosure Management Processor (EMP) for status changes, from 5 to 3600 seconds. |
| host-cache-control | string        | Shows whether hosts are allowed to use the SCSI MODE SELECT command to change the storage system’s write-back cache setting.             |
|                    |               | • Disabled: Host control of caching is disabled.  
|                    |               | • Enabled: Host control of caching is enabled.                                              |
| sync-cache-mode    | string        | 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.                      |
| host-cache-control-numeric | uint32        | Numeric equivalents for host-cache-control values.                                                                                         |
|                    |               | • 0  
|                    |               | • 1: Enabled  |
| sync-cache-mode-numeric | uint32        | Numeric equivalents for sync-cache-mode values.                                                                                             |
|                    |               | • 0: Disabled: Immediate  
<p>|                    |               | • 1: Flush to Disk  |
| independent-cache  | string        | Shows the cache redundancy mode for a dual-controller storage system.                                                                        |
|                    |               | • Disabled: Controller failover is enabled and data in a controller’s write-back cache is mirrored to the partner controller.             |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>independent-cache- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for independent-cache values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>missing-lun- response</td>
<td>string</td>
<td>Shows whether host drivers may probe for LUNs until the host drivers reach the LUN to which they have access.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Not Ready</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Illegal Request</td>
</tr>
<tr>
<td>controller-failure</td>
<td>string</td>
<td>Shows whether the cache policy will change from write-back to write-through when a controller fails.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: The controller failure trigger is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The controller failure trigger is enabled.</td>
</tr>
<tr>
<td>controller- failure-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller-failure values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>super-cap-failure</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: The supercapacitor failure trigger is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The supercapacitor failure trigger is enabled.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>super-cap-failure-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for super-cap-failure values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>compact-flash-failure</td>
<td>string</td>
<td>Shows whether the cache policy will change from write-back to write-through when CompactFlash memory is not detected during POST (Power-On Self-Test), fails during POST, or fails during controller operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: The CompactFlash failure trigger is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The CompactFlash failure trigger is enabled.</td>
</tr>
<tr>
<td>compact-flash-failure-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for compact-flash-failure values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>power-supply-failure</td>
<td>string</td>
<td>Shows whether the cache policy will change from write-back to write-through when a power supply fails.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: The power-supply failure trigger is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The power-supply failure trigger is enabled.</td>
</tr>
<tr>
<td>power-supply-failure-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for power-supply-failure values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>fan-failure</td>
<td>string</td>
<td>Shows whether the cache policy will change from write-back to write-through when a fan fails.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: The fan failure trigger is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The fan failure trigger is enabled.</td>
</tr>
<tr>
<td>fan-failure-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for fan-failure values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>temperature-exceeded</td>
<td>string</td>
<td>Shows whether the system will shut down a controller when its temperature exceeds the critical operating range.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: The over-temperature trigger is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The over-temperature trigger is enabled.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>temperature-exceeded-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>temperature-exceeded</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>partner-notify</td>
<td>string</td>
<td>Shows whether the partner controller will be notified when a trigger condition occurs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Notification is disabled. The partner controller will continue using its current caching mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: Notification is enabled. The partner controller will change to write-through mode for better data protection.</td>
</tr>
<tr>
<td>partner-notify-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>partner-notify</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>auto-write-back</td>
<td>string</td>
<td>Shows whether the cache policy will change from write-through to write-back when the trigger condition is cleared.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Auto-write-back is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: Auto-write-back is enabled.</td>
</tr>
<tr>
<td>auto-write-back-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>auto-write-back</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>disk-dsd-enable</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Drive spin down for available disks and global spares is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: Drive spin down for available disks and global spares is enabled.</td>
</tr>
<tr>
<td>disk-dsd-enable-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>disk-dsd-enable</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>disk-dsd-delay</td>
<td>uint16</td>
<td>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.</td>
</tr>
<tr>
<td>background-disk-scrub</td>
<td>string</td>
<td>Shows whether disks that are not in disk groups are automatically checked for disk defects to ensure system health. The</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| interval between background disk scrub finishing and starting again is 72 hours. |                        | • Disabled: Background disk scrub is disabled.  
• Enabled: Background disk scrub is enabled. |
| background-disk-scrub-numeric | uint32                | Numeric equivalents for background-disk-scrub values.  
• 0: Disabled  
• 1: Enabled |
| managed-logs                  | string                | Shows whether the managed logs feature is enabled, which allows log files to be transferred from the storage system to a log-collection system to avoid losing diagnostic data as logs fill.  
• Disabled: The managed logs feature is disabled.  
• Enabled: The managed logs feature is enabled. |
| managed-logs-numeric          | uint32                | Numeric equivalents for managed-logs values.  
• 0: Disabled  
• 1: Enabled |
| single-controller            | string                | For a system that had two controller modules but now has only one and is intended to be used as a single-controller system, this property shows whether the operating/redundancy mode is set to Single Controller. This prevents the system from reporting the absent partner controller as an error condition. This parameter does not affect any other system settings. Installing a second, functional controller module will change the mode to Active-Active ULP.  
• Enabled: Single Controller mode is enabled.  
• Disabled: Single Controller mode is disabled. |
| single-controller-numeric    | string                | Numeric equivalents for single-controller values.  
• 0: Disabled  
• 1: Enabled |
<p>| 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. |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| auto-stall- recovery-numeric     | uint32  | Numeric equivalents for auto-stall-recovery values.  
  - 0: Disabled  
  - 1: Enabled                                                                                                      |
| restart-on-capi-fail             | string  | Shows whether a Storage Controller that experiences a CAPI hang will be forced to restart. A CAPI hang is perceived as a management-interface hang. As part of the restart process, a dump file is created and event 107 is logged. To provide the dump file to technical support for debugging, use the Save Logs action in the ME Storage Manager. |
| restart-on-capi-fail-numeric     | uint32  | Numeric equivalents for restart-on-capi-fail values.  
  - 0: Disabled  
  - 1: Enabled                                                                                                      |
| large-pools                      | string  | Shows whether the large-pools feature is enabled. This option provides the capability to create a virtual pool larger than 512 TiB on each controller by limiting the number of user-defined snapshots that can be created in snapshot trees.  
  - enabled or on: The maximum size for a virtual pool will increase to 1024 TiB (1 PiB). The maximum number of volumes per snapshot tree will decrease to 9 (base volume plus 8 snapshots).  
  - disabled or off: The maximum size for a virtual pool will increase to 512 TiB. The maximum number of volumes per snapshot tree will decrease to 255 (base volume plus 254 snapshots).                                                                 |
| large-pools-numeric              | uint32  | Numeric equivalents for large-pools values.  
  - 0: Disabled  
  - 1: Enabled                                                                                                      |
| random-io-performance-optimization| string  | Shows whether random I/O performance optimization is enabled or disabled.                                                                     |
| random-io-performance-optimization-numeric | uint32  |  
  - 0: Disabled  
  - 1: Enabled                                                                                                      |
| cache-flush-timeout              | string  | Shows whether the cache flush timeout is enabled or disabled.                                                                                     |
| cache-flush-timeout-numeric      | uint32  |  
  - 0: Disabled                                                                                                      |
### cache-parameter

This basetype is used by `show cache-parameters`, when a volume is specified, to show volume cache properties.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>serial-number</td>
<td>string</td>
<td>If a volume is specified, its serial number.</td>
</tr>
<tr>
<td>volume-name</td>
<td>string</td>
<td>If a volume is specified, its name.</td>
</tr>
<tr>
<td>write-policy</td>
<td>string</td>
<td>If a volume is specified, its cache write policy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• write-back: Write-back caching does not wait for data to be completely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>written to disk before signaling the host that the write is complete.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This is the preferred setting for a fault-tolerant environment because it</td>
</tr>
<tr>
<td></td>
<td></td>
<td>improves the performance of write operations and throughput.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• write-through: Write-through caching significantly impacts performance by</td>
</tr>
<tr>
<td></td>
<td></td>
<td>waiting for data to be completely written to disk before signaling the host</td>
</tr>
<tr>
<td></td>
<td></td>
<td>that the write is complete. Use this setting only when operating in an</td>
</tr>
<tr>
<td></td>
<td></td>
<td>environment with low or no fault tolerance.</td>
</tr>
<tr>
<td>write-policy-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for write-policy values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: write-through</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: write-back</td>
</tr>
<tr>
<td>cache-optimization</td>
<td>string</td>
<td>If a volume is specified, its cache optimization mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• standard: This controller cache mode of operation is optimized for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sequential and random I/O and is the optimization of choice for most</td>
</tr>
<tr>
<td></td>
<td></td>
<td>workloads. In this mode, the cache is kept coherent with the partner</td>
</tr>
<tr>
<td></td>
<td></td>
<td>controller. This mode gives you high performance and high redundancy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no-mirror: In this mode of operation, the controller cache performs the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>same as the standard mode with the exception that the cache metadata is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>not mirrored to the partner. While this improves the response time of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>write I/O, it comes at the cost of redundancy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If this option is used, the user can expect higher write performance but is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>exposed to data loss if a controller fails.</td>
</tr>
</tbody>
</table>
### Table 8. cache-settings properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cache-optimization-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cache-optimization values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: no-mirror</td>
</tr>
<tr>
<td>read-ahead-size</td>
<td>string</td>
<td>The volume’s read-ahead cache setting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disabled: Read-ahead is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Adaptive: Adaptive read-ahead is enabled, which allows the controller to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dynamically calculate the optimum read-ahead size for the current</td>
</tr>
<tr>
<td></td>
<td></td>
<td>workload.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Stripe: Read-ahead is set to one stripe. The controllers treat NRAID and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RAID-1 disk groups internally as if they have a stripe size of 512 KB,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>even though they are not striped.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 512 KB, 1 MB, 2 MB, 4 MB, 8 MB, 16 MB, or 32 MB: Size selected by a user.</td>
</tr>
<tr>
<td>read-ahead-size-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for read-ahead-size values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-2: Stripe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1: Adaptive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>524288: 512 KB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1048576: 1 MB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2097152: 2 MB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4194304: 4 MB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8388608: 8 MB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16777216: 16 MB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33554432: 32 MB</td>
</tr>
</tbody>
</table>

### cache-settings

This basetype is used by show cache-parameters to show system cache properties.

The system’s operating mode, also called the cache redundancy mode.

- Independent Cache Performance Mode: For a dual-controller system, controller failover is disabled and data in a controller’s write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.
• **Active-Active ULP**: Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance.
• **Single Controller**: The enclosure contains a single controller.
• **Failed Over**: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy.
• **Down**: Both controllers are not operational.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>operation-mode-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for operation-mode values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Independent Cache Performance Mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Active-Active ULP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Single Controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Failed Over</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: Down</td>
</tr>
<tr>
<td>controller-cache-parameters</td>
<td>Embedded, see controller-cache-parameters</td>
<td></td>
</tr>
</tbody>
</table>

### certificate-status

This basetype is used by `show certificate`.

**Table 9. certificate-status properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>controller</td>
<td>string</td>
<td>• A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• B: Controller B.</td>
</tr>
<tr>
<td>controller-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: B</td>
</tr>
<tr>
<td>certificate-status</td>
<td>string</td>
<td>• <strong>Customer-supplied</strong>: The controller is using a certificate that you have uploaded.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>System-generated</strong>: The controller is using system-generated certificates.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Unknown status</strong>: 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.</td>
</tr>
<tr>
<td>certificate-status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for certificate-status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Default</td>
</tr>
</tbody>
</table>
### chap-records

This basetype is used by `show chap-records`.

Table 10. chap-records properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>initiator-name</td>
<td>string</td>
<td>The originator name.</td>
</tr>
<tr>
<td>initiator-secret</td>
<td>string</td>
<td>The secret that the recipient uses to authenticate the originator.</td>
</tr>
<tr>
<td>oname</td>
<td>string</td>
<td>For mutual CHAP, the recipient name.</td>
</tr>
<tr>
<td>osecret</td>
<td>string</td>
<td>For mutual CHAP, the secret that the originator uses to authenticate the recipient.</td>
</tr>
</tbody>
</table>

### cli-parameters

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

Table 11. cli-parameters properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>timeout</td>
<td>uint32</td>
<td>Time in seconds that the session can be idle before it automatically ends. Valid values are 120–43200 seconds (2–720 minutes).</td>
</tr>
</tbody>
</table>
| 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 ME Storage Manager. |
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>output-format-api</td>
<td>string</td>
<td>• console&lt;br&gt;• api&lt;br&gt;• api-brief&lt;br&gt;• api-embed&lt;br&gt;• api-embed-brief&lt;br&gt;• json&lt;br&gt;• json-full</td>
</tr>
<tr>
<td>output-format-api-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>output-format-api</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: console&lt;br&gt;• 2: api&lt;br&gt;• 3: api-brief&lt;br&gt;• 4: api-embed&lt;br&gt;• 5: api-embed-brief&lt;br&gt;• 6: json&lt;br&gt;• 7: json-full</td>
</tr>
<tr>
<td>brief-mode</td>
<td>string</td>
<td>• Enabled: In XML output, this setting shows a subset of attributes of object properties. The name and type attributes are always shown.&lt;br&gt;• Disabled: In XML output, this setting shows all attributes of object properties.</td>
</tr>
<tr>
<td>brief-mode-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>brief-mode</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled&lt;br&gt;• 1: Enabled</td>
</tr>
<tr>
<td>base</td>
<td>uint8</td>
<td>Alias for <code>storage-size-base</code>.</td>
</tr>
<tr>
<td>pager</td>
<td>string</td>
<td>• Enabled: Halts output after each full screen to wait for keyboard input.&lt;br&gt;• Disabled: Output is not halted. When displaying output in API format, which is intended for scripting, disable paging.</td>
</tr>
<tr>
<td>pager-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>pager</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled&lt;br&gt;• 1: Enabled</td>
</tr>
<tr>
<td>locale</td>
<td>string</td>
<td>The display language.</td>
</tr>
<tr>
<td>locale-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>locale</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: English&lt;br&gt;• 3: Spanish&lt;br&gt;• 4: French&lt;br&gt;• 5: German&lt;br&gt;• 7: Japanese&lt;br&gt;• 8: Korean&lt;br&gt;• 11: Chinese-simplified</td>
</tr>
<tr>
<td>storage-size-base</td>
<td>uint8</td>
<td>Base for entry and display of storage-space sizes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude.&lt;br&gt;• 10: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>storage-size-precision</td>
<td>uint8</td>
<td>Number of decimal places (1–10) for display of storage-space sizes.</td>
</tr>
<tr>
<td>storage-size-units</td>
<td>string</td>
<td>Unit for display of storage-space sizes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Auto: Lets the system determine the proper unit for a size.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MB: Sizes are shown in megabytes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• GB: Sizes are shown in gigabytes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sizes are shown in terabytes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, if storage-size-units is set to TB, storage-size-precision is set to 1, and storage-size-base is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.</td>
</tr>
<tr>
<td>storage-size-units-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for storage-size-units values.</td>
</tr>
<tr>
<td>temperature-scale</td>
<td>string</td>
<td>• Fahrenheit: Temperatures are shown in degrees Fahrenheit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Celsius: Temperatures are shown in degrees Celsius.</td>
</tr>
<tr>
<td>temperature-scale-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for temperature-scale values.</td>
</tr>
<tr>
<td>user-type</td>
<td>string</td>
<td>The logged-in user’s experience level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Novice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Advanced</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Diagnostic</td>
</tr>
<tr>
<td>user-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for user-type values.</td>
</tr>
<tr>
<td>username</td>
<td>string</td>
<td>The logged-in user name.</td>
</tr>
<tr>
<td>usergroupname</td>
<td>string</td>
<td>The logged-in user group name. Shows the real name for an LDAP user or undefined for a local user.</td>
</tr>
<tr>
<td>management-mode</td>
<td>string</td>
<td>The management mode used in the current CLI session.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Linear: Uses linear-storage terminology in command output and system messages. For example, vdisk for disk groups and pools.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Virtual: Uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, disk group for disk groups and pool for pools.</td>
</tr>
<tr>
<td>management-mode-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for management-mode values.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>• 2: Linear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 3: Virtual</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**cloud-iq**

This basetype is used by `show cloudiq`.

**Table 12. chap-records properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cloud-iq</td>
<td>string</td>
<td>Shows whether the ability to remotely monitor the system by using the Dell EMC CloudIQ application is enabled or disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled – Use of the CloudIQ application is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled – Use of the CloudIQ application is disabled.</td>
</tr>
<tr>
<td>cloudiq-last-logssend-status</td>
<td>string</td>
<td>Specifies the status of the last transmission of CloudIQ log data to the support server.</td>
</tr>
<tr>
<td>cloudiq-last-logssend-time</td>
<td>string</td>
<td>Specifies the date/time of the last transmission of CloudIQ log data to the support server.</td>
</tr>
</tbody>
</table>

**code-load-readiness**

This basetype is used by `check firmware-upgrade-health`.

**Table 13. code-load-readiness properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>overall-health</td>
<td>string</td>
<td>• Pass: There are no risks to performing firmware upgrade.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fail: At least one condition exists that presents a risk of upgrade failure or loss of availability.</td>
</tr>
<tr>
<td>overall-health- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>overall-health</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Pass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Fail</td>
</tr>
<tr>
<td>code-load-readiness-reasons</td>
<td>Embedded; see code-load-readiness-reasons,</td>
<td></td>
</tr>
</tbody>
</table>

**code-load-readiness-reasons**

This basetype is used by `check firmware-upgrade-health`.

**Table 14. code-load-readiness-reasons properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>readiness-reason</td>
<td>string</td>
<td>The condition that was detected.</td>
</tr>
<tr>
<td>failure-risks</td>
<td>string</td>
<td>The problems that are likely to result if you do not resolve the conditions before performing a firmware upgrade.</td>
</tr>
<tr>
<td>failure-risks- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>failure-risks</code> values.</td>
</tr>
</tbody>
</table>
communication-ports
This basetype is used by show protocols.

Table 15. communication-ports properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ssh-port</td>
<td>uint16</td>
<td>The port number used for SSH.</td>
</tr>
<tr>
<td>sftp-port</td>
<td>uint16</td>
<td>The port number used for SFTP.</td>
</tr>
</tbody>
</table>

compact-flash
This basetype is used by show controllers.

Table 16. compact-flash properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>• Ctlr A CF: CompactFlash card in controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ctlr B CF: CompactFlash card in controller B.</td>
</tr>
<tr>
<td>controller-id</td>
<td>string</td>
<td>• A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• B: Controller B.</td>
</tr>
<tr>
<td>controller-id-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller-id values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: A</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>• Controller A CompactFlash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Controller B CompactFlash</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>• Not Installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Installed</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Not Installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Installed</td>
</tr>
<tr>
<td>cache-flush</td>
<td>string</td>
<td>• Enabled: If the controller loses power, it will automatically write cache</td>
</tr>
<tr>
<td></td>
<td></td>
<td>data to the CompactFlash card. Cache flush is normally enabled, but is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>temporarily disabled during controller shut down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Cache flush is disabled.</td>
</tr>
<tr>
<td>cache-flush-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cache-flush values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Fault</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended action to take to resolve the health issue.</td>
</tr>
</tbody>
</table>

**contact-information**

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

### Table 17. contact-information properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>company-name</td>
<td>string</td>
<td>The name of the customer.</td>
</tr>
<tr>
<td>company-country-territory</td>
<td>string</td>
<td>The country/territory code of the customer.</td>
</tr>
<tr>
<td>first-name</td>
<td>string</td>
<td>The first name of the customer contact.</td>
</tr>
<tr>
<td>last-name</td>
<td>string</td>
<td>The last name of the customer contact.</td>
</tr>
<tr>
<td>phone-number</td>
<td>string</td>
<td>The phone number of the customer contact.</td>
</tr>
<tr>
<td>alternate-phone-number</td>
<td>string</td>
<td>The alternate phone number of the customer contact.</td>
</tr>
<tr>
<td>email-address</td>
<td>string</td>
<td>The email address of the customer contact.</td>
</tr>
<tr>
<td>alternate-email-address</td>
<td>string</td>
<td>The alternate email address of the customer contact.</td>
</tr>
<tr>
<td>address-line1</td>
<td>string</td>
<td>The mailing address of the customer, including country/territory code.</td>
</tr>
<tr>
<td>address-line2</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>address-line3</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>address-city-town</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>address-country-territory</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>address-state-province-region</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>address-zip-postal-code</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>time-zone</td>
<td>string</td>
<td>The time zone of the customer.</td>
</tr>
<tr>
<td>preferred-contact-method</td>
<td>string</td>
<td>The preferred contact method: email or phone.</td>
</tr>
<tr>
<td>preferred-contact-hours-start-time</td>
<td>string</td>
<td>The preferred contact hours: start and end.</td>
</tr>
<tr>
<td>preferred-contact-hours-end-time</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>preferred-email-language</td>
<td>string</td>
<td>The preferred email language.</td>
</tr>
<tr>
<td>email-notifications</td>
<td>string</td>
<td>- Disabled – Email notifications are disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled – Email notifications are enabled.</td>
</tr>
<tr>
<td>email-notifications-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>email-notifications</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Enabled</td>
</tr>
</tbody>
</table>

API basetype properties 291
controller-cache-parameters

This basetype is used by `show cache-parameters` to show controller cache properties.

**Table 18. controller-cache-parameters properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>• cache-params-a: Cache parameters for controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• cache-params-b: Cache parameters for controller B.</td>
</tr>
<tr>
<td>controller-id</td>
<td>string</td>
<td>• A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• B: Controller B.</td>
</tr>
<tr>
<td>controller-id-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller-id values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: A</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>• Controller A Cache Parameters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Controller B Cache Parameters</td>
</tr>
<tr>
<td>write-back-status</td>
<td>string</td>
<td>Shows the current, system-wide cache policy as determined by auto-write-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>through logic. This value is not settable by users. If an auto-write-through</td>
</tr>
<tr>
<td></td>
<td></td>
<td>trigger condition (such as a CompactFlash failure) is met, the cache policy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for all volumes changes to write-through, overriding the volume-specific</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings. When the problem is corrected, the cache policy reverts to the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>value configured for each individual volume.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: Write-back. This is the normal state.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Write-through.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not up: The controller is not up.</td>
</tr>
<tr>
<td>write-back-status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for write-back-status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Enabled (write-back)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Disabled (write-through)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Not up</td>
</tr>
<tr>
<td>compact-flash-status</td>
<td>string</td>
<td>Numeric equivalents for compact-flash-status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Installed: The CompactFlash card is not installed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Installed: The CompactFlash card is installed.</td>
</tr>
<tr>
<td>compact-flash-status-numeric</td>
<td>uint32</td>
<td>• 0: Not Installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Installed</td>
</tr>
<tr>
<td>compact-flash-health</td>
<td>string</td>
<td>• OK</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>compact-flash-health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for compact-flash-health values.</td>
</tr>
<tr>
<td>cache-flush</td>
<td>string</td>
<td>Enabled: If the controller loses power, it will automatically write cache data to the CompactFlash card. Cache flush is normally enabled, but is temporarily disabled during controller shut down. Disabled: Cache flush is disabled.</td>
</tr>
<tr>
<td>cache-flush-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cache-flush values.</td>
</tr>
</tbody>
</table>

**controller-dns**

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

**Table 19. controller-dns properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>controller</td>
<td>string</td>
<td>A: Controller A. B: Controller B.</td>
</tr>
<tr>
<td>controller-numeric</td>
<td>uint32</td>
<td>0: B 1: A</td>
</tr>
<tr>
<td>name-servers</td>
<td>string</td>
<td>The controller's management host name.</td>
</tr>
<tr>
<td>search-domains</td>
<td>string</td>
<td>The controller's FQDN or '.'.</td>
</tr>
</tbody>
</table>

**controllers**

This basetype is used by `show configuration` and `show controllers`.

**Table 20. controllers properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>controller a controller b</td>
</tr>
<tr>
<td>controller-id</td>
<td>string</td>
<td>A: Controller A.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>controller-id- numeric</td>
<td>uint32</td>
<td>• B: Controller B.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>• Serial number of the controller module.</td>
</tr>
<tr>
<td>hardware-version</td>
<td>string</td>
<td>Controller module hardware version.</td>
</tr>
<tr>
<td>cpld-version</td>
<td>string</td>
<td>Complex Programmable Logic Device (CPLD) firmware version.</td>
</tr>
<tr>
<td>mac-address</td>
<td>string</td>
<td>Controller network port MAC address.</td>
</tr>
<tr>
<td>node-wwn</td>
<td>string</td>
<td>Storage system World Wide Node Name (WWNN).</td>
</tr>
<tr>
<td>ip-address</td>
<td>string</td>
<td>Controller network port IP address.</td>
</tr>
<tr>
<td>ip-subnet-mask</td>
<td>string</td>
<td>Controller network port IP subnet mask.</td>
</tr>
<tr>
<td>ip-gateway</td>
<td>string</td>
<td>Controller network port gateway IP address.</td>
</tr>
<tr>
<td>ip6-link-local-address</td>
<td>string</td>
<td>The link-local IPv6 address.</td>
</tr>
<tr>
<td>ip6-auto-address</td>
<td>string</td>
<td>The controller’s automatically configured IPv6 address, when applicable.</td>
</tr>
<tr>
<td>ip61-address</td>
<td>string</td>
<td>First IPv6 address for the controller management port, if set.</td>
</tr>
<tr>
<td>ip62-address</td>
<td>string</td>
<td>Second IPv6 address for the controller management port, if set.</td>
</tr>
<tr>
<td>ip63-address</td>
<td>string</td>
<td>Third IPv6 address for the controller management port, if set.</td>
</tr>
<tr>
<td>ip64-address</td>
<td>string</td>
<td>Fourth IPv6 address for the controller management port, if set.</td>
</tr>
<tr>
<td>disks</td>
<td>uint32</td>
<td>Number of disks in the storage system.</td>
</tr>
<tr>
<td>number-of-storage-pools</td>
<td>uint32</td>
<td>Number of virtual pools in the storage system.</td>
</tr>
<tr>
<td>virtual-disks</td>
<td>uint32</td>
<td>Number of disk groups in the storage system.</td>
</tr>
<tr>
<td>cache-memory-size</td>
<td>uint32</td>
<td>Controller cache memory size (MB).</td>
</tr>
<tr>
<td>system-memory-size</td>
<td>uint32</td>
<td>Controller module cache memory size, in MB, including CPU memory available to I/O.</td>
</tr>
<tr>
<td>host-ports</td>
<td>uint32</td>
<td>Number of host ports in the controller module.</td>
</tr>
<tr>
<td>drive-channels</td>
<td>uint32</td>
<td>Number of expansion ports in the controller enclosure.</td>
</tr>
<tr>
<td>drive-bus-type</td>
<td>string</td>
<td>Controller interface to disks.</td>
</tr>
<tr>
<td>drive-bus-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalent for drive-bus-type value.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>• Operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not installed</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Not installed</td>
</tr>
<tr>
<td>failed-over</td>
<td>string</td>
<td>Indicates whether the partner controller has failed over to this controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No: The partner controller has not failed over to this controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Yes: The partner controller has either failed or been shut down, and its</td>
</tr>
<tr>
<td></td>
<td></td>
<td>responsibilities have been taken over by this controller. There will be a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>delay between the time that the value of the status property becomes Down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for one controller and the time that the value of the failed-over property</td>
</tr>
<tr>
<td></td>
<td></td>
<td>becomes Yes for the other controller. This time period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>is the time that it takes for a controller to take over the responsibilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>of its partner.</td>
</tr>
<tr>
<td>failed-over-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for failed-over values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Yes</td>
</tr>
<tr>
<td>fail-over-reason</td>
<td>string</td>
<td>If failed-over is Yes, a reason for the failover appears; otherwise, Not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>applicable appears.</td>
</tr>
<tr>
<td>fail-over-reason-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for fail-over-reason values.</td>
</tr>
<tr>
<td>sc-fw</td>
<td>string</td>
<td>Storage Controller firmware version.</td>
</tr>
<tr>
<td>vendor</td>
<td>string</td>
<td>Controller manufacturer.</td>
</tr>
<tr>
<td>model</td>
<td>string</td>
<td>Controller model.</td>
</tr>
<tr>
<td>platform-type</td>
<td>string</td>
<td>Enclosure platform type.</td>
</tr>
<tr>
<td>platform-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for platform-type values.</td>
</tr>
<tr>
<td>multicore</td>
<td>string</td>
<td>Shows whether the controller module is using multiple application processing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cores.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: Multiple cores are active.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: A single core is active.</td>
</tr>
<tr>
<td>multicore-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for multicore values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Enabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Disabled</td>
</tr>
<tr>
<td>sc-cpu-type</td>
<td>string</td>
<td>Storage Controller processor type.</td>
</tr>
<tr>
<td>sc-cpu-speed</td>
<td>sint32</td>
<td>Storage Controller processor speed.</td>
</tr>
<tr>
<td>internal-serial-</td>
<td>string</td>
<td>Internal serial number of the controller.</td>
</tr>
<tr>
<td>number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cache-lock</td>
<td>string</td>
<td>Shows whether hosts are prevented from using the SCSI MODE SELECT command</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to change the storage system's write-back cache setting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No: Hosts are permitted to disable write-back cache.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Yes: Hosts are prevented from disabling write-back cache.</td>
</tr>
<tr>
<td>cache-lock-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cache-lock values.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| write-policy     | string     | The current, system-wide cache policy as determined by auto-write-through (AWT) logic. This value is not settable by users. If an AWT trigger condition (such as a CompactFlash failure) is met, the cache policy for all volumes changes to write-through, overriding the volume-specific settings. When the problem is corrected, the cache policy reverts to the value configured for each individual volume.  
|                  |            | • 0: No  
|                  |            | • 1: Yes  
| write-policy- numeric | uint32     | Numeric equivalents for `write-policy` values.  
|                  |            | • 0: write-back  
|                  |            | • 1: write-through  
|                  |            | • 2: Not up: The controller is not up.  
| description      | string     | FRU long description.  
| part-number      | string     | Part number for the FRU.  
| revision         | string     | Hardware revision level for the FRU.  
| dash-level       | string     | FRU template revision number.  
| fru-fullname      | string     | FRU short description.  
| mfg-date         | string     | Date and time, in the format `year-month-day hour:minutes:seconds (UTC)`, when the controller's PCBA was programmed.  
| mfg-date-numeric | uint32     | Unformatted `mfg-date` value.  
| mfg-location     | string     | City, state/province, and country where the FRU was manufactured.  
| mfg-vendor-id     | string     | JEDEC ID of the FRU manufacturer.  
| locator-led      | string     | Shows the state of the locator LED on a controller module.  
|                  |            | • Off  
|                  |            | • On  
| locator-led-numeric | uint32     | Numeric equivalents for `locator-led` values.  
|                  |            | • 0: Off  
|                  |            | • 1: On  
| ssd-alt-path-io-count | uint8     | The ratio of I/Os that alternate between the primary path and the alternate path to the SSDs. Thus, 2 means every second I/O will go to the alternate path, or 3 means every third I/O will go to the alternate path.  
| health           | string     |  
|                  |            | • OK  
|                  |            | • Degraded  
|                  |            | • Fault  
|                  |            | • Unknown  
|                  |            | • N/A  

**API basetype properties**

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<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended actions to take to resolve the health issue.</td>
</tr>
<tr>
<td>position</td>
<td>string</td>
<td>Position of the controller module, as viewed from the back of the enclosure.</td>
</tr>
<tr>
<td>position-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for position values.</td>
</tr>
<tr>
<td>rotation</td>
<td>string</td>
<td>Rotation of the controller module in the enclosure.</td>
</tr>
<tr>
<td>rotation-numeric</td>
<td>string</td>
<td>Numeric equivalents for position values.</td>
</tr>
<tr>
<td>phy-isolation</td>
<td>string</td>
<td>Shows whether the automatic disabling of SAS expander PHYs having high error counts is enabled or disabled for this controller.</td>
</tr>
<tr>
<td>phy-isolation-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for phy-isolation values.</td>
</tr>
<tr>
<td>redundancy-mode</td>
<td>string</td>
<td>The system’s operating mode, also called the cache redundancy mode. For a dual-controller system, controller failover is disabled and data in a controller’s write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
|                       |                 | • **Active-Active ULP**: Both controllers are active using ULP (Unified LUN Presentation). Data for volumes configured to use write-back cache is automatically mirrored between the two controllers to provide fault tolerance.  
• **Single Controller**: The enclosure contains a single controller.  
• **Failed Over**: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy. |
| redundancy-mode-numeric| uint32          | Numeric equivalents for redundancy-mode values.                                                                                             |
|                       |                 | • 1: Independent Cache Performance Mode  
• 2: Active-Active ULP  
• 3: Single Controller  
• 4: Failed Over  
• 5: Down |
| redundancy-status     | string          | • **Redundant with independent cache**: Both controllers are operational but are not mirroring their cache metadata to each other.  
• **Redundant**: Both controllers are operational.  
• **Operational but not redundant**: In active-active mode, one controller is operational and the other is offline. In single-controller mode, the controller is operational.  
• **Down**: This controller is not operational.  
• **Unknown**: Status information is not available. |
| redundancy-status-numeric| uint32          | Numeric equivalents for redundancy-status values.                                                                                           |
|                       |                 | • 0: Operational but not redundant  
• 1: Redundant with independent cache  
• 3: Redundant  
• 4: Down  
• 5: Unknown |
| unhealthy-component   | Embedded; see   | unhealthy-component.                                                                                                                        |
| ip-address            | Embedded; see   | network-parameters.                                                                                                                         |
| port-details          | Embedded; see   | port.                                                                                                                                         |
| enclosure-id          | Embedded; see   | expander-ports.                                                                                                                               |
| compact-flash         | Embedded; see   | compact-flash.                                                                                                                                |
| expander-details      | Embedded; see   | expanders.                                                                                                                                     |

**controller-statistics**

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

**Table 21. controller-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| durable-id | string  | • controller a  
• controller b                                          |
<p>| cpu-load   | uint32  | Percentage of time the CPU is busy, from 0 to 100. |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>power-on-time</td>
<td>uint32</td>
<td>Number of seconds since the controller was restarted.</td>
</tr>
<tr>
<td>write-cache-used</td>
<td>uint32</td>
<td>Percentage of write cache in use, from 0 to 100.</td>
</tr>
<tr>
<td>bytes-per-second</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>bytes-per-second-numeric</td>
<td>uint64</td>
<td>Unformatted bytes-per-second value.</td>
</tr>
<tr>
<td>iops</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>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.</td>
</tr>
<tr>
<td>read-cache-hits</td>
<td>uint64</td>
<td>For the controller that owns the volume, the number of times the block to be read is found in cache.</td>
</tr>
<tr>
<td>read-cache-misses</td>
<td>uint64</td>
<td>For the controller that owns the volume, the number of times the block to be read is not found in cache.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>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.</td>
</tr>
<tr>
<td>write-cache-hits</td>
<td>uint64</td>
<td>For the controller that owns the volume, the number of times the block written to is found in cache.</td>
</tr>
<tr>
<td>write-cache-misses</td>
<td>uint64</td>
<td>For the controller that owns the volume, the number of times the block written to is not found in cache.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>Amount of data read since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>Unformatted data-read value.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>Amount of data written since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>Unformatted data-written value.</td>
</tr>
<tr>
<td>num-forwarded-cmds</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>reset-time</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds, when these statistics were last reset, either by a user or by a controller restart.</td>
</tr>
<tr>
<td>reset-time-numeric</td>
<td>uint32</td>
<td>Unformatted reset-time value.</td>
</tr>
<tr>
<td>start-sample-time</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds, when sampling started for the iops and bytes-per-second values.</td>
</tr>
<tr>
<td>start-sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted start-sample-time value.</td>
</tr>
</tbody>
</table>
### stop-sample-time

**Type**: string

**Description**: Date and time, in the format `year-month-day hour:minutes:seconds`, when sampling stopped for the iops and bytes-per-second values.

### stop-sample-time-numeric

**Type**: uint32

**Description**: Unformatted stop-sample-time value.

### total-power-on-hours

**Type**: string

**Description**: The total amount of hours the controller has been powered on in its life time.

### copy-volumes

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

**Table 22. copy-volumes properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>source-volume</td>
<td>string</td>
<td>The name of the source volume.</td>
</tr>
<tr>
<td>source-volume-serial</td>
<td>string</td>
<td>The serial number of the source volume.</td>
</tr>
<tr>
<td>source-type</td>
<td>string</td>
<td>The type of the source volume: Virtual or Linear.</td>
</tr>
<tr>
<td>source-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for source-type values.</td>
</tr>
<tr>
<td>source-pool-name</td>
<td>string</td>
<td>The name of the source pool: A or B.</td>
</tr>
<tr>
<td>destination-volume</td>
<td>string</td>
<td>The name of the destination volume.</td>
</tr>
<tr>
<td>destination-volume-serial</td>
<td>string</td>
<td>The serial number of the destination volume.</td>
</tr>
<tr>
<td>destination-type</td>
<td>string</td>
<td>The type of the destination volume.</td>
</tr>
<tr>
<td>destination-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for destination-type values.</td>
</tr>
<tr>
<td>destination-pool-name</td>
<td>string</td>
<td>The name of the destination pool: A or B.</td>
</tr>
<tr>
<td>progress</td>
<td>string</td>
<td>The percent complete of the operation.</td>
</tr>
</tbody>
</table>

### cs-replicate-tasks

This basetype is used by `show schedules`.

**Table 23. cs-replicate-tasks properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>replication-set-name</td>
<td>string</td>
<td>The name of the replication set.</td>
</tr>
<tr>
<td>replication-set-serialnum</td>
<td>string</td>
<td>The serial number of the replication set.</td>
</tr>
<tr>
<td>replicate-last-snapshot</td>
<td>string</td>
<td>• False: The primary volume will be replicated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• True: The most recent snapshot of the primary volume will be replicated.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>replicate-last-snapshot-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for replicate-last-snapshot values.</td>
</tr>
<tr>
<td>• 0: False</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 1: True</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**cs-replication**

This basetype is used by `show replication-sets`.

**Table 24. cs-replication-set properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>replication-state</td>
<td>string</td>
<td>• Last Run</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Current Run</td>
</tr>
<tr>
<td>replication-state-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for replication-state values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Last Run</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Current Run</td>
</tr>
<tr>
<td>image-generation</td>
<td>sint32</td>
<td>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.</td>
</tr>
<tr>
<td>progress</td>
<td>string</td>
<td>The percentage complete of the active replication. Otherwise, N/A.</td>
</tr>
<tr>
<td>total-data-transferred</td>
<td>string</td>
<td>The total number of bytes transferred.</td>
</tr>
<tr>
<td>total-data-transferred-numeric</td>
<td>uint64</td>
<td>Unformatted total-data-transferred value.</td>
</tr>
<tr>
<td>collection-time</td>
<td>uint32</td>
<td>The date and time when the replication data shown by this command was collected.</td>
</tr>
<tr>
<td>collection-time-numeric</td>
<td>uint32</td>
<td>Unformatted collection-time value.</td>
</tr>
<tr>
<td>time-start</td>
<td>string</td>
<td>The date and time when the replication started.</td>
</tr>
<tr>
<td>time-start-numeric</td>
<td>uint32</td>
<td>Unformatted time-start value.</td>
</tr>
<tr>
<td>time-end</td>
<td>string</td>
<td>The date and time when the replication ended.</td>
</tr>
<tr>
<td>time-end-numeric</td>
<td>uint32</td>
<td>Unformatted time-end value.</td>
</tr>
<tr>
<td>estimated-time-completion</td>
<td>string</td>
<td>The date and time when the replication is estimated to end.</td>
</tr>
<tr>
<td>estimated-time-completion-numeric</td>
<td>uint32</td>
<td>Unformatted estimated-time-completion value.</td>
</tr>
<tr>
<td>most-recent-suspend-time</td>
<td>string</td>
<td>The most recent time that the replication was suspended.</td>
</tr>
<tr>
<td>most-recent-suspend-time-numeric</td>
<td>uint32</td>
<td>Unformatted most-recent-suspend-time value.</td>
</tr>
<tr>
<td>num-seconds-suspended</td>
<td>uint32</td>
<td>The amount of time, in seconds, that the replication was suspended.</td>
</tr>
<tr>
<td>suspend-count</td>
<td>uint32</td>
<td>The number of times the replication was suspended.</td>
</tr>
<tr>
<td>error-count</td>
<td>uint32</td>
<td>The number of times the replication experienced an error.</td>
</tr>
</tbody>
</table>
### cs-replication-set

This basetype is used by `show replication-sets` for a virtual replication set.

#### Table 25. cs-replication-set-properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-error</td>
<td>string</td>
<td>A message that says whether the replication succeeded or an error occurred.</td>
</tr>
</tbody>
</table>

#### cs-replication-set

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The replication set name.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The replication set serial number.</td>
</tr>
<tr>
<td>group</td>
<td>string</td>
<td>• Yes: The replication set is part of a group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No: The replication set is not part of a group.</td>
</tr>
<tr>
<td>group-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for group values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Yes</td>
</tr>
<tr>
<td>primary-location</td>
<td>string</td>
<td>The location of the primary volume in the replication set: Local or Remote.</td>
</tr>
<tr>
<td>primary-location-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>primary-location</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Remote</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Local</td>
</tr>
<tr>
<td>peer-connection-name</td>
<td>string</td>
<td>The name of the peer connection.</td>
</tr>
<tr>
<td>peer-connection-serial</td>
<td>string</td>
<td>The serial number of the peer connection.</td>
</tr>
<tr>
<td>primary-volume-name</td>
<td>string</td>
<td>The primary volume name. If it is a volume group, it uses the .* notation.</td>
</tr>
<tr>
<td>primary-volume-serial</td>
<td>string</td>
<td>The serial number of the primary volume.</td>
</tr>
<tr>
<td>secondary-volume-name</td>
<td>string</td>
<td>The secondary volume name. If it is a volume group, it uses the .* notation.</td>
</tr>
<tr>
<td>secondary-volume-serial</td>
<td>string</td>
<td>The serial number of the secondary volume.</td>
</tr>
<tr>
<td>sync-job-active</td>
<td>string</td>
<td>• False: No replication is in progress on the replication set.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• True: A replication is currently in progress on the replication set.</td>
</tr>
<tr>
<td>sync-job-active-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>sync-job-active</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: False</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: True</td>
</tr>
<tr>
<td>queue-policy</td>
<td>string</td>
<td>The action to take when a replication is running and a new replication is requested.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• discard: Discard the new replication request.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td>queue-policy-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>queue-policy</code> values.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>queue-count</td>
<td>uint8</td>
<td>The number of queued replications for the replication set; either 0 or 1.</td>
</tr>
<tr>
<td>snapshot-history</td>
<td>string</td>
<td>Specifies whether to maintain a replication snapshot history for the replication set.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- disabled or off: A snapshot history will not be kept.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- secondary: A snapshot history set will be kept on the secondary system for the secondary volume.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- both: A snapshot history will be kept for the primary volume on the primary system and for the secondary volume on the secondary system.</td>
</tr>
<tr>
<td>snapshot-history-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for snapshot-history values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: secondary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: both</td>
</tr>
<tr>
<td>snapshot-count</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>snapshot-basename</td>
<td>string</td>
<td>The user-defined prefix for the snapshots.</td>
</tr>
<tr>
<td>retention-priority</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- high: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- medium: Snapshots can be deleted after all eligible low-priority snapshots have been deleted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- low: Snapshots can be deleted.</td>
</tr>
<tr>
<td>retention-priority-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for retention-priority-numeric values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: never-delete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: high</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>- Not Ready: The replication set is not ready for replications because the system is still preparing the replication set.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Unsynchronized: The primary and secondary volumes are unsynchronized because the system has prepared the replication set, but the initial replication has not run.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Running: A replication is in progress.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Ready: The replication set is ready for a replication.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Suspended: Replications have been suspended.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 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.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td>failback-in-progress</td>
<td>string</td>
<td>Not supported.</td>
</tr>
<tr>
<td>failback-in-progress-numeric</td>
<td>uint32</td>
<td>Not supported.</td>
</tr>
<tr>
<td>failback-sync-complete</td>
<td>string</td>
<td>Not supported.</td>
</tr>
<tr>
<td>failback-sync-complete-numeric</td>
<td>uint32</td>
<td>Not supported.</td>
</tr>
<tr>
<td>last-success-time</td>
<td>string</td>
<td>The date and time when the system took a snapshot of the primary volume in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>preparation for starting the last successful replication run. The value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>shows when the primary and secondary volumes were last known to be in sync.</td>
</tr>
<tr>
<td>last-success-time-numeric</td>
<td>uint32</td>
<td>Unformatted last-success-time value.</td>
</tr>
<tr>
<td>last-success-generation</td>
<td>sint32</td>
<td>The number of times a replication has successfully completed.</td>
</tr>
<tr>
<td>last-run-status</td>
<td>string</td>
<td>The status of the last attempted replication.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A: The replication has not yet completed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Success: The replication completed successfully.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fail: The replication failed.</td>
</tr>
<tr>
<td>last-run-status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for last-run-status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Success</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Fail</td>
</tr>
<tr>
<td>estimated-time-completion</td>
<td>string</td>
<td>For the current run, the date and time when the replication is estimated to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>end. If no replication is in progress, N/A.</td>
</tr>
<tr>
<td>estimated-time-completion-numeric</td>
<td>uint32</td>
<td>Unformatted estimated-time-completion value.</td>
</tr>
<tr>
<td>previous-replication-run</td>
<td>Embedded; see cs-replication</td>
<td></td>
</tr>
<tr>
<td>current-replication-run</td>
<td>Embedded; see cs-replication</td>
<td></td>
</tr>
<tr>
<td>current-replication-snapshots</td>
<td>Embedded; see current-replication-snapshots</td>
<td></td>
</tr>
</tbody>
</table>

**current-replication-snapshots**

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

**Table 26. current-replication-snapshots properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The snapshot serial number.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>The snapshot name.</td>
</tr>
<tr>
<td>creation-date-time</td>
<td>string</td>
<td>The date and time when the snapshot was prepared or committed.</td>
</tr>
</tbody>
</table>
## debug-log-parameters

This basetype is used by `show debug-log-parameters`.

### Table 27. debug-log-parameters properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| host-dbg       | string   | Shows whether host interface debug messages are enabled for inclusion in the Storage Controller debug log.  
|                |          | • Off: Disabled.                                                            |
|                |          | • On: Enabled.                                                              |
| host-dbg-numeric | uint32   | Numeric equivalents for `host` values.                                      |
|                |          | • 0: Off                                                                   |
|                |          | • 1: On                                                                    |
| disk           | string   | Shows whether disk interface debug messages are enabled for inclusion in the Storage Controller debug log.  
|                |          | • Off: Disabled.                                                            |
|                |          | • On: Enabled.                                                              |
| disk-numeric   | uint32   | Numeric equivalents for `disk` values.                                      |
|                |          | • 0: Off                                                                   |
|                |          | • 1: On                                                                    |
| mem            | string   | Shows whether internal memory debug messages are enabled for inclusion in the Storage Controller debug log.  
|                |          | • Off: Disabled.                                                            |
|                |          | • On: Enabled.                                                              |
| mem-numeric    | uint32   | Numeric equivalents for `mem` values.                                       |
|                |          | • 0: Off                                                                   |
|                |          | • 1: On                                                                    |
| fo             | string   | Shows whether failover and recovery debug messages are enabled for inclusion in the Storage Controller debug log.  
<p>|                |          | • Off: Disabled.                                                            |
|                |          | • On: Enabled.                                                              |
| fo-numeric     | uint32   | Numeric equivalents for <code>fo</code> values.                                        |
|                |          | • 0: Off                                                                   |
|                |          | • 1: On                                                                    |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>msg</td>
<td>string</td>
<td>Shows whether inter-controller message debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numeric equivalents for msg values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>msg-numeric</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>ioa</td>
<td>string</td>
<td>Shows whether standard debug messages for an I/O interface driver are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numeric equivalents for ioa values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>ioa-numeric</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>iob</td>
<td>string</td>
<td>Shows whether resource-count debug messages for an I/O interface driver are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numeric equivalents for iob values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>iob-numeric</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>ioc</td>
<td>string</td>
<td>Shows whether upper-layer, verbose debug messages for an I/O interface driver are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numeric equivalents for ioc values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>ioc-numeric</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>iod</td>
<td>string</td>
<td>Shows whether lower-layer, verbose debug messages for an I/O interface driver are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numeric equivalents for iod values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>iod-numeric</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>misc</td>
<td>string</td>
<td>Shows whether internal debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numeric equivalents for misc values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td>misc-numeric</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>host2</td>
<td>string</td>
<td>Shows whether host/SCSI debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>host2-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for host2 values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>raid</td>
<td>string</td>
<td>Shows whether RAID debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>raid-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for raid values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>cache</td>
<td>string</td>
<td>Shows whether cache debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>cache-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cache values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>emp</td>
<td>string</td>
<td>Shows whether Enclosure Management Processor debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>emp-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for emp values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>capi</td>
<td>string</td>
<td>Shows whether Internal Configuration API debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>capi-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for capi values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>mui</td>
<td>string</td>
<td>Shows whether internal service interface debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>mui-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for mui values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>bkcfg</td>
<td>string</td>
<td>Shows whether internal configuration debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>bkcfg-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for bkcfg values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>awt</td>
<td>string</td>
<td>Shows whether debug messages for auto-write-through cache triggers are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>awt-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for awt values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>res2</td>
<td>string</td>
<td>Shows whether internal debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>res2-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for res2 values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>capi2</td>
<td>string</td>
<td>Shows whether Internal Configuration API tracing messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>capi2-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for capi2 values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>dms</td>
<td>string</td>
<td>Not used.</td>
</tr>
<tr>
<td>dms-numeric</td>
<td>uint32</td>
<td>Not used.</td>
</tr>
<tr>
<td>fruid</td>
<td>string</td>
<td>Shows whether FRU ID debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: Enabled.</td>
</tr>
<tr>
<td>fruid-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for fruid values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>resmgr</td>
<td>string</td>
<td>Shows whether Reservation Manager debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td>resmgr-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for resmgr values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>init</td>
<td>string</td>
<td>Shows whether host-port initiator mode debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td>init-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for init values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>ps</td>
<td>string</td>
<td>Shows whether paged storage debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td>ps-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for ps values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>cache2</td>
<td>string</td>
<td>Shows whether extra cache debugging messages that may occur frequently enough to fill logs are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td>cache2-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cache2 values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>rtm</td>
<td>string</td>
<td>Shows whether Remote Target Manager debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td>rtm-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for rtm values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: On</td>
</tr>
<tr>
<td>hb</td>
<td>string</td>
<td>Shows whether inter-controller heartbeat debug messages are enabled for inclusion in the Storage Controller debug log.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off: Disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- On: Enabled.</td>
</tr>
<tr>
<td>hb-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for hb values.</td>
</tr>
</tbody>
</table>
### Table 28. disk-groups properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the disk group.</td>
</tr>
<tr>
<td>url</td>
<td>string</td>
<td>Disk group URL.</td>
</tr>
<tr>
<td>blocksize</td>
<td>uint32</td>
<td>The size of a block, in bytes.</td>
</tr>
<tr>
<td>size</td>
<td>string</td>
<td>Disk group capacity, formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>size-numeric</td>
<td>uint64</td>
<td>Unformatted size value in blocks.</td>
</tr>
<tr>
<td>freespace</td>
<td>string</td>
<td>The amount of free space in the disk group, formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>freespace-numeric</td>
<td>uint64</td>
<td>Unformatted freespace value in blocks.</td>
</tr>
<tr>
<td>raw-size</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>raw-size-numeric</td>
<td>uint64</td>
<td>Unformatted raw-size value in blocks.</td>
</tr>
<tr>
<td>storage-type</td>
<td>string</td>
<td>- Linear: The disk group acts as a linear pool.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Virtual: The disk group is in a virtual pool.</td>
</tr>
<tr>
<td>storage-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for storage-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Linear</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>pool</td>
<td>string</td>
<td>The name of the pool that contains the disk group.</td>
</tr>
<tr>
<td>pools-url</td>
<td>string</td>
<td>Pool URL.</td>
</tr>
<tr>
<td>pool-serial-number</td>
<td>string</td>
<td>The serial number of the pool that contains the disk group.</td>
</tr>
<tr>
<td>storage-tier</td>
<td>string</td>
<td>- Archive: The disk group is in the lowest storage tier, which uses midline spinning SAS disks (&lt;10k RPM, high capacity).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Performance: The disk group is in the highest storage tier, which uses SSDs (high speed).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Read Cache: The disk is an SSD providing high-speed read cache for a storage pool.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Standard: The disk group is in the storage tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).</td>
</tr>
<tr>
<td>storage-tier-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for storage-tier values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 4: Archive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 8: Read Cache</td>
</tr>
<tr>
<td>total-pages</td>
<td>uint32</td>
<td>For a virtual disk group, the total number of 4 MB pages it contains. For a linear disk group, 0.</td>
</tr>
<tr>
<td>allocated-pages</td>
<td>uint32</td>
<td>For a virtual pool, the number of 4 MB pages that are currently in use. For a linear pool, 0.</td>
</tr>
<tr>
<td>available-pages</td>
<td>uint32</td>
<td>For a virtual pool, the number of 4 MB pages that are still available to be allocated. For a linear pool, 0.</td>
</tr>
<tr>
<td>pool-percentage</td>
<td>uint8</td>
<td>The percentage of pool capacity that the disk group occupies.</td>
</tr>
<tr>
<td>performance-rank</td>
<td>uint8</td>
<td>Disk group performance rank within the virtual pool.</td>
</tr>
<tr>
<td>owner</td>
<td>string</td>
<td>Either the preferred owner during normal operation or the partner controller when the preferred owner is offline.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- B: Controller B.</td>
</tr>
<tr>
<td>owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for owner values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: A</td>
</tr>
<tr>
<td>preferred-owner</td>
<td>string</td>
<td>Controller that owns the disk group and its volumes during normal operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- B: Controller B.</td>
</tr>
<tr>
<td>preferred-owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for preferred-owner values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: A</td>
</tr>
<tr>
<td>raidtype</td>
<td>string</td>
<td>The RAID level of the disk group.</td>
</tr>
</tbody>
</table>
## API basetype properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
|                  |        | • NRAID  
|                  |        | • RAID0  
|                  |        | • RAID1  
|                  |        | • RAID3  
|                  |        | • RAID5  
|                  |        | • RAID6  
|                  |        | • RAID10 
|                  |        | • RAID50  
|                  |        | • ADAPT |
| raidtype-numeric | uint32 | Numeric equivalents for `raidtype` values.  
|                  |        | • 0: RAID0  
|                  |        | • 1: RAID1  
|                  |        | • 2: ADAPT  
|                  |        | • 3: RAID3  
|                  |        | • 5: RAID5  
|                  |        | • 6: NRAID  
|                  |        | • 8: RAID50  
|                  |        | • 10: RAID10 
|                  |        | • 11: RAID6 |
| diskcount        | uint16 | Number of disks in the disk group.  
| sparecount       | uint16 | For a linear disk group, the number of spares assigned to the disk group. For a virtual disk group, 0. |
| chunksize        | string | • For RAID levels except NRAID, RAID 1, and RAID 50, the chunk size for the disk group.  
|                  |        | • For NRAID and RAID 1, chunk-size has no meaning and is therefore shown as not applicable (N/A).  
|                  |        | • For RAID 50, the disk-group chunk size calculated as: `configured-chunk-size x (subgroup-members - 1)`. For a disk group configured to use 64-KB chunk size and 4-disk subgroups, the value would be 192k (64KB x 3). |
| status           | string | • CRIT: Critical. The disk group is online but isn't fault tolerant because some of its disks are down.  
|                  |        | • DMGD: Damaged. The disk group is online and fault tolerant, but some of its disks are damaged.  
|                  |        | • FTDN: Fault tolerant with a down disk. The disk group is online and fault tolerant, but some of its disks are down.  
|                  |        | • FTOL: Fault tolerant and online.  
|                  |        | • MSNG: Missing. The disk group is online and fault tolerant, but some of its disks are missing.  
|                  |        | • OFFL: Offline. Either the disk group is using offline initialization, or its disks are down and data may be lost.  
|                  |        | • QTCR: Quarantined critical. The disk group is critical with at least one inaccessible disk. For example, two disks are inaccessible in a RAID-6 disk group or one disk is inaccessible for other fault-tolerant RAID levels. If the inaccessible disks come online or if after 60 seconds from being quarantined the disk group is QTCR or QTDN, the disk group is automatically dequarantined.  
<p>|                  |        | • 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. |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>QTOF</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>STOP</td>
<td></td>
<td>The disk group is stopped.</td>
</tr>
<tr>
<td>UNKN</td>
<td></td>
<td>Unknown.</td>
</tr>
<tr>
<td>UP</td>
<td></td>
<td>Up. The disk group is online and does not have fault-tolerant attributes.</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td>lun</td>
<td>uint32</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>min-drive-size</td>
<td>string</td>
<td>Minimum disk size that can this disk group can use, formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>min-drive-size-numeric</td>
<td>uint64</td>
<td>Numeric equivalents for min-drive-size values.</td>
</tr>
<tr>
<td>create-date</td>
<td>string</td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds (UTC)</code>, when the disk group was created.</td>
</tr>
<tr>
<td>create-date-numeric</td>
<td>uint32</td>
<td>Unformatted <code>create-date</code> value.</td>
</tr>
<tr>
<td>cache-read-ahead</td>
<td>string</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>cache-read-ahead-numeric</td>
<td>uint64</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>cache-flush-period</td>
<td>uint32</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>read-ahead-enabled</td>
<td>string</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>read-ahead-enabled-numeric</td>
<td>uint32</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>write-back-enabled</td>
<td>string</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>write-back-enabled-numeric</td>
<td>uint32</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>job-running</td>
<td>string</td>
<td>Same as current-job.</td>
</tr>
<tr>
<td>current-job</td>
<td>string</td>
<td>current-job string Job running on the disk group, if any.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• DRSC: A disk is being scrubbed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• EXPD: The disk group is being expanded.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• INIT: The disk group is initializing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• RBAL: The ADAPT disk group is being rebalanced.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>current-job-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for current-job values.</td>
</tr>
<tr>
<td>current-job-completion</td>
<td>string</td>
<td>• 0%–99%: Percent complete of running job.</td>
</tr>
<tr>
<td>current-job-completion</td>
<td>string</td>
<td>• (blank): No job is running (job has completed).</td>
</tr>
<tr>
<td>num-array-partitions</td>
<td>uint32</td>
<td>Number of volumes in the disk group.</td>
</tr>
<tr>
<td>largest-free-partition-space</td>
<td>string</td>
<td>The largest contiguous space in which a volume can be created. The value is formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>largest-free-partition-space-numeric</td>
<td>uint64</td>
<td>Unformatted largest-free-partition-space value in blocks.</td>
</tr>
<tr>
<td>num-drives-per-low-level-array</td>
<td>uint8</td>
<td>• For a RAID-10 or RAID-50 disk group, the number of disks in each subgroup.</td>
</tr>
<tr>
<td>num-drives-per-low-level-array</td>
<td>uint8</td>
<td>• For other RAID levels, 1.</td>
</tr>
<tr>
<td>num-partition-segments</td>
<td>uint8</td>
<td>Not used.</td>
</tr>
<tr>
<td>num-partition-segments</td>
<td>uint8</td>
<td>Number of free segments available for expansion of volumes.</td>
</tr>
<tr>
<td>new-partition-lba</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>new-partition-lba-numeric</td>
<td>uint64</td>
<td>Unformatted new-partition-lba value in blocks.</td>
</tr>
<tr>
<td>array-drive-type</td>
<td>string</td>
<td>Type of disks used in the disk group.</td>
</tr>
<tr>
<td>array-drive-type</td>
<td>string</td>
<td>• SAS: Enterprise SAS</td>
</tr>
<tr>
<td>array-drive-type</td>
<td>string</td>
<td>• SAS MDL: Midline SAS.</td>
</tr>
<tr>
<td>array-drive-type</td>
<td>string</td>
<td>• sSAS: SAS SSD.</td>
</tr>
<tr>
<td>array-drive-type</td>
<td>string</td>
<td>• MIXED: Mixture of enterprise SAS and midline SAS disks</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>array-drive-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for array-drive-type values.</td>
</tr>
<tr>
<td>is-job-auto-abortable</td>
<td>string</td>
<td>• false: The current job must be manually aborted before you can delete the disk group.</td>
</tr>
<tr>
<td>is-job-auto-abortable-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for is-job-auto-abortable values.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Disk group serial number.</td>
</tr>
<tr>
<td>blocks</td>
<td>string</td>
<td>The number of blocks, whose size is specified by the blocksize property.</td>
</tr>
<tr>
<td>blocks-numeric</td>
<td>uint64</td>
<td>Unformatted blocks value.</td>
</tr>
<tr>
<td>disk-dsd-enable-vdisk</td>
<td>string</td>
<td>• Disabled: DSD is disabled for the disk group</td>
</tr>
<tr>
<td>disk-dsd-enable-vdisk-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for disk-dsd-enable-vdisk values.</td>
</tr>
<tr>
<td>disk-dsd-delay-vdisk</td>
<td>uint32</td>
<td>For spinning disks in a linear disk group, the period of inactivity after which the disks and dedicated spares will automatically spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.</td>
</tr>
<tr>
<td>adapt-target-spare-capacity</td>
<td>string</td>
<td>For an ADAPT disk group, the target spare capacity in GiB. Typically twice the capacity of the largest disk in the disk group.</td>
</tr>
<tr>
<td>adapt-target-spare-capacity-numeric</td>
<td>uint64</td>
<td>Unformatted adapt-target-spare-capacity value in blocks.</td>
</tr>
<tr>
<td>adapt-actual-spare-capacity</td>
<td>string</td>
<td>For an ADAPT disk group, the currently available spare capacity in GiB.</td>
</tr>
<tr>
<td>adapt-actual-spare-capacity-numeric</td>
<td>uint64</td>
<td>Unformatted adapt-actual-spare-capacity value in blocks.</td>
</tr>
<tr>
<td>adapt-critical-capacity</td>
<td>string</td>
<td>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.)</td>
</tr>
<tr>
<td>adapt-critical-capacity-numeric</td>
<td>uint64</td>
<td>Unformatted adapt-critical-capacity value in blocks.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>adapt-degraded-capacity</td>
<td>string</td>
<td>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.)</td>
</tr>
<tr>
<td>adapt-degraded-capacity-numeric</td>
<td>uint64</td>
<td>Unformatted adapt-degraded-capacity value in blocks.</td>
</tr>
<tr>
<td>adapt-linear-volume-boundary</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>pool-sector-format</td>
<td>string</td>
<td>The sector format of disks in the disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 512n: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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).</td>
</tr>
<tr>
<td>pool-sector-format-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for pool-sector-format values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: 512n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: 512e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Mixed</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: N/A</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended actions to take to resolve the health issue.</td>
</tr>
<tr>
<td>unhealthy-component</td>
<td>Embedded; see unhealthy-component.</td>
<td></td>
</tr>
</tbody>
</table>

**disk-group-statistics**

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

**Table 29. disk-group-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the disk group.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the disk group.</td>
</tr>
<tr>
<td>time-since-reset</td>
<td>uint32</td>
<td>The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.</td>
</tr>
<tr>
<td>time-since-sample</td>
<td>uint32</td>
<td>The amount of time, in milliseconds, since this set of statistics was last sampled by the Storage Controller.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>Number of read operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>Number of write operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>Amount of data read since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>Unformatted data-read value.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>Amount of data written since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>Unformatted data-written value.</td>
</tr>
<tr>
<td>bytes-per-second</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>bytes-per-second-numeric</td>
<td>uint64</td>
<td>Unformatted bytes-per-second value.</td>
</tr>
<tr>
<td>iops</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>avg-rsp-time</td>
<td>uint32</td>
<td>Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.</td>
</tr>
<tr>
<td>avg-read-rsp-time</td>
<td>uint32</td>
<td>Average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.</td>
</tr>
<tr>
<td>avg-write-rsp-time</td>
<td>uint32</td>
<td>Average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.</td>
</tr>
</tbody>
</table>

**disk-group-statistics-paged**

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

**Table 30. disk-group-statistics-paged**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the disk group.</td>
</tr>
<tr>
<td>pages.alloc-per-minute</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>pages-dealloc-per-minute</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>pages-reclaimed</td>
<td>uint32</td>
<td>The number of 4 MB pages that have been automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).</td>
</tr>
<tr>
<td>num-pages-unmap-per-minute</td>
<td>uint32</td>
<td>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.</td>
</tr>
</tbody>
</table>

**disk-hist-statistics**

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

**Table 31. disk-hist-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number-of-ios</td>
<td>uint64</td>
<td>Total number of read and write operations since the last sampling time.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>Number of read operations since the last sampling time.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>Number of write operations since the last sampling time.</td>
</tr>
<tr>
<td>total-data-transferred</td>
<td>string</td>
<td>Total amount of data read and written since the last sampling time.</td>
</tr>
<tr>
<td>total-data-transferred-numeric</td>
<td>uint64</td>
<td>Unformatted <code>total-data-transferred</code> value.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>Amount of data read since the last sampling time.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>Unformatted <code>data-read</code> value.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>Amount of data written since the last sampling time.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>Unformatted <code>data-written</code> value.</td>
</tr>
<tr>
<td>total-iops</td>
<td>uint64</td>
<td>Total number of read and write operations per second since the last sampling time.</td>
</tr>
<tr>
<td>read-iops</td>
<td>uint64</td>
<td>Number of read operations per second since the last sampling time.</td>
</tr>
<tr>
<td>write-iops</td>
<td>uint64</td>
<td>Number of write operations per second since the last sampling time.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>total-bytes-per-sec</td>
<td>string</td>
<td>Total data transfer rate, in bytes per second, since the last sampling time.</td>
</tr>
<tr>
<td>total-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted total-bytes-per-second value.</td>
</tr>
<tr>
<td>read-bytes-per-sec</td>
<td>string</td>
<td>Data transfer rate, in bytes per second, for read operations since the last sampling time.</td>
</tr>
<tr>
<td>read-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted read-bytes-per-second value.</td>
</tr>
<tr>
<td>write-bytes-per-sec</td>
<td>string</td>
<td>Data transfer rate, in bytes per second, for write operations since the last sampling time.</td>
</tr>
<tr>
<td>write-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted write-bytes-per-second value.</td>
</tr>
<tr>
<td>queue-depth</td>
<td>uint64</td>
<td>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.</td>
</tr>
<tr>
<td>avg-rsp-time</td>
<td>uint64</td>
<td>Average response time, in microseconds, for read and write operations since the last sampling time.</td>
</tr>
<tr>
<td>avg-read-rsp-time</td>
<td>uint64</td>
<td>Average response time, in microseconds, for read operations since the last sampling time.</td>
</tr>
<tr>
<td>avg-write-rsp-time</td>
<td>uint64</td>
<td>Average response time, in microseconds, for write operations since the last sampling time.</td>
</tr>
<tr>
<td>avg-io-size</td>
<td>string</td>
<td>Average data size of read and write operations since the last sampling time.</td>
</tr>
<tr>
<td>avg-io-size-numeric</td>
<td>uint64</td>
<td>Unformatted avg-io-size value.</td>
</tr>
<tr>
<td>avg-read-io-size</td>
<td>string</td>
<td>Average data size of read operations since the last sampling time.</td>
</tr>
<tr>
<td>avg-read-io-size-numeric</td>
<td>uint64</td>
<td>Unformatted avg-read-io-size value.</td>
</tr>
<tr>
<td>avg-write-io-size</td>
<td>string</td>
<td>Average data size of write operations since the last sampling time.</td>
</tr>
<tr>
<td>avg-write-io-size-numeric</td>
<td>uint64</td>
<td>Unformatted avg-write-io-size value.</td>
</tr>
<tr>
<td>number-of-disk-errors</td>
<td>uint64</td>
<td>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</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>sample-time</td>
<td>string</td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds</code>, when the data sample was taken.</td>
</tr>
<tr>
<td>sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted <code>sample-time</code> value.</td>
</tr>
</tbody>
</table>

**disk-statistics**

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

**Table 32. disk-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Disk ID in the format <code>disk_enclosure-number.disk-number</code>.</td>
</tr>
<tr>
<td>location</td>
<td>string</td>
<td>The disk location in the format <code>disk_enclosure-number.disk-number</code>.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Disk serial number.</td>
</tr>
<tr>
<td>power-on-hours</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>bytes-per-second</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>bytes-per-second-numeric</td>
<td>uint64</td>
<td>Unformatted <code>bytes-per-second</code> value.</td>
</tr>
<tr>
<td>iops</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>Number of read operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>Number of write operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>Amount of data read since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>Unformatted data-read value.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>Amount of data written since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>Unformatted data-written value.</td>
</tr>
<tr>
<td>queue-depth</td>
<td>uint32</td>
<td>Number of pending I/O operations currently being serviced.</td>
</tr>
<tr>
<td>lifetime-data-read</td>
<td>string</td>
<td>The amount of data read from the disk in its lifetime.</td>
</tr>
<tr>
<td>lifetime-data-written</td>
<td>string</td>
<td>The amount of data written to the disk in its lifetime.</td>
</tr>
<tr>
<td>reset-time</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds, when these statistics were last reset, either by a user or by a controller restart.</td>
</tr>
<tr>
<td>reset-time-numeric</td>
<td>uint32</td>
<td>Unformatted reset-time value.</td>
</tr>
<tr>
<td>start-sample-time</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds, when sampling started for the iops and bytes-per-second values.</td>
</tr>
<tr>
<td>start-sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted start-sample-time value.</td>
</tr>
<tr>
<td>stop-sample-time</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds, when sampling stopped for the iops and bytes-per-second values.</td>
</tr>
<tr>
<td>stop-sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted stop-sample-time value.</td>
</tr>
<tr>
<td>smart-count-1</td>
<td>uint32</td>
<td>For port 1, the number of SMART events recorded.</td>
</tr>
<tr>
<td>io-timeout-count-1</td>
<td>uint32</td>
<td>For port 1, the number of timeouts accessing the disk.</td>
</tr>
<tr>
<td>no-response-count-1</td>
<td>uint32</td>
<td>For port 1, the number of times the disk did not respond.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>spinup-retry-count-1</td>
<td>uint32</td>
<td>For port 1, the number of attempts by the storage system to spin up the disk.</td>
</tr>
<tr>
<td>number-of-media-errors-1</td>
<td>uint32</td>
<td>For port 1, the number of media errors generated by the disk, as specified by its manufacturer.</td>
</tr>
<tr>
<td>number-of-nonmedia-errors-1</td>
<td>uint32</td>
<td>For port 1, the number of other errors generated by the storage system, or generated by the disk and not categorized as media errors.</td>
</tr>
<tr>
<td>number-of-block-reassigns-1</td>
<td>uint32</td>
<td>For port 1, the number of times blocks were reassigned to alternate locations.</td>
</tr>
<tr>
<td>number-of-bad-blocks-1</td>
<td>uint32</td>
<td>For port 1, the number of bad blocks encountered.</td>
</tr>
<tr>
<td>smart-count-2</td>
<td>uint32</td>
<td>For port 2, the number of pending I/O operations currently being serviced.</td>
</tr>
<tr>
<td>io-timeout-count-2</td>
<td>uint32</td>
<td>For port 2, the number of SMART events recorded.</td>
</tr>
<tr>
<td>no-response-count-2</td>
<td>uint32</td>
<td>For port 2, the number of timeouts accessing the disk.</td>
</tr>
<tr>
<td>spinup-retry-count-2</td>
<td>uint32</td>
<td>For port 2, the number of times the disk did not respond.</td>
</tr>
<tr>
<td>number-of-media-errors-2</td>
<td>uint32</td>
<td>For port 2, the number of attempts by the storage system to spin up the disk.</td>
</tr>
<tr>
<td>number-of-nonmedia-errors-2</td>
<td>uint32</td>
<td>For port 2, the number of media errors generated by the disk, as specified by its manufacturer.</td>
</tr>
<tr>
<td>number-of-block-reassigns-2</td>
<td>uint32</td>
<td>For port 2, the number of other errors generated by the storage system, or generated by the disk and not categorized as media errors.</td>
</tr>
<tr>
<td>number-of-bad-blocks-2</td>
<td>uint32</td>
<td>For port 2, the number of times blocks were reassigned to alternate locations.</td>
</tr>
</tbody>
</table>

**dns-parameters**

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

**Table 33. dns-parameters properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>controller</td>
<td>string</td>
<td>• A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• B: Controller B.</td>
</tr>
<tr>
<td>name-servers</td>
<td>string</td>
<td>Configured name server IP addresses.</td>
</tr>
<tr>
<td>search-domains</td>
<td>string</td>
<td>Configured domain names.</td>
</tr>
</tbody>
</table>
This basetype is used by `show enclosures`.

### Table 34. drawers properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Drawer ID.</td>
</tr>
<tr>
<td>drawer-id</td>
<td>uint8</td>
<td>• 0: Top • 1: Bottom</td>
</tr>
<tr>
<td>drawer-id (5U84 enclosure)</td>
<td>uint8</td>
<td>Not applicable (255).</td>
</tr>
<tr>
<td>drawer-wwn</td>
<td>string</td>
<td>Drawer WWN.</td>
</tr>
<tr>
<td>part-number</td>
<td>string</td>
<td>Drawer part number.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>Drawer name.</td>
</tr>
<tr>
<td>position</td>
<td>string</td>
<td>The drawer position in the enclosure, as viewed from the front.</td>
</tr>
<tr>
<td>rows</td>
<td>uint8</td>
<td>Number of rows of disk slots.</td>
</tr>
<tr>
<td>columns</td>
<td>uint8</td>
<td>Number of columns of disk slots.</td>
</tr>
<tr>
<td>slots</td>
<td>uint8</td>
<td>Number of disk slots in drawer.</td>
</tr>
<tr>
<td>number-of-disks</td>
<td>uint8</td>
<td>Number of disk slots (not installed disks) in drawer.</td>
</tr>
<tr>
<td>emp-a-busid</td>
<td>string</td>
<td>SCSI channel ID of the Enclosure Management Processor (EMP) A in a drawer’s Expander Controller.</td>
</tr>
<tr>
<td>emp-a-targetid</td>
<td>string</td>
<td>SCSI target ID of the Enclosure Management Processor (EMP) Sin a drawer’s Expander Controller.</td>
</tr>
<tr>
<td>emp-a-rev</td>
<td>string</td>
<td>Firmware revision for the Enclosure Management Processor (EMP) A in a drawer’s Expander Controller.</td>
</tr>
<tr>
<td>emp-b-busid</td>
<td>string</td>
<td>SCSI channel ID of the Enclosure Management Processor (EMP) B in a drawer’s Expander Controller.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>emp-b-targetid</td>
<td>string</td>
<td>SCSI target ID of the Enclosure Management Processor (EMP) B in a drawer's Expander Controller.</td>
</tr>
<tr>
<td>emp-b-rev</td>
<td>string</td>
<td>Firmware revision for the Enclosure Management Processor (EMP) B in a drawer's Expander Controller.</td>
</tr>
<tr>
<td>emp-a</td>
<td>string</td>
<td>Shows the field name EMP A in console format.</td>
</tr>
<tr>
<td>emp-a-ch-id-rev</td>
<td>string</td>
<td>Channel ID and firmware revision of the Enclosure Management Processor A in a drawer's Expander Controller.</td>
</tr>
<tr>
<td>emp-b</td>
<td>string</td>
<td>Shows the field name EMP B in console format.</td>
</tr>
<tr>
<td>emp-b-ch-id-rev</td>
<td>string</td>
<td>Channel ID and firmware revision of the Enclosure Management Processor B in a drawer's Expander Controller.</td>
</tr>
<tr>
<td>locator-led</td>
<td>string</td>
<td>Shows the state of the locator LED on a drawer:</td>
</tr>
<tr>
<td>locator-led-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for locator-led values.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Drawer status.</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td>extended-status</td>
<td>hex32</td>
<td>A numeric value that supplements the standard SES status shown by the status and status-numeric properties, and represents a specific condition.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| health             | string    | • OK  
• Degraded  
• Fault  
• N/A  
• Unknown                                                                                                                                 |
| health-numeric     | uint32    | Numeric equivalents for health values.  
• 0: OK  
• 1: Degraded  
• 2: Fault  
• 4: N/A |
| health-reason      | string    | If Health is not OK, the reason for the health state.                                                                                       |
| health-recommendation | string     | If Health is not OK, the recommended actions to take to resolve the health issue.                                                           |
| unhealthy component | Embedded; see unhealthy-component. |                                                                                                                                 |
| sideplane-details  | Embedded; see sideplanes. |                                                                                                                                 |

**drive-parameters**

This basetype is used by show disk-parameters.

**Table 35. drive-parameters properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>smart</td>
<td>string</td>
<td>Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks.</td>
</tr>
</tbody>
</table>
|                       |           | • Detect-Only: Each disk in the system retains its individual SMART setting, as will new disks added to the system.  
• Enabled: SMART is enabled for all disks in the system and will be enabled for new disks added to the system.  
• Disabled: SMART is disabled for all disks in the system and will be disabled for new disks added to the system. |
| smart-numeric         | uint32    | Numeric equivalents for smart values.  
• 0: Detect-Only  
• 1: Enabled  
• 2: Disabled |
| 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-summary

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

#### Table 36. drive-summary properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Disk ID in the format disk_enclosure-number.disk-number.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Disk serial number.</td>
</tr>
<tr>
<td>disk-hist-statistics</td>
<td>Embedded; see disk-hist-statistics.</td>
<td></td>
</tr>
</tbody>
</table>
This basetype is used by `show configuration` and `show disks`.

### Table 37. drives properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Disk ID in the format <code>disk_enclosure-ID.slot-number</code>.</td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>drawer-id (5U84 enclosure)</td>
<td>uint8</td>
<td>• 0: Top • 1: Bottom</td>
</tr>
<tr>
<td>drawer-id (2U12/24 enclosure)</td>
<td>uint8</td>
<td>Not applicable (255).</td>
</tr>
<tr>
<td>slot</td>
<td>uint32</td>
<td>Disk slot number.</td>
</tr>
<tr>
<td>location</td>
<td>string</td>
<td>Disk's enclosure ID and slot number.</td>
</tr>
<tr>
<td>url</td>
<td>string</td>
<td>Disk URL.</td>
</tr>
<tr>
<td>port</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>scsi-id</td>
<td>uint32</td>
<td>SCSI ID assigned to this disk for the primary channel.</td>
</tr>
<tr>
<td>blocksize</td>
<td>uint32</td>
<td>The size of a block, in bytes.</td>
</tr>
<tr>
<td>blocks</td>
<td>uint64</td>
<td>The number of blocks, whose size is specified by the <code>blocksize</code> property.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Disk serial number.</td>
</tr>
<tr>
<td>vendor</td>
<td>string</td>
<td>Disk vendor.</td>
</tr>
<tr>
<td>model</td>
<td>string</td>
<td>Disk model.</td>
</tr>
<tr>
<td>revision</td>
<td>string</td>
<td>Disk firmware revision level.</td>
</tr>
<tr>
<td>secondary-channel</td>
<td>uint32</td>
<td>SCSI ID assigned to this disk for the secondary channel.</td>
</tr>
<tr>
<td>container-index</td>
<td>uint32</td>
<td>Container index.</td>
</tr>
<tr>
<td>member-index</td>
<td>uint32</td>
<td>Index for this disk in the disk group list.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>Disk description.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SAS: Enterprise SAS spinning disk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SAS MDL: Midline SAS spinning disk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SSD SAS: SAS solid-state disk.</td>
</tr>
<tr>
<td>description-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for description values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: SAS</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>architecture</td>
<td>string</td>
<td>Disk architecture.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• HDD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SSD</td>
</tr>
<tr>
<td>architecture-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for architecture values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: SSD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: HDD</td>
</tr>
<tr>
<td>interface</td>
<td>string</td>
<td>Disk interface.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SAS</td>
</tr>
<tr>
<td>interface-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for interface values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: SAS</td>
</tr>
<tr>
<td>single-ported</td>
<td>string</td>
<td>• Disabled: The disk has a dual-port connection to the midplane.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The disk has a single-port connection to the midplane.</td>
</tr>
<tr>
<td>single-ported-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for single-ported values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>type</td>
<td>string</td>
<td>Type of disk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SAS: Enterprise SAS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SAS MDL: Midline SAS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• sSAS: SAS SSD.</td>
</tr>
<tr>
<td>type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: SAS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8: sSAS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 11: SAS MDL</td>
</tr>
<tr>
<td>usage</td>
<td>string</td>
<td>Shows the disk’s usage.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• AVAIL: The disk is available.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• DEDICATED SP: The disk is a spare assigned to a linear disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• GLOBAL SP: The disk is a global spare.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• LEFTOVR: The disk is a leftover.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• LINEAR POOL: The disk is a member of a linear disk group.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>UNUSABLE</strong>: The disk cannot be used in a disk group because the system is secured or the disk is locked to data access.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>VDISK</strong>: The disk is a member of a linear disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>VDISK SP</strong>: The disk is a spare assigned to a linear disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>VIRTUAL POOL</strong>: The disk is a member of a disk group in a virtual pool.</td>
</tr>
<tr>
<td>usage-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for usage values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: AVAIL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: VDISK or LINEAR POOL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: VDISK SP or DEDICATED SP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: GLOBAL SP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: LEFTOVR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7: FAILED</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8: UNUSABLE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 9: VIRTUAL POOL</td>
</tr>
<tr>
<td>smart-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for smart values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>dual-port</td>
<td>uint32</td>
<td>• 0: Single-ported disk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Dual-ported disk.</td>
</tr>
<tr>
<td>error</td>
<td>uint32</td>
<td>Not used.</td>
</tr>
<tr>
<td>fc-p1-channel</td>
<td>uint32</td>
<td>Port 1 channel ID.</td>
</tr>
<tr>
<td>fc-p1-device-id</td>
<td>uint32</td>
<td>Port 1 device ID.</td>
</tr>
<tr>
<td>fc-p1-node-wwn</td>
<td>string</td>
<td>Port 1 WWNN.</td>
</tr>
<tr>
<td>fc-p1-port-wwn</td>
<td>string</td>
<td>Port 1 WWPN.</td>
</tr>
<tr>
<td>fc-p1-unit-number</td>
<td>uint32</td>
<td>Port 1 unit number.</td>
</tr>
<tr>
<td>fc-p2-channel</td>
<td>uint32</td>
<td>Port 2 channel number.</td>
</tr>
<tr>
<td>fc-p2-device-id</td>
<td>uint32</td>
<td>Port 2 device ID.</td>
</tr>
<tr>
<td>fc-p2-node-wwn</td>
<td>string</td>
<td>Port 2 WWNN.</td>
</tr>
<tr>
<td>fc-p2-port-wwn</td>
<td>string</td>
<td>Port 2 WWPN.</td>
</tr>
<tr>
<td>fc-p2-unit-number</td>
<td>uint32</td>
<td>Port 2 unit number.</td>
</tr>
<tr>
<td>drive-down-code</td>
<td>uint8</td>
<td>Numeric code indicating why the disk is down.</td>
</tr>
<tr>
<td>owner</td>
<td>string</td>
<td>Current owner, which is either the preferred owner during normal operation or the partner controller when the preferred owner is offline.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for owner values.</td>
</tr>
<tr>
<td>index</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>rpm</td>
<td>uint32</td>
<td>The speed of a spinning disk, in thousands of revolutions per minute, as specified by the disk vendor. For an SSD, 0 is shown.</td>
</tr>
<tr>
<td>size</td>
<td>string</td>
<td>Disk capacity, formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>size-numeric</td>
<td>uint64</td>
<td>Unformatted size value in blocks.</td>
</tr>
<tr>
<td>sector-format</td>
<td>string</td>
<td>The disk sector format.</td>
</tr>
<tr>
<td>sector-format-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for sector-format values.</td>
</tr>
<tr>
<td>transfer-rate</td>
<td>string</td>
<td>Disk data transfer rate in Gbit/s. It is normal behavior for the rate to vary.</td>
</tr>
<tr>
<td>transfer-rate-numeric</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>attributes</td>
<td>string</td>
<td>Shows which controller a single-ported disk is connected to.</td>
</tr>
</tbody>
</table>

- A: Controller A.
- B: Controller B.
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>attributes-numeric</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>enclosure-wwn</td>
<td>string</td>
<td>Enclosure WWN.</td>
</tr>
<tr>
<td>enclosures-url</td>
<td>string</td>
<td>Enclosure URL.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Disk status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Up: The disk is present and is properly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>communicating with the expander.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Spun Down: The disk is present and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>has been spun down by the drive spin down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>feature.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warning: The disk is present but the system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>is having communication problems with the disk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LED processor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For disk and midplane types where this processor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>also controls power to the disk, power-on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>failure will result in Error status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Error: The disk is present but is not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>detected by the expander.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown: Initial status when the disk is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>first detected or powered on.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Present: The disk slot indicates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>that no disk is present.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unrecoverable: The disk is present but</td>
</tr>
<tr>
<td></td>
<td></td>
<td>has unrecoverable errors.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unavailable: The disk is present but</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cannot communicate with the expander.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unsupported: The disk is present but is an</td>
</tr>
<tr>
<td></td>
<td></td>
<td>unsupported type.</td>
</tr>
<tr>
<td>recon-state</td>
<td>string</td>
<td>The state of the disk (source or destination)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>if it is involved in a reconstruct operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• From: This disk is being used as the source of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a reconstruct operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• To: This disk is being used as the target of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a reconstruct operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A: This disk is not being used in a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reconstruct operation.</td>
</tr>
<tr>
<td>recon-state-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for recon-state values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: From</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: To</td>
</tr>
<tr>
<td>disk-dsd-count</td>
<td>uint32</td>
<td>Number of times the DSD feature has spun down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>this disk.</td>
</tr>
<tr>
<td>spun-down</td>
<td>uint32</td>
<td>Shows whether the disk is spun down by the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DSD feature.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Not spun down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Spun down.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>number-of-ios</td>
<td>uint64</td>
<td>Total number of I/O operations (reads and writes).</td>
</tr>
<tr>
<td>total-data- transferred</td>
<td>string</td>
<td>The total number of bytes transferred.</td>
</tr>
<tr>
<td>total-data- transferred- numeric</td>
<td>uint64</td>
<td>Unformatted total-data-transferred value.</td>
</tr>
<tr>
<td>avg-rsp-time</td>
<td>uint64</td>
<td>Average I/O response time in microseconds.</td>
</tr>
<tr>
<td>fde-state</td>
<td>string</td>
<td>The FDE state of the disk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown: The FDE state is unknown.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not FDE Capable: The disk is not FDE-capable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Secured: The disk is not secured.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Secured, Unlocked: The system is secured and the disk is unlocked.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Secured, Locked: The system is secured and the disk is locked to data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>access, preventing its use.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• FDE Protocol Failure: A temporary state that can occur while the system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>is securing the disk.</td>
</tr>
<tr>
<td>fde-state-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for fde-state values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Not FDE Capable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Not Secured</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Secured, Unlocked</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Secure, Locked</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: FDE Protocol Failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: Unknown</td>
</tr>
<tr>
<td>lock-key-id</td>
<td>string</td>
<td>Current lock ID, or 0000000000 if not set.</td>
</tr>
<tr>
<td>import-lock-key-id</td>
<td>string</td>
<td>Import lock ID, or 0000000000 if not set.</td>
</tr>
<tr>
<td>fde-config-time</td>
<td>string</td>
<td>If the system is secured, the time at which the current lock ID was set in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the format year-month-day hour:minutes:seconds (UTC).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Otherwise, N/A.</td>
</tr>
<tr>
<td>fde-config-time- numeric</td>
<td>uint32</td>
<td>Unformatted fde-config-time value.</td>
</tr>
<tr>
<td>temperature</td>
<td>string</td>
<td>Temperature of the disk.</td>
</tr>
<tr>
<td>temperature- numeric</td>
<td>uint32</td>
<td>Numeric equivalent for the temperature value.</td>
</tr>
<tr>
<td>temperature-status</td>
<td>string</td>
<td>• OK: The disk sensor is present and detects no error condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warning: The disk sensor detected a non-critical error condition.</td>
</tr>
</tbody>
</table>

332  API basetype properties
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>temperature- status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for temperature-status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Critical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• other: Unknown</td>
</tr>
<tr>
<td>power-on-hours</td>
<td>unit32</td>
<td>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.</td>
</tr>
<tr>
<td>extended-status</td>
<td>uint64</td>
<td>A numeric value that supplements the standard SES status shown by the status and status-numeric properties, and represents a specific condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000000: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000001: Single-pathed, A down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000002: SSD exhausted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000004: Degraded warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000008: Spun down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000010: Downed by user</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000020: Reconstruction failed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000040: Leftover, no reason</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000080: Previously missing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000100: Medium error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000200: SMART event</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000400: Hardware failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000800: Foreign disk unlocked</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00001000: Non-FDE disk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00002000: FDE protocol failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00004000: Using alternate path</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00008000: Initialization failed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00010000: Unsupported type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00040000: Recovered errors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00080000: Unexpected leftover</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x01000000: Not auto-secured</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x02000000: SSD nearly exhausted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x04000000: Degraded critical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x08000000: Single-pathed, B down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x10000000: Foreign disk secured</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x20000000: Foreign disk secured and locked</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x40000000: Unexpected usage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x80000000: Enclosure fault sensed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x10000000: Unsupported block size</td>
</tr>
</tbody>
</table>
### health
- **Type**: string
- **Description**: Disk health.
- **Values**:
  - OK
  - Degraded
  - Fault
  - Unknown
  - N/A

### health-numeric
- **Type**: uint32
- **Description**: Numeric equivalents for health values.
- **Values**:
  - 0: OK
  - 1: Degraded
  - 2: Fault
  - 3: Unknown
  - 4: N/A

### health-reason
- **Type**: string
- **Description**: If Health is not OK, the reason for the health state.

### health-recommendation
- **Type**: string
- **Description**: If Health is not OK, the recommended actions to take to resolve the health issue.

---

**email-parameters**

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

**Table 38. email-parameters properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>email-notification</td>
<td>string</td>
<td>Shows whether email (SMTP) notification of events is enabled.</td>
</tr>
<tr>
<td>email-notification-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for email-notification values.</td>
</tr>
<tr>
<td>email-notification-filter</td>
<td>string</td>
<td>The minimum severity for which the system should send notifications:</td>
</tr>
</tbody>
</table>

- **email-notification**
  - **Type**: string
  - **Description**: Shows whether email (SMTP) notification of events is enabled.
  - **Values**:
    - Disabled: Email notification is disabled.
    - Enabled: Email notification is enabled.

- **email-notification-numeric**
  - **Type**: uint32
  - **Description**: Numeric equivalents for email-notification values.
  - **Values**:
    - 0: Disabled
    - 1: Enabled

- **email-notification-filter**
  - **Type**: string
  - **Description**: 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.
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>resolved</td>
<td>string</td>
<td>Sends notifications for Resolved, Warning, Error, and Critical events.</td>
</tr>
<tr>
<td>info</td>
<td>string</td>
<td>Sends notifications for all events.</td>
</tr>
<tr>
<td>none</td>
<td>string</td>
<td>Disables email notification.</td>
</tr>
<tr>
<td>email-notification-filter</td>
<td>uint32</td>
<td>Numeric equivalents for email-notification-filter values.</td>
</tr>
<tr>
<td>0: info</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1: resolved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: warn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4: crit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5: none</td>
<td></td>
<td></td>
</tr>
<tr>
<td>email-notify-address-1</td>
<td>string</td>
<td>Up to three email addresses for recipients of event notifications.</td>
</tr>
<tr>
<td>email-notify-address-2</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>email-notify-address-3</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>email-notify-address-4</td>
<td>string</td>
<td>Shows the email address for the log-collection system used by the log-management feature.</td>
</tr>
<tr>
<td>email-security-protocol</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>TLS</td>
<td></td>
<td>Transport Layer Security (TLS) authentication is enabled.</td>
</tr>
<tr>
<td>SSL</td>
<td></td>
<td>Secure Sockets Layer (SSL) authentication is enabled.</td>
</tr>
<tr>
<td>None</td>
<td></td>
<td>No authentication is enabled.</td>
</tr>
<tr>
<td>email-security-protocol-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for email-security-protocol values.</td>
</tr>
<tr>
<td>0: None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1: TLS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: SSL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>email-smtp-port</td>
<td>string</td>
<td>The port on which the configured SMTP server is listening.</td>
</tr>
<tr>
<td>email-server</td>
<td>string</td>
<td>The IP address of the SMTP mail server to use for the email messages.</td>
</tr>
<tr>
<td>email-domain</td>
<td>string</td>
<td>The domain name that, with the sender name, forms the “from” address for remote notification.</td>
</tr>
<tr>
<td>email-sender</td>
<td>string</td>
<td>The sender name that, with the domain name, forms the “from” address for remote notification.</td>
</tr>
<tr>
<td>email-sender-password</td>
<td>string</td>
<td>The sender password.</td>
</tr>
</tbody>
</table>
### include-logs

**Description**
Shows whether system log files will automatically be attached for email notification messages generated by the log-management feature. This is the “push” mode of log management.

### include-logs-numeric

**Description**
Numeric equivalents for `include-logs` values.
- 0: Disabled
- 1: Enabled

### enclosure-fru

This basetype is used by show configuration and show frus.

**Table 39. enclosure-fru properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>FRU name.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>FRU long description.</td>
</tr>
<tr>
<td>part-number</td>
<td>string</td>
<td>FRU part number.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>FRU serial number.</td>
</tr>
<tr>
<td>revision</td>
<td>string</td>
<td>FRU hardware revision level.</td>
</tr>
<tr>
<td>dash-level</td>
<td>string</td>
<td>FRU template revision number.</td>
</tr>
<tr>
<td>fru-shortname</td>
<td>string</td>
<td>FRU short description.</td>
</tr>
<tr>
<td>mfg-date</td>
<td>string</td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds (UTC)</code>, when a PCBA was programmed or a power supply module was manufactured.</td>
</tr>
<tr>
<td>mfg-date-numeric</td>
<td>uint32</td>
<td>Unformatted <code>mfg-date</code> value.</td>
</tr>
<tr>
<td>mfg-location</td>
<td>string</td>
<td>City, state/province, and country where the FRU was manufactured.</td>
</tr>
<tr>
<td>mfg-vendor-id</td>
<td>string</td>
<td>JEDEC ID (global manufacturing code) of the FRU manufacturer.</td>
</tr>
<tr>
<td>fru-location</td>
<td>string</td>
<td>Location of the FRU in the enclosure.</td>
</tr>
</tbody>
</table>

336  API basetype properties
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>configuration- serialnumber</td>
<td>string</td>
<td>Configuration serial number.</td>
</tr>
</tbody>
</table>
| fru-status                | string         | • Absent: The FRU is not present.  
• Fault: The FRU's health is Degraded or Fault.  
• Invalid Data: The FRU ID data is invalid. The FRU's EEPROM is improperly programmed.  
• OK: The FRU is operating normally.  
• Power OFF: The FRU is powered off.                                                                 |
| fru-status-numeric        | uint32         | • 0: Invalid Data  
• 1: Fault  
• 2: Absent  
• 3: Power OFF  
• 4: OK  
• 5: N/A                                                                 |
| original- serialnumber    | string         | For a power supply module, the original manufacturer serial number. Otherwise, N/A.                                                        |
| original- partnumber      | string         | For a power supply module, the original manufacturer part number. Otherwise, N/A.                                                           |
| original-revision         | string         | For a power supply module, the original manufacturer hardware revision. Otherwise, N/A.                                                      |
| enclosure-id              | uint32         | Enclosure ID.                                                                                                                                |
## enclosure-list

This basetype is used by `show configuration`, and by `show disks` when the `encl` parameter is specified.

### Table 40. enclosure-list properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>string</td>
<td>Disk slot status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Up: The disk is present and is properly communicating with the expander.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Spun Down: The disk is present and has been spun down by the drive spin down feature.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Error: The disk is present but is not detected by the expander.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown: Initial status when the disk is first detected or powered on.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Present: The disk slot indicates that no disk is present.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unrecoverable: The disk is present but has unrecoverable errors.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unavailable: The disk is present but cannot communicate with the expander.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unsupported: The disk is present but is an unsupported type.</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Unsupported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Unrecoverable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: Not Present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7: Unavailable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 20: Spun Down</td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>slot</td>
<td>uint32</td>
<td>Disk slot number.</td>
</tr>
<tr>
<td>vendor</td>
<td>string</td>
<td>Disk vendor.</td>
</tr>
<tr>
<td>model</td>
<td>string</td>
<td>Disk model.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Disk serial number.</td>
</tr>
<tr>
<td>size</td>
<td>string</td>
<td>Disk capacity, formatted to use the current base, precision, and units.</td>
</tr>
</tbody>
</table>
### enclosures

This basetype is used by `show configuration` and `show enclosures`.

**Table 41. enclosure properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Enclosure ID in the format <code>enclosure_number</code></td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint8</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>enclosure-wwn</td>
<td>string</td>
<td>Enclosure WWN.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>Enclosure name.</td>
</tr>
<tr>
<td>type</td>
<td>string</td>
<td>Internal name for the enclosure type.</td>
</tr>
<tr>
<td>type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>type</code> values.</td>
</tr>
<tr>
<td>iom-type</td>
<td>string</td>
<td>I/O module type.</td>
</tr>
<tr>
<td>iom-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>iom-type</code> values.</td>
</tr>
<tr>
<td>platform-type</td>
<td>string</td>
<td>Hardware platform type.</td>
</tr>
<tr>
<td>platform-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>platform-type</code> values.</td>
</tr>
<tr>
<td>board-model</td>
<td>string</td>
<td>Board model.</td>
</tr>
<tr>
<td>board-model-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>board-model</code> values.</td>
</tr>
<tr>
<td>location</td>
<td>string</td>
<td>Enclosure location, or blank if not set.</td>
</tr>
<tr>
<td>rack-number</td>
<td>uint8</td>
<td>Number of the rack that contains the enclosure.</td>
</tr>
<tr>
<td>rack-position</td>
<td>uint8</td>
<td>Position of the enclosure in the rack.</td>
</tr>
<tr>
<td>number-of-coolings-elements</td>
<td>uint8</td>
<td>Number of fan units in the enclosure.</td>
</tr>
<tr>
<td>number-of-disks</td>
<td>uint8</td>
<td>Number of disk slots (not installed disks) in the enclosure.</td>
</tr>
<tr>
<td>number-of-power-supplies</td>
<td>uint8</td>
<td>Number of power supplies in the enclosure.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Enclosure status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unsupported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Critical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unrecoverable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unavailable</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>status</code> values.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>size-numeric</td>
<td>uint64</td>
<td>Unformatted size value in blocks.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>extended-status</td>
<td>hex32</td>
<td>A numeric value that supplements the standard SES status shown by the status and status-numeric properties, and represents a specific condition.</td>
</tr>
<tr>
<td>midplane-serial-number</td>
<td>string</td>
<td>Midplane serial number.</td>
</tr>
<tr>
<td>vendor</td>
<td>string</td>
<td>Enclosure vendor.</td>
</tr>
<tr>
<td>model</td>
<td>string</td>
<td>Enclosure model.</td>
</tr>
<tr>
<td>fru-shorthand</td>
<td>string</td>
<td>FRU short description.</td>
</tr>
<tr>
<td>fru-location</td>
<td>string</td>
<td>FRU location.</td>
</tr>
<tr>
<td>part-number</td>
<td>string</td>
<td>FRU part number.</td>
</tr>
<tr>
<td>mfg-date</td>
<td>string</td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds(UTC)</code>, when a PCBA was programmed or a power supply module was manufactured.</td>
</tr>
<tr>
<td>mfg-date-numeric</td>
<td>uint32</td>
<td>Unformatted mfg-date value.</td>
</tr>
<tr>
<td>mfg-location</td>
<td>string</td>
<td>City, state/province, and country where the FRU was manufactured.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>FRU long description.</td>
</tr>
<tr>
<td>revision</td>
<td>string</td>
<td>Hardware revision level for the FRU.</td>
</tr>
<tr>
<td>dash-level</td>
<td>string</td>
<td>FRU template revision number.</td>
</tr>
<tr>
<td>emp-a-rev</td>
<td>string</td>
<td>Firmware revision of controller A’s EMP.</td>
</tr>
<tr>
<td>emp-b-rev</td>
<td>string</td>
<td>Firmware revision of controller B’s EMP.</td>
</tr>
<tr>
<td>rows</td>
<td>uint8</td>
<td>Number of rows of disk slots.</td>
</tr>
<tr>
<td>columns</td>
<td>uint8</td>
<td>Number of columns of disk slots.</td>
</tr>
<tr>
<td>slots</td>
<td>uint8</td>
<td>Number of disk slots in this enclosure</td>
</tr>
<tr>
<td>locator-led</td>
<td>string</td>
<td>Shows the state of the locator LED on an enclosure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>locator-led- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for locator-led values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>drive-orientation</td>
<td>string</td>
<td>• vertical: Disks are oriented vertically.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• horizontal: Disks are oriented horizontally.</td>
</tr>
<tr>
<td>drive-orientation- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for drive-orientation values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: vertical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: horizontal</td>
</tr>
<tr>
<td>enclosure-arrangement</td>
<td>string</td>
<td>• vertical: Disks are numbered vertically (by column from top to bottom,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>proceeding from left to right).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• horizontal: Disks are numbered horizontally (by row from left to right,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>proceeding from top to bottom).</td>
</tr>
<tr>
<td>enclosure-arrangement-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for enclosure-arrangement values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: vertical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: horizontal</td>
</tr>
<tr>
<td>emp-a-busid</td>
<td>string</td>
<td>SCSI channel ID of controller A EMP.</td>
</tr>
<tr>
<td>emp-a-targetid</td>
<td>string</td>
<td>SCSI target ID of controller A EMP.</td>
</tr>
<tr>
<td>emp-b-busid</td>
<td>string</td>
<td>SCSI channel ID of controller B EMP.</td>
</tr>
<tr>
<td>emp-b-targetid</td>
<td>string</td>
<td>SCSI target ID of controller B EMP.</td>
</tr>
<tr>
<td>emp-a</td>
<td>string</td>
<td>Shows the field name EMP A in console format.</td>
</tr>
<tr>
<td>emp-a-ch-id-rev</td>
<td>string</td>
<td>SCSI address and firmware revision of controller A EMP.</td>
</tr>
<tr>
<td>emp-b</td>
<td>string</td>
<td>Shows the field name EMP B in console format.</td>
</tr>
<tr>
<td>emp-b-ch-id-rev</td>
<td>string</td>
<td>SCSI address and firmware revision of controller B EMP.</td>
</tr>
<tr>
<td>midplane-type</td>
<td>string</td>
<td>An abbreviation that describes the enclosure midplane's rack-unit height,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>maximum number of disks, maximum data rate to disks (Gbit/s), and hardware</td>
</tr>
<tr>
<td></td>
<td></td>
<td>version.</td>
</tr>
<tr>
<td>midplane-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for midplane-type values.</td>
</tr>
<tr>
<td>midplane-rev</td>
<td>uint8</td>
<td>Midplane revision number.</td>
</tr>
<tr>
<td>enclosure-power</td>
<td>string</td>
<td>Enclosure power in watts.</td>
</tr>
<tr>
<td>pcie2-capable</td>
<td>string</td>
<td>• False: Enclosure is not capable of using PCI Express version 2.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• True: Enclosure is capable of using PCI Express version 2.</td>
</tr>
<tr>
<td>pcie2-capable-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for pcie2-capable values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: False</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: True</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Degraded</td>
</tr>
</tbody>
</table>
### events

This basetype is used by `show events`.

**Table 42. event properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>time-stamp</td>
<td>string</td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds</code> (UTC), when this event was detected.</td>
</tr>
<tr>
<td>time-stamp-numeric</td>
<td>uint32</td>
<td>Unformatted time-stamp value.</td>
</tr>
<tr>
<td>event-code</td>
<td>string</td>
<td>Event code.</td>
</tr>
<tr>
<td>event-id</td>
<td>string</td>
<td>Event ID.</td>
</tr>
<tr>
<td>model</td>
<td>string</td>
<td>Controller model.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Controller serial number.</td>
</tr>
</tbody>
</table>
| controller            | string    | • A: Controller A.  
• B: Controller B. |
| controller-numeric    | uint32    | Numeric equivalents for `controller` values.                               |

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>health</code> values.</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended actions to take to resolve the health issue.</td>
</tr>
<tr>
<td>unhealthy-component</td>
<td>Embedded;</td>
<td>Contains information about the unhealthy component.</td>
</tr>
<tr>
<td>drawer</td>
<td>Embedded;</td>
<td>Includes details of the drawer.</td>
</tr>
<tr>
<td>controllers</td>
<td>Embedded;</td>
<td>Includes details of the controllers.</td>
</tr>
<tr>
<td>power-supplies</td>
<td>Embedded;</td>
<td>Includes details of the power supplies.</td>
</tr>
<tr>
<td>fan-modules</td>
<td>Embedded;</td>
<td>Includes details of the fan modules.</td>
</tr>
<tr>
<td>fan-details</td>
<td>Embedded;</td>
<td>This includes details of the fan.</td>
</tr>
</tbody>
</table>

---

API basetype properties
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>severity</td>
<td>string</td>
<td>Event severity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- CRITICAL: A failure occurred that may cause a controller to shut down. Correct the problem immediately.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- ERROR: A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- WARNING: A problem occurred that may affect system stability but not data integrity. Evaluate the problem and correct it if necessary.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- INFORMATIONAL: A configuration or state change occurred, or a problem occurred that the system corrected. No action is required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- RESOLVED: A condition that caused an event to be logged has been resolved.</td>
</tr>
<tr>
<td>severity-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for severity values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: INFORMATIONAL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: WARNING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: CRITICAL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 4: RESOLVED</td>
</tr>
<tr>
<td>message</td>
<td>string</td>
<td>Brief description of the event that occurred. For some events, the message includes data about affected components.</td>
</tr>
<tr>
<td>additional-information</td>
<td>string</td>
<td>Shows additional information, if available, about the event.</td>
</tr>
<tr>
<td>recommended-action</td>
<td>string</td>
<td>Recommends actions to take, if any, to resolve the issue reported by the event.</td>
</tr>
</tbody>
</table>

### eventsLogs

This basetype is used by show events when the logs parameter is specified.

#### Table 43. eventsLogs properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>event-id</td>
<td>string</td>
<td>Event ID prefaced by A or B to identify the controller that logged the event.</td>
</tr>
<tr>
<td>time-stamp</td>
<td>string</td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds</code> (UTC), when this event was detected.</td>
</tr>
<tr>
<td>time-stamp-numeric</td>
<td>string</td>
<td>Unformatted time-stamp value.</td>
</tr>
<tr>
<td>event-code</td>
<td>string</td>
<td>Event code identifying the type of event to help diagnose problems.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>severity</td>
<td>string</td>
<td>Event severity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>CRITICAL</strong>: A failure occurred that may cause a controller to shut down. Correct the problem immediately.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>ERROR</strong>: A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>WARNING</strong>: A problem occurred that may affect system stability but not data integrity. Evaluate the problem and correct it if necessary.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>INFORMATIONAL</strong>: A configuration or state change occurred, or a problem occurred that the system corrected. No action is required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>RESOLVED</strong>: A condition that caused an event to be logged has been resolved.</td>
</tr>
<tr>
<td>severity-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for severity values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: INFORMATIONAL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: WARNING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: CRITICAL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 4: RESOLVED</td>
</tr>
<tr>
<td>message</td>
<td>string</td>
<td>Message giving details about the event.</td>
</tr>
</tbody>
</table>

### expander-ports

This basetype is used by `show sas-link-health`.

#### Table 44. expander-ports properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Expander port ID.</td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>controller</td>
<td>string</td>
<td>- A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- B: Controller B.</td>
</tr>
<tr>
<td>controller-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: A</td>
</tr>
<tr>
<td>sas-port-type</td>
<td>string</td>
<td>- Drawer Port Egress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Drawer Port Ingress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Expansion Port Egress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Expansion Port Ingress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Expansion Port Universal</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>sas-port-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for sas-port-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Drawer Port Egress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Drawer Port Ingress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Expansion Port Egress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Expansion Port Ingress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: Expansion Port Universal</td>
</tr>
<tr>
<td>sas-port-index</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>• Out Port: Egress (expansion) port on controller module or an expansion module. Can be connected to an ingress port in an expansion module.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• In Port: Ingress port on an expansion module. Can be connected to an egress (expansion) port in a controller module or an expansion module.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Universal Port: Port that can function as either an egress or ingress port in a controller module or an expansion module.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Expander port status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Up: The port is cabled and has an I/O link.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warning: Not all of the port’s PHYs are up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Error: The port is reporting an error condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Present: The controller module is not installed or is down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disconnected: Either no I/O link is detected or the port is not cabled.</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Not Present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: Disconnected</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
</tbody>
</table>

API basetype properties 345
### health-reason

If Health is not OK, the reason for the health state.

### health-recommendation

If Health is not OK, the recommended actions to take to resolve the health issue.

---

**expander-versions**

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

**Table 45. expander-versions properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>Expansion IOM name in the format IOM enclosure-ID, position.</td>
</tr>
<tr>
<td>location</td>
<td>string</td>
<td>Expander location in the format Enclosure enclosure-ID, lom I/O-module- ID.</td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>drawer-id</td>
<td>uint8</td>
<td>• 0: Top&lt;br&gt;• 1: Bottom</td>
</tr>
<tr>
<td>expander-id</td>
<td>uint8</td>
<td>Expander ID.</td>
</tr>
<tr>
<td>controller</td>
<td>string</td>
<td>• A: Controller A.&lt;br&gt;• B: Controller B.</td>
</tr>
<tr>
<td>controller-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller values.&lt;br&gt;• 0: B&lt;br&gt;• 1: A</td>
</tr>
<tr>
<td>fw-revision</td>
<td>string</td>
<td>IOM firmware version, short form.</td>
</tr>
<tr>
<td>fw-revision-full</td>
<td>string</td>
<td>IOM firmware version, long form.</td>
</tr>
<tr>
<td>vpd-format-version</td>
<td>string</td>
<td>Vital Product Data (VPD) version.</td>
</tr>
<tr>
<td>vpd-crc</td>
<td>string</td>
<td>VPD CRC.</td>
</tr>
<tr>
<td>cfg-format-version</td>
<td>string</td>
<td>Configuration format version.</td>
</tr>
<tr>
<td>cfg-crc</td>
<td>string</td>
<td>CFG CRC.</td>
</tr>
<tr>
<td>bootloader-version</td>
<td>string</td>
<td>Boot loader version.</td>
</tr>
</tbody>
</table>
### expanders

This basetype is used by `show enclosures`.

**Table 46. expanders properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cpld-version</td>
<td>string</td>
<td>Complex Programmable Logic Device (CPLD) firmware version</td>
</tr>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Expander ID.</td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>drawer-id (5U84 enclosure)</td>
<td>uint8</td>
<td>• 0: Top&lt;br&gt;• 1: Bottom</td>
</tr>
<tr>
<td>drawer-id (2U12/24 enclosure)</td>
<td>uint8</td>
<td>Not applicable (255).</td>
</tr>
<tr>
<td>dom-id</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>path-id</td>
<td>string</td>
<td>• A: Controller A.&lt;br&gt;• B: Controller B.</td>
</tr>
<tr>
<td>path-id-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>path-id</code> values.&lt;br&gt;• 0: B&lt;br&gt;• 1: A</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>Expander name.</td>
</tr>
<tr>
<td>location</td>
<td>string</td>
<td>Expander location.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Expander status.&lt;br&gt;• Unsupported&lt;br&gt;• OK&lt;br&gt;• Critical&lt;br&gt;• Warning&lt;br&gt;• Unrecoverable&lt;br&gt;• Not Installed&lt;br&gt;• Unknown&lt;br&gt;• Unavailable</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>status</code> values.&lt;br&gt;• 0: Unsupported&lt;br&gt;• 1: OK&lt;br&gt;• 2: Critical&lt;br&gt;• 3: Warning&lt;br&gt;• 4: Unrecoverable</td>
</tr>
</tbody>
</table>
### Table 47. fan properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Fan ID.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>Fan name.</td>
</tr>
<tr>
<td>location</td>
<td>string</td>
<td>Fan location.</td>
</tr>
</tbody>
</table>
| status-ses       | string    | Fan status.  
  - Unsupported  
  - OK  
  - Critical  
  - Warning  
  - Unrecoverable  
  - Not Installed  
  - Unknown  
  - Unavailable |

**fan**

This basetype is used by `show fans` and `show power-supplies`.

### Table 47. fan properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>string</td>
<td>Fan ID.</td>
</tr>
<tr>
<td>Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• 5: Not Installed  
• 6: Unknown  
• 7: Unavailable

**extended-status**

hex32  
Always 0 for this component.

**fw-revision**

string  
Expander firmware revision.

**health**

string  
- OK  
- Degraded  
- Fault  
- N/A  
- Unknown

**health-numeric**

uint32  
Numeric equivalents for health values.  
- 0: OK  
- 1: Degraded  
- 2: Fault  
- 3: N/A  
- 4: Unknown

**health-reason**

string  
If Health is not OK, the reason for the health state.

**health-recommendation**

string  
If Health is not OK, the recommended action to take to resolve the health issue.

**unhealthy-component**

Embedded; see unhealthy-component.

**sas-port-details**

Embedded; see expander-ports.
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>status-ses-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>status-ses</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Unsupported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: Critical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 4: Unrecoverable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 5: Not Installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 6: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 7: Unavailable</td>
</tr>
<tr>
<td>extended-status</td>
<td>hex32</td>
<td>A numeric value that provides additional information to supplement the standard SES status shown by the <code>status</code> and <code>status-numeric</code> properties. The <code>extended-status</code> value is a bitwise value computed from the values of five status bits, and may be one of the following values or a combination of these values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: The device has reported a failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: The device is off.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 4: The device FRU is not installed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 8: The device status cannot be determined.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 16: The device is requested to be on (not off). This is the default status and represents normal operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 17: Device has failed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 18: Device is off.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 19: Device has failed and is off.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 24: Device status is unknown, which could represent an I2C communication issue.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Fan unit status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Missing</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>status</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: Missing</td>
</tr>
<tr>
<td>speed</td>
<td>uint32</td>
<td>Fan speed (revolutions per minute).</td>
</tr>
<tr>
<td>position</td>
<td>string</td>
<td>Fan position, as viewed from the back of the enclosure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Left</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Right</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- N/A</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>position-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for position values.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>(blank): Not applicable.</td>
</tr>
<tr>
<td>part-number</td>
<td>string</td>
<td>(blank): Not applicable.</td>
</tr>
<tr>
<td>fw-revision</td>
<td>string</td>
<td>(blank): Not applicable. Firmware revision of a fan FRU.</td>
</tr>
<tr>
<td>hw-revision</td>
<td>string</td>
<td>(blank): Not applicable.</td>
</tr>
<tr>
<td>locator-led</td>
<td>string</td>
<td>Shows the state of the locator LED on a fan unit.</td>
</tr>
<tr>
<td>locator-led-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for locator-led values.</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>OK, Degraded, Fault, N/A, Unknown.</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended actions to take to resolve the health issue.</td>
</tr>
</tbody>
</table>

**fan-module-versions**

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

**Table 48. fan-module-versions properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>Fan name in the format <code>fan_enclosure-ID.fan-number</code>.</td>
</tr>
</tbody>
</table>
### Table 49. fan-modules properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Fan module ID.</td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>dom-id</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>Fan module name.</td>
</tr>
<tr>
<td>location</td>
<td>string</td>
<td>Fan module location.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Fan module status.</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
</tbody>
</table>

- **Unsupported**
- **OK**
- **Critical**
- **Warning**
- **Unrecoverable**
- **Not Installed**
- **Unknown**
- **Unavailable**
### Table 50. fc-ports properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>configured- topology</td>
<td>string</td>
<td>Configured topology.</td>
</tr>
<tr>
<td>configured- topology-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for configured-topology values.</td>
</tr>
</tbody>
</table>

### fc-ports

This basetype is used by show ports for a Fibre Channel port.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>configured- topology</td>
<td>string</td>
<td>Configured topology.</td>
</tr>
<tr>
<td>configured- topology-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for configured-topology values.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>primary-loop-id</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>sfp-status</td>
<td>string</td>
<td>SFP status.</td>
</tr>
<tr>
<td>sfp-status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for sfp-status values.</td>
</tr>
<tr>
<td>sfp-present</td>
<td>string</td>
<td>Shows whether the port contains an SFP.</td>
</tr>
<tr>
<td>sfp-present-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for sfp-present values.</td>
</tr>
<tr>
<td>sfp-vendor</td>
<td>string</td>
<td>The SFP vendor.</td>
</tr>
<tr>
<td>sfp-part-number</td>
<td>string</td>
<td>The SFP part number.</td>
</tr>
<tr>
<td>sfp-revision</td>
<td>string</td>
<td>The SFP revision.</td>
</tr>
<tr>
<td>sfp-supported-speeds</td>
<td>string</td>
<td>The link speeds that the SFP supports.</td>
</tr>
<tr>
<td>sfp-supported-speeds-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for sfp-supported-speeds values.</td>
</tr>
</tbody>
</table>
**fde-state**

This basetype is used by `show fde-state`.

**Table 51. fde-state properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>fde-security-status</td>
<td>string</td>
<td>Shows whether the system is secured or unsecured:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unsecured: The system has not been secured with a passphrase.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Secured, Lock Ready: The system has been secured and lock keys have been cleared. The system will become locked after the next power cycle.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Secured, Locked: The system is secured and the disks are locked to data access, preventing their use.</td>
</tr>
<tr>
<td>fde-security-status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for fde-security-status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Unsecured</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Secured</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Secured, Lock Ready</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Secured, Locked</td>
</tr>
<tr>
<td>lock-key-id</td>
<td>string</td>
<td>Current lock ID.</td>
</tr>
<tr>
<td>import-lock-key-id</td>
<td>string</td>
<td>The previous or import lock ID.</td>
</tr>
<tr>
<td>fde-config-time</td>
<td>string</td>
<td>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 (UTC)</code>.</td>
</tr>
<tr>
<td>fde-config-time-numeric</td>
<td>uint32</td>
<td>Unformatted fde-config-time value.</td>
</tr>
</tbody>
</table>

**fenced-data**

This basetype is used by `show fenced-data`.

**Table 52. fenced-data properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>volume</td>
<td>string</td>
<td>The volume name for which fenced data is reported.</td>
</tr>
<tr>
<td>volume-serial</td>
<td>string</td>
<td>The volume serial number for which fenced data is reported.</td>
</tr>
<tr>
<td>volume-lba</td>
<td>string</td>
<td>The LBA in the volume at which fenced data is reported.</td>
</tr>
<tr>
<td>virtual-disk</td>
<td>string</td>
<td>The name of the disk group for which fenced data is reported.</td>
</tr>
</tbody>
</table>
### virtual-disk-

**Name** | **Type** | **Description**
---|---|---
virtual-disk-serial | string | The serial number of the disk group for which fenced data is reported.
virtual-disk-lba | string | The LBA in the disk group at which fenced data is reported.

### fru-versions

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

**Table 53. fru-versions properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>The enclosure ID.</td>
</tr>
<tr>
<td>midplane-versions</td>
<td>Embedded; see midplane-versions.</td>
<td></td>
</tr>
<tr>
<td>expander-versions</td>
<td>Embedded; see expander-versions.</td>
<td></td>
</tr>
<tr>
<td>fan-module-versions</td>
<td>Embedded; see fan-module-versions</td>
<td></td>
</tr>
<tr>
<td>psu-versions</td>
<td>Embedded; see psu-versions.</td>
<td></td>
</tr>
</tbody>
</table>

### host

This basetype is used by `show host-groups`.

**Table 54. host properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Host ID.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the host.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the host.</td>
</tr>
<tr>
<td>member-count</td>
<td>uint32</td>
<td>The number of initiators in the host.</td>
</tr>
<tr>
<td>host-group</td>
<td>uint32</td>
<td>If the host is a member of a host group, the serial number of the host group. Otherwise, UNGROUPEDHOSTS.</td>
</tr>
<tr>
<td>group-key</td>
<td>string</td>
<td>If the host is a member of a host group, the durable ID of the host group. Otherwise, HGU.</td>
</tr>
<tr>
<td>initiator</td>
<td>Embedded; see initiator.</td>
<td></td>
</tr>
</tbody>
</table>
**host-group**

This basetype is used by `show host-groups`.

**Table 55. host-group properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Host group ID.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the host group.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the host group.</td>
</tr>
<tr>
<td>member-count</td>
<td>uint32</td>
<td>The number of hosts in the host group.</td>
</tr>
<tr>
<td>host</td>
<td></td>
<td>Embedded; see host.</td>
</tr>
</tbody>
</table>

**host-group-view**

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

**Table 56. host-group-view properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Host group ID.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the host group.</td>
</tr>
<tr>
<td>group-name</td>
<td>string</td>
<td>The name of the host group in the format <code>host-group.*.*</code>, where the first * represents all hosts in the group and the second * represents all initiators in those hosts.</td>
</tr>
<tr>
<td>ini-view-mappings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ini-view-initiators</td>
<td>Embedded; see initiator-view</td>
<td></td>
</tr>
</tbody>
</table>

**host-port-statistics**

This basetype is used by `show host-port-statistics`.

**Table 57. host-port-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Host port ID in the format <code>hostport_controller-ID-and-port-number</code>.</td>
</tr>
<tr>
<td>bytes-per-second</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>bytes-per-second-numeric</td>
<td>uint64</td>
<td>Unformatted bytes-per-second value.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>iops</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>Number of read operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>Number of write operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>Amount of data read since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>Unformatted data-read value.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>Amount of data written since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>Unformatted data-written value.</td>
</tr>
<tr>
<td>queue-depth</td>
<td>uint32</td>
<td>The number of pending I/O operations currently being serviced.</td>
</tr>
<tr>
<td>avg-rsp-time</td>
<td>uint32</td>
<td>Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.</td>
</tr>
<tr>
<td>avg-read-rsp-time</td>
<td>uint32</td>
<td>Average response time, in microseconds, for all read operations, calculated over the interval since these statistics were last requested or reset.</td>
</tr>
<tr>
<td>avg-write-rsp-time</td>
<td>uint32</td>
<td>Average response time, in microseconds, for all write operations, calculated over the interval since these statistics were last requested or reset.</td>
</tr>
<tr>
<td>reset-time</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>reset-time-numeric</td>
<td>uint32</td>
<td>Unformatted reset-time value.</td>
</tr>
<tr>
<td>start-sample-time</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>start-sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted start-sample-time value.</td>
</tr>
</tbody>
</table>
### host-view-mappings

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

#### Table 58. host-view-mappings properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>volume-name</td>
<td>string</td>
<td>Volume name.</td>
</tr>
<tr>
<td>volume-serial</td>
<td>string</td>
<td>Volume serial number.</td>
</tr>
<tr>
<td>lun</td>
<td>string</td>
<td>LUN assigned to the mapping.</td>
</tr>
<tr>
<td>access</td>
<td>string</td>
<td>Type of host access to the volume.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• read-write: Read and write</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• read-only: Read only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no-access: No access (masked)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• not-mapped: Not mapped</td>
</tr>
<tr>
<td>access-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of access values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: not-mapped</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: no-access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: read-only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: read-write</td>
</tr>
<tr>
<td>ports</td>
<td>string</td>
<td>Controller host ports assigned to the mapping.</td>
</tr>
</tbody>
</table>

### initiator

This basetype is used by `show initiators`.

#### Table 59. initiator properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Initiator ID.</td>
</tr>
<tr>
<td>nickname</td>
<td>string</td>
<td>The nickname of the initiator, or blank.</td>
</tr>
</tbody>
</table>
| discovered| string  | • Yes: The initiator was discovered and its entry was automatically created.
<p>|           |         | • No: The initiator was manually created.                                   |
| mapped    | string  | • Yes: At least one volume is explicitly mapped to the initiator.           |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>string</td>
<td>No: No volumes are explicitly mapped to the initiator.</td>
</tr>
<tr>
<td>Standard</td>
<td>string</td>
<td>Standard: Default profile.</td>
</tr>
<tr>
<td>profile-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of profile values.</td>
</tr>
</tbody>
</table>
| host-bus-type      | string     | • If the host was discovered and its entry was automatically created, its host interface type: FC; iSCSI; SAS.  
|                    |            | • If the host entry was manually created: Undefined.                        |
| host-bus-type-numeric | uint32   | Numeric equivalents of host-bus-type values.                                 |
| id                 | string     | • For an FC initiator, its WWPN.                                            |
|                    |            | • For a SAS initiator, its WWPN.                                            |
|                    |            | • For an iSCSI initiator, its node name (typically the IQN).                 |
| host-id            | string     | If the initiator is a member of a host, the serial number of the host.      |
|                    |            | Otherwise, NOHOST.                                                          |
| host-key           | string     | If the initiator is a member of a host, the durable ID of the host.          |
|                    |            | Otherwise, HU.                                                              |
| host-port-bits-a   | uint32     | For internal use only.                                                      |
| host-port-bits-b   | uint32     | For internal use only.                                                      |

**initiator-view**

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

**Table 60. initiator-view properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>string</td>
<td>• For an FC initiator, its WWPN.</td>
</tr>
<tr>
<td>hba-nickname</td>
<td>string</td>
<td>The nickname of the initiator.</td>
</tr>
<tr>
<td>host-profile</td>
<td>string</td>
<td>Standard: Default profile.</td>
</tr>
<tr>
<td>host-profile-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of host-profile values.</td>
</tr>
</tbody>
</table>
0: Standard

host-view-mappings  Embedded; see host-view-mappings.

**inquiry**

This basetype is used by show inquiry.

**Table 61. inquiry properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mc-fw</td>
<td>string</td>
<td>Management Controller firmware version.</td>
</tr>
<tr>
<td>mc-loader</td>
<td>string</td>
<td>Management Controller loader firmware version.</td>
</tr>
<tr>
<td>sc-fw</td>
<td>string</td>
<td>Storage Controller firmware version.</td>
</tr>
<tr>
<td>sc-loader</td>
<td>string</td>
<td>Storage Controller loader firmware version.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Controller serial number.</td>
</tr>
<tr>
<td>mac-address</td>
<td>string</td>
<td>Controller network port MAC address.</td>
</tr>
<tr>
<td>ip-address</td>
<td>string</td>
<td>Controller network port IP address.</td>
</tr>
<tr>
<td>ip6-link-local-address</td>
<td>string</td>
<td>The link-local IPv6 address.</td>
</tr>
<tr>
<td>ip6-auto-source-address</td>
<td>string</td>
<td>The automatically configured IPv6 address, when applicable.</td>
</tr>
<tr>
<td>ip6-auto-address-source-numeric</td>
<td>uint32</td>
<td>The method used to assign or compute the automatic address:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: DHCPv6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: IPv6 SLAAK</td>
</tr>
<tr>
<td>ip61-address</td>
<td>string</td>
<td>First IPv6 address for the controller management port, if set.</td>
</tr>
<tr>
<td>ip62-address</td>
<td>string</td>
<td>Second IPv6 address for the controller management port, if set.</td>
</tr>
<tr>
<td>ip63-address</td>
<td>string</td>
<td>Third IPv6 address for the controller management port, if set.</td>
</tr>
<tr>
<td>ip64-address</td>
<td>string</td>
<td>Fourth IPv6 address for the controller management port, if set.</td>
</tr>
<tr>
<td>nvram-defaults</td>
<td>string</td>
<td>For internal use only.</td>
</tr>
</tbody>
</table>
**io-modules**

This basetype is used by show enclosures for an expansion module.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Expansion module ID.</td>
</tr>
<tr>
<td>controller-id</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• B: Controller B.</td>
</tr>
<tr>
<td>controller-id- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller-id values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: A</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>FRU name.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>FRU long description.</td>
</tr>
<tr>
<td>part-number</td>
<td>string</td>
<td>FRU part number.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>FRU serial number.</td>
</tr>
<tr>
<td>revision</td>
<td>string</td>
<td>FRU hardware revision level.</td>
</tr>
<tr>
<td>dash-level</td>
<td>string</td>
<td>FRU template revision number.</td>
</tr>
<tr>
<td>fru-shortname</td>
<td>string</td>
<td>FRU short description.</td>
</tr>
<tr>
<td>mfg-date</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(UTC), when the controller's PCBA was programmed or a power</td>
</tr>
<tr>
<td></td>
<td></td>
<td>supply module was manufactured.</td>
</tr>
<tr>
<td>mfg-date-numeric</td>
<td>uint32</td>
<td>Unformatted mfg-date value.</td>
</tr>
<tr>
<td>mfg-location</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>City, state/province, and country where the FRU was manufactured.</td>
</tr>
<tr>
<td>mfg-vendor-id</td>
<td>string</td>
<td>JEDEC ID of the FRU manufacturer.</td>
</tr>
<tr>
<td>position</td>
<td>string</td>
<td>FRU position, as viewed from the back of the enclosure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Left</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Right</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Top</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bottom</td>
</tr>
<tr>
<td>position-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for position values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Left</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Right</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Top</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Bottom</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>rotation</td>
<td>string</td>
<td>Rotation of the controller module in the enclosure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0 Degrees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 90 Degrees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 180 Degrees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 270 Degrees</td>
</tr>
<tr>
<td>rotation-numeric</td>
<td>string</td>
<td>Numeric equivalents for position values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: 0 Degrees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: 90 Degrees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: 180 Degrees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: 270 Degrees</td>
</tr>
<tr>
<td>configuration- serialnumber</td>
<td>string</td>
<td>Configuration serial number.</td>
</tr>
<tr>
<td>phy-isolation</td>
<td>string</td>
<td>Shows whether the automatic disabling of SAS expander PHYs having high error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>counts is enabled or disabled for this controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: PHY fault isolation is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: PHY fault isolation is disabled.</td>
</tr>
<tr>
<td>phy-isolation- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for phy-isolation values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Enabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Disabled</td>
</tr>
<tr>
<td>locator-led</td>
<td>string</td>
<td>Shows the state of the locator LED on an expansion module.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On</td>
</tr>
<tr>
<td>locator-led- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for locator-led values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>• Operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Not installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Unknown</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fault</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: N/A</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended action to take to resolve the health issue.</td>
</tr>
<tr>
<td>unhealthy-component</td>
<td>Embedded; see unhealthy-component.</td>
<td></td>
</tr>
<tr>
<td>enclosure-id</td>
<td>Embedded; see expander-ports.</td>
<td></td>
</tr>
<tr>
<td>expander-details</td>
<td>Embedded; see expanders.</td>
<td></td>
</tr>
</tbody>
</table>

**iom-versions**

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

*Table 63. iom-versions properties*

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>Expansion IOM name in the format IOM enclosure-ID,position.</td>
</tr>
<tr>
<td>fw-revision</td>
<td>string</td>
<td>IOM firmware version, short form.</td>
</tr>
<tr>
<td>fw-revision-full</td>
<td>string</td>
<td>IOM firmware version, long form.</td>
</tr>
<tr>
<td>vpd-format-version</td>
<td>string</td>
<td>Vital Product Data (VPD) version.</td>
</tr>
<tr>
<td>vpd-crc</td>
<td>string</td>
<td>VPD CRC.</td>
</tr>
<tr>
<td>cfg-format-version</td>
<td>string</td>
<td>Configuration format version.</td>
</tr>
<tr>
<td>cfg-crc</td>
<td>string</td>
<td>CFG CRC.</td>
</tr>
<tr>
<td>bootloader-version</td>
<td>string</td>
<td>Boot loader version.</td>
</tr>
<tr>
<td>cpld-version</td>
<td>string</td>
<td>Complex Programmable Logic Device (CPLD) firmware version.</td>
</tr>
<tr>
<td>fru-descriptor</td>
<td>string</td>
<td>FRU descriptor.</td>
</tr>
<tr>
<td>part-number</td>
<td>string</td>
<td>IOM part number.</td>
</tr>
<tr>
<td>iom-serial-number</td>
<td>string</td>
<td>IOM serial number.</td>
</tr>
</tbody>
</table>
ipv6-network-parameters

This basetype is used by show ipv6-network-parameters.

Table 64. ipv6-network-parameters properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| controller         | string     | • A: Controller A.  
|                    |            | • B: Controller B.                               |
| controller-numeric | uint32     | Numeric equivalents for controller values.  
|                    |            | • 0: A  
|                    |            | • 1: B                                          |
| autoconfig         | string     | • Enabled  
|                    |            | • Disabled                                       |
| controller-numeric | uint32     | Numeric equivalents for controller values.  
|                    |            | • Disabled  
|                    |            | • Enabled                                         |
| gateway            | string     | The gateway IP address.                          |
| link-local-address | string     | The link-local IPv6 address.                     |
| autoconfig-ip      | string     | The auto-configured IPv6 address for the controller. |
| ip6-address-1      | string     | First IPv6 address for the controller management port, if set. |
| ip6-label-1        | string     | First IPv6 address name, if set.                 |
| ip6-address-2      | string     | Second IPv6 address for the controller management port, if set. |
| ip6-label-2        | string     | Second IPv6 address name, if set.                |
| ip6-address-3      | string     | Third IPv6 address for the controller management port, if set. |
| ip6-label-3        | string     | Third IPv6 address name, if set.                 |
| ip6-address-4      | string     | Fourth IPv6 address for the controller management port, if set. |
| ip6-label-4        | string     | Fourth IPv6 address name, if set.                |
# iscsi-parameters

This basetype is shown by `show iscsi-parameters`.

## Table 65. iscsi-parameters properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>chap</td>
<td>string</td>
<td>Shows whether Challenge-Handshake Authentication Protocol (CHAP) is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: CHAP is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: CHAP is disabled.</td>
</tr>
<tr>
<td>chap-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>chap</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>jumbo-frames</td>
<td>string</td>
<td>Shows whether support for jumbo frames is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: Jumbo-frame support is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Jumbo-frame support is disabled.</td>
</tr>
<tr>
<td>jumbo-frames-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>jumbo-frames</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>isns</td>
<td>string</td>
<td>Shows whether support for Internet Storage Name Service (iSNS) is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: iSNS is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: iSNS is disabled.</td>
</tr>
<tr>
<td>isns-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>isns</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>isns-ip</td>
<td>string</td>
<td>Address of the iSNS server. The default address is all zeroes.</td>
</tr>
<tr>
<td>isns-alt-ip</td>
<td>string</td>
<td>Address of the alternate iSNS server. The default address is all zeroes.</td>
</tr>
<tr>
<td>iscsi-speed</td>
<td>string</td>
<td>iSCSI host port link speed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• auto: The proper speed is auto-negotiated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1Gbps: The speed is forced to 1 Gbit/s, overriding a downshift that can</td>
</tr>
<tr>
<td></td>
<td></td>
<td>occur during auto-negotiation with 1-Gbit/s HBAs. This setting does not apply</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to 10-Gbit/s HBAs.</td>
</tr>
<tr>
<td>iscsi-speed-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>iscsi-speed</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: auto</td>
</tr>
</tbody>
</table>
iscsi-port

This basetype is used by `show ports` for an iSCSI host port.

Table 66. iscsi-port properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>iscsi-ip-version</td>
<td>uint8</td>
<td>iSCSI IP version.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: 1Gbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: iSCSI host port addresses use IPv4 format.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: iSCSI host port addresses use IPv6 format.</td>
</tr>
<tr>
<td>ip-version</td>
<td>string</td>
<td>iSCSI IP version.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IPv4: iSCSI host port addresses use IPv4 format.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IPv6: iSCSI host port addresses use IPv6 format.</td>
</tr>
<tr>
<td>ip-address</td>
<td>string</td>
<td>Assigned port IP address.</td>
</tr>
<tr>
<td>gateway</td>
<td>string</td>
<td>For IPv4, gateway IP address for assigned IP address.</td>
</tr>
<tr>
<td>netmask</td>
<td>string</td>
<td>For IPv4, subnet mask for assigned IP address.</td>
</tr>
<tr>
<td>default-router</td>
<td>string</td>
<td>For IPv6, default router for the assigned IP address.</td>
</tr>
<tr>
<td>link-local-address</td>
<td>string</td>
<td>For IPv6, the link-local address that is automatically generated from the MAC address and assigned to the port.</td>
</tr>
<tr>
<td>mac-address</td>
<td>string</td>
<td>Unique Media Access Control (MAC) hardware address, also called the physical address.</td>
</tr>
<tr>
<td>sfp-status</td>
<td>string</td>
<td>SFP status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not present: No SFP is inserted in this port.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not compatible: The SFP in this port is not qualified for use in this system. When this condition is detected, event 464 is logged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Incorrect protocol: The SFP protocol does not match the port protocol. When this condition is detected, event 464 is logged.</td>
</tr>
<tr>
<td>sfp-status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>sfp-status</code> values.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>sfp-present</td>
<td>string</td>
<td>Shows whether the port contains an SFP.</td>
</tr>
<tr>
<td>sfp-present-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for sfp-present values.</td>
</tr>
<tr>
<td>sfp-vendor</td>
<td>string</td>
<td>The SFP vendor.</td>
</tr>
<tr>
<td>sfp-part-number</td>
<td>string</td>
<td>The SFP part number.</td>
</tr>
<tr>
<td>sfp-revision</td>
<td>string</td>
<td>The SFP revision.</td>
</tr>
<tr>
<td>sfp-10G-compliance</td>
<td>string</td>
<td>The SFP’s 10G compliance code, if supported, or No Support.</td>
</tr>
<tr>
<td>sfp-10G-compliance-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of sfp-10G-compliance values.</td>
</tr>
<tr>
<td>sfp-ethernet-compliance</td>
<td>string</td>
<td>The SFP’s Ethernet compliance code, if supported, or No Support.</td>
</tr>
<tr>
<td>sfp-ethernet-compliance-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of sfp-ethernet-compliance values.</td>
</tr>
<tr>
<td>sfp-cable-technology</td>
<td>string</td>
<td>Shows whether the SFP supports active or passive cable technology.</td>
</tr>
<tr>
<td>sfp-cable-technology-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of sfp-cable-technology values.</td>
</tr>
<tr>
<td>sfp-cable-length</td>
<td>uint8</td>
<td>The link length (in meters) that is supported by the SFP while operating in compliance with applicable standards for the cable type.</td>
</tr>
</tbody>
</table>

### license

This basetype is used by `show license`.

**Table 67. license properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>license-key</td>
<td>string</td>
<td>• The license key, if a license is installed and valid.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blank if a license is not installed.</td>
</tr>
<tr>
<td>license-serial-number</td>
<td>string</td>
<td>The serial number to use when requesting a license.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>platform-max-snapshots</td>
<td>uint32</td>
<td>Maximum number of snapshots that the highest-level license allows.</td>
</tr>
<tr>
<td>base-max-snapshots</td>
<td>uint32</td>
<td>Maximum number of snapshots allowed without an installed license.</td>
</tr>
<tr>
<td>max-snapshots</td>
<td>uint32</td>
<td>Maximum number of snapshots allowed by the installed license.</td>
</tr>
<tr>
<td>in-use-snapshots</td>
<td>uint32</td>
<td>Number of existing licensed snapshots.</td>
</tr>
<tr>
<td>max-snapshots-expiry</td>
<td>string</td>
<td>Shows when the snapshot license will expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Never: License doesn't expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• days: Number of days remaining for a temporary license.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expired: Temporary license has expired and cannot be renewed.</td>
</tr>
<tr>
<td>max-snapshots-expiry-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for max-snapshots-expiry values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 255: Expired</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• days: Number of days remaining</td>
</tr>
<tr>
<td>virtualization</td>
<td>string</td>
<td>Shows whether the capability to create and manage virtual pools is enabled or disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: The capability is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The capability is enabled.</td>
</tr>
<tr>
<td>virtualization-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for virtualization values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>virtualization-expiry</td>
<td>string</td>
<td>Shows when the virtualization license will expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Never: License is purchasable and doesn't expire.</td>
</tr>
<tr>
<td>virtualization-expiry-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for virtualization-expiry values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Never</td>
</tr>
<tr>
<td>performance-tier</td>
<td>string</td>
<td>Shows whether the capability to create a Performance tier comprised of SSDs is enabled or disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: The capability is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The capability is enabled.</td>
</tr>
<tr>
<td>performance-tier-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for performance-tier values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>performance-tier- expiry</td>
<td>string</td>
<td>Shows when the performance tier license will expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Never: License is purchasable and doesn't expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- days: Number of days remaining for a temporary license.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Expired: Temporary license has expired and cannot be renewed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Never</td>
</tr>
<tr>
<td>volume-copy</td>
<td>string</td>
<td>Shows whether the capability to copy volumes is enabled or disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disabled: The capability is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled: The capability is enabled.</td>
</tr>
<tr>
<td>volume-copy-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for volume-copy values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td>volume-copy-expiry</td>
<td>string</td>
<td>Shows when the volume copy license will expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Never: Always enabled and doesn't expire.</td>
</tr>
<tr>
<td>volume-copy-expiry-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for volume-copy-expiry values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Never</td>
</tr>
<tr>
<td>remote-snapshot- replication</td>
<td>string</td>
<td>Shows whether the capability to replicate volumes to a remote system is enabled or disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disabled: The capability is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled: The capability is enabled.</td>
</tr>
<tr>
<td>remote-snapshot- replication-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for remote-snapshot-replication values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td>remote-snapshot- replication-expiry</td>
<td>string</td>
<td>Shows when the volume replication feature will expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Never: License is purchasable and doesn't expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- days: Number of days remaining for a temporary license.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>remote-snapshot-replication-expiry-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for remote-snapshot-replication values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 255: Expired</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• days: Number of days remaining</td>
</tr>
<tr>
<td>vds</td>
<td>string</td>
<td>Shows whether the VDS (Virtual Disk Service) Hardware Provider is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: VDS is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: VDS is enabled.</td>
</tr>
<tr>
<td>vds-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for vds values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>vds-expiry</td>
<td>string</td>
<td>Shows when the VDS (Virtual Disk Service) Hardware Provider will expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Never: License and doesn’t expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• days: Number of days remaining for a temporary license.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expired: Temporary license has expired and cannot be renewed.</td>
</tr>
<tr>
<td>vds-expiry-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for vds-expiry values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 255: Expired</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• days: Number of days remaining</td>
</tr>
<tr>
<td>vss</td>
<td>string</td>
<td>Shows whether the VSS (Volume Shadow Copy Service) Hardware Provider is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: VSS is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: VSS is enabled.</td>
</tr>
<tr>
<td>vss-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for vss values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>vss-expiry</td>
<td>string</td>
<td>Shows when the VSS (Volume Shadow Copy Service) Hardware Provider will expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Never: License and doesn’t expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• days: Number of days remaining for a temporary license.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expired: Temporary license has expired and cannot be renewed.</td>
</tr>
<tr>
<td>vss-expiry-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for vss-expiry values.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>dsd</td>
<td>string</td>
<td>Shows whether the Drive Spin Down (DSD) feature is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disabled: DSD is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled: DSD is enabled.</td>
</tr>
<tr>
<td>dsd-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for dsd values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Enabled</td>
</tr>
<tr>
<td>dsd-expiry</td>
<td>string</td>
<td>Shows when the Drive Spin Down (DSD) feature will expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Never: Always enabled and doesn't expire.</td>
</tr>
<tr>
<td>dsd-expiry-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for dsd-expiry values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Never</td>
</tr>
<tr>
<td>sra</td>
<td>string</td>
<td>Shows whether Storage Replication Adapter (SRA) support is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disabled: SRA is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled: SRA is enabled.</td>
</tr>
<tr>
<td>sra-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for sra values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Enabled</td>
</tr>
<tr>
<td>sra-expiry</td>
<td>string</td>
<td>Shows when the SRA feature will expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Never: License and doesn't expire.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- days: Number of days remaining for a temporary license.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Expired: Temporary license has expired and cannot be renewed.</td>
</tr>
<tr>
<td>sra-expiry-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for sra-expiry values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 255: Expired</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- days: Number of days remaining</td>
</tr>
</tbody>
</table>
**local-ports**

This basetype is used by `show peer-connections`.

**Table 68. local-ports properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>local-host-port</td>
<td>string</td>
<td>The ID of the port in the local system.</td>
</tr>
<tr>
<td>port-address</td>
<td>string</td>
<td>The assigned port address.</td>
</tr>
</tbody>
</table>

**local-ports-detail**

This basetype is used by `show peer-connections` when the `verify-links` parameter is specified.

**Table 69. local-ports-detail properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>local-host-port</td>
<td>string</td>
<td>The ID of the port in the local system.</td>
</tr>
<tr>
<td>port-address</td>
<td>string</td>
<td>The assigned port address.</td>
</tr>
<tr>
<td>remote-links</td>
<td>string</td>
<td>The IDs of linked ports in the remote system.</td>
</tr>
</tbody>
</table>

**log-header-table**

This basetype is used in the log file downloaded from the system by using the ME Storage Manager or FTP.

**Table 70. log-header-table properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>log-contact</td>
<td>string</td>
<td>Contact person's name, if specified in the MESM Save Logs panel.</td>
</tr>
<tr>
<td>log-email</td>
<td>string</td>
<td>Contact's email address, if specified in the MESM Save Logs panel.</td>
</tr>
<tr>
<td>log-phone</td>
<td>string</td>
<td>Contact's phone number, if specified in the MESM Save Logs panel.</td>
</tr>
<tr>
<td>log-comments</td>
<td>string</td>
<td>Comments describing the problem and specifying the date and time when the problem occurred, if specified in the MESM Save Logs panel.</td>
</tr>
<tr>
<td>log-content</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>log-timestamp</td>
<td>string</td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds</code> (UTC), when log content was saved to the file.</td>
</tr>
<tr>
<td>log-timestamp-numeric</td>
<td>uint32</td>
<td>Unformatted log-timestamp value.</td>
</tr>
</tbody>
</table>
**mgmt-hostnames**

This basetype is used by `show dns-management-hostname`.

**Table 71. mgmt-hostnames properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>controller</td>
<td>string</td>
<td>• A: Controller A. • B: Controller B.</td>
</tr>
<tr>
<td>controller-numeric</td>
<td>uint32</td>
<td>• 0: B • 1: A</td>
</tr>
<tr>
<td>mgmt-hostname</td>
<td>string</td>
<td>The controller’s management host name.</td>
</tr>
<tr>
<td>domain-name</td>
<td>string</td>
<td>The controller’s FQDN or ‘-’.</td>
</tr>
</tbody>
</table>

**midplane-versions**

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

**Table 72. midplane-versions**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vpd-format-version</td>
<td>string</td>
<td>Vital Product Data (VPD) version.</td>
</tr>
<tr>
<td>vpd-crc</td>
<td>string</td>
<td>VPD CRC.</td>
</tr>
<tr>
<td>cfg-mismatch-version</td>
<td>string</td>
<td>Configuration mismatch version.</td>
</tr>
<tr>
<td>cpld-version</td>
<td>string</td>
<td>Complex Programmable Logic Device (CPLD) firmware version.</td>
</tr>
<tr>
<td>fru-descriptor</td>
<td>string</td>
<td>FRU descriptor.</td>
</tr>
<tr>
<td>part-number</td>
<td>string</td>
<td>Midplane part number.</td>
</tr>
<tr>
<td>midplane-serial-number</td>
<td>string</td>
<td>Midplane serial number.</td>
</tr>
</tbody>
</table>

**network-parameters**

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

**Table 73. properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Controller network port ID in the format mgmtport_controller-ID.</td>
</tr>
<tr>
<td>active-version</td>
<td>uint32</td>
<td>The configured network port IP version.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: IPv4 • 6: IPv6</td>
</tr>
<tr>
<td>ip-address</td>
<td>string</td>
<td>Controller network port IP address.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>gateway</td>
<td>string</td>
<td>Controller network port gateway IP address</td>
</tr>
<tr>
<td>subnet-mask</td>
<td>string</td>
<td>Controller network port IP subnet mask</td>
</tr>
<tr>
<td>mac-address</td>
<td>string</td>
<td>Controller network port MAC address.</td>
</tr>
<tr>
<td>addressing-mode</td>
<td>string</td>
<td>• Manual: Network settings are set manually (statically).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• DHCP: DHCP is used to set network parameters.</td>
</tr>
<tr>
<td>addressing-mode-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for addressing-mode values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Manual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: DHCP</td>
</tr>
<tr>
<td>link-speed</td>
<td>string</td>
<td>• Unknown: For a system operating in Single Controller mode, this controller module is not present.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 10mbps: The network port link speed is set to 10 Mb/s.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 100mbps: The network port link speed is set to 100 Mb/s.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1000mbps: The network port link speed is set to 1000 Mb/s.</td>
</tr>
<tr>
<td>link-speed-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for link-speed values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: 10mbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: 100mbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: 1000mbps</td>
</tr>
<tr>
<td>duplex-mode</td>
<td>string</td>
<td>• Undefined: For a system operating in Single Controller mode, this controller module is not present.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Half: The network port duplex mode is set to half duplex.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Full: The network port duplex mode is set to full duplex.</td>
</tr>
<tr>
<td>duplex-mode-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for duplex-mode values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: full</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: half</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Undefined</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>The health of the network connection.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended actions to take to resolve the health issue.</td>
</tr>
<tr>
<td>ping-broadcast</td>
<td>string</td>
<td>- Enabled: The system will respond to a broadcast ping.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disabled: The system will not respond to a broadcast ping.</td>
</tr>
<tr>
<td>ping-broadcast-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for ping-broadcast values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Enabled</td>
</tr>
</tbody>
</table>

**ntp-status**

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

**Table 74. ntp-status properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ntp-status</td>
<td>string</td>
<td>Shows whether use of Network Time Protocol (NTP) is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- activated: NTP is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- deactivated: NTP is disabled.</td>
</tr>
<tr>
<td>ntp-server-address</td>
<td>string</td>
<td>- The current NTP server IP address if NTP is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The last-set NTP server IP address if NTP was enabled and has been disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0.0.0.0 if the NTP server IP address has not been set.</td>
</tr>
<tr>
<td>ntp-contact-time</td>
<td>string</td>
<td>(UTC), of the last message received from the NTP server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Date and time, in the format <code>year-month-day hour:minutes:seconds (UTC)</code> of the last message received from the NTP server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- none: No contact.</td>
</tr>
</tbody>
</table>
**peer-connection-info**

This basetype is used by `query peer-connection`.

**Table 75. peer-connection-info properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>system-name</td>
<td>string</td>
<td>The name of the system.</td>
</tr>
<tr>
<td>system-contact</td>
<td>string</td>
<td>The name of the person who administers the system.</td>
</tr>
<tr>
<td>system-location</td>
<td>string</td>
<td>The location of the system.</td>
</tr>
<tr>
<td>system-information</td>
<td>string</td>
<td>A brief description of what the system is used for or how it is configured.</td>
</tr>
<tr>
<td>midplane-serial-number</td>
<td>string</td>
<td>The serial number of the controller enclosure midplane.</td>
</tr>
<tr>
<td>vendor-name</td>
<td>string</td>
<td>The vendor name.</td>
</tr>
<tr>
<td>product-id</td>
<td>string</td>
<td>The product model identifier.</td>
</tr>
<tr>
<td>license-key and other license properties</td>
<td></td>
<td>See license.</td>
</tr>
<tr>
<td>peer-controllers</td>
<td></td>
<td>Embedded; see <code>peer-controllers</code>.</td>
</tr>
</tbody>
</table>

**peer-connections**

This basetype is used by `show peer-connections`.

**Table 76. peer-connections properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>peer-connection-name</td>
<td>string</td>
<td>The name of the peer connection.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the peer connection.</td>
</tr>
<tr>
<td>connection-type</td>
<td>string</td>
<td>The type of ports being used for the peer connection:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• FC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• iSCSI</td>
</tr>
<tr>
<td>connection-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>connection-type</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: FC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: iSCSI</td>
</tr>
<tr>
<td>connection-status</td>
<td>string</td>
<td>• Online: The systems have a valid connection.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Offline: No connection is available to the remote system.</td>
</tr>
<tr>
<td>connection-status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>connection-status</code> values.</td>
</tr>
</tbody>
</table>
### health
- **Type:** string
- **Description:**
  - OK
  - Fault
  - Unknown

### health-numeric
- **Type:** uint32
- **Description:** Numeric equivalents for health values.
  - 0: OK
  - 1: Degraded
  - 2: Fault
  - 3: Unknown
  - 4: N/A

### health-reason
- **Type:** string
- **Description:** If Health is not OK, this field shows the reason for the health state.

### health-recommendation
- **Type:** string
- **Description:** If Health is not OK, this field shows recommended actions to take to resolve the health issue.

### local-ports
- **Type:** Embedded; see local-ports.

### remote-ports
- **Type:** Embedded; see remote-ports.

---

### peer-controllers

This basetype is used by query peer-connection.

#### Table 77. peer-controllers properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>controller</td>
<td>string</td>
<td>A: Controller A.</td>
</tr>
<tr>
<td>controller-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller values.</td>
</tr>
<tr>
<td>sc-fw</td>
<td>string</td>
<td>Storage Controller firmware version.</td>
</tr>
<tr>
<td>sc-loader</td>
<td>string</td>
<td>Storage Controller loader firmware version.</td>
</tr>
<tr>
<td>mc-fw</td>
<td>string</td>
<td>Management Controller firmware version.</td>
</tr>
<tr>
<td>mc-loader</td>
<td>string</td>
<td>Management Controller loader firmware version.</td>
</tr>
<tr>
<td>ec-fw</td>
<td>string</td>
<td>Controller firmware version.</td>
</tr>
<tr>
<td>pld-rev</td>
<td>string</td>
<td>Complex Programmable Logic Device (CPLD) firmware version.</td>
</tr>
<tr>
<td>hw-rev</td>
<td>string</td>
<td>Controller hardware version.</td>
</tr>
<tr>
<td>ip-address</td>
<td>string</td>
<td>Controller network port IP address.</td>
</tr>
</tbody>
</table>
### peer-ports

This basetype is used by query peer-connection.

#### Table 78. peer-ports properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>local-host-port</td>
<td>string</td>
<td>The ID of the port in the local system.</td>
</tr>
<tr>
<td>connection-type</td>
<td>string</td>
<td>The type of ports being used for the peer connection:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• iSCSI</td>
</tr>
<tr>
<td>connection-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>connection-type</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: iSCSI</td>
</tr>
<tr>
<td>host-port-health</td>
<td>string</td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A</td>
</tr>
<tr>
<td>host-port-health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>health</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: N/A</td>
</tr>
<tr>
<td>port-address</td>
<td>string</td>
<td>The assigned port address.</td>
</tr>
<tr>
<td>local-links</td>
<td>string</td>
<td>The IDs of linked ports in the local system.</td>
</tr>
</tbody>
</table>
# pool-hist-statistics

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

## Table 79. pool-hist-statistics properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number-of- ios</td>
<td>uint64</td>
<td>The total number of read and write operations since the last sampling time.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>The number of read operations since the last sampling time.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>The number of write operations since the last sampling time.</td>
</tr>
<tr>
<td>total-data- transferred</td>
<td>string</td>
<td>The total amount of data read and written since the last sampling time.</td>
</tr>
<tr>
<td>total-data- transferred- numeric</td>
<td>uint64</td>
<td>Unformatted total-data-transferred value.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>The amount of data read since the last sampling time.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>The amount of data written since the last sampling time.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>The amount of data written since the last sampling time.</td>
</tr>
<tr>
<td>data-written- numeric</td>
<td>uint64</td>
<td>The amount of data written since the last sampling time.</td>
</tr>
<tr>
<td>total-iops</td>
<td>uint64</td>
<td>The total number of read and write operations per second since the last sampling time.</td>
</tr>
<tr>
<td>read-iops</td>
<td>uint64</td>
<td>The number of read operations per second since the last sampling time.</td>
</tr>
<tr>
<td>write-iops</td>
<td>uint64</td>
<td>The number of write operations per second since the last sampling time.</td>
</tr>
<tr>
<td>total-bytes-per- sec</td>
<td>string</td>
<td>The total data transfer rate, in bytes per second, since the last sampling time.</td>
</tr>
<tr>
<td>total-bytes-per- sec-numeric</td>
<td>uint64</td>
<td>Unformatted total-bytes-per-second value.</td>
</tr>
<tr>
<td>read-bytes-per-sec</td>
<td>string</td>
<td>The data transfer rate, in bytes per second, for read operations since the last sampling time.</td>
</tr>
<tr>
<td>read-bytes-per- sec-numeric</td>
<td>uint64</td>
<td>Unformatted read-bytes-per-second value.</td>
</tr>
<tr>
<td>write-bytes-per- sec</td>
<td>string</td>
<td>The data transfer rate, in bytes per second, for write operations since the last sampling time.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>write-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted write-bytes-per-second value.</td>
</tr>
<tr>
<td>number-of-allocated-pages</td>
<td>uint64</td>
<td>The number of 4 MB pages allocated to volumes in the pool.</td>
</tr>
<tr>
<td>sample-time</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds, when the data sample was taken.</td>
</tr>
<tr>
<td>sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted sample-time value.</td>
</tr>
</tbody>
</table>

### pool-statistics

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

**Table 80. pool-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sample-time</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds, when the data sample was taken.</td>
</tr>
<tr>
<td>sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted sample-time value.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the pool.</td>
</tr>
<tr>
<td>pool</td>
<td>string</td>
<td>The name of the pool.</td>
</tr>
<tr>
<td>pages-alloc-per-minute</td>
<td>uint32</td>
<td>The rate, in pages per minute, at which pages are allocated to volumes in the pool because they need more space to store data.</td>
</tr>
<tr>
<td>pages-alloc-per-hour</td>
<td>uint32</td>
<td>The rate, in pages per hour, at which pages are allocated to volumes in the pool because they need more space to store data.</td>
</tr>
<tr>
<td>pages-dealloc-per-minute</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>pages-dealloc-per-hour</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>num-pages-unmap-per-minute</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>num-pages-unmap-per-hour</td>
<td>uint32</td>
<td>The number of 4 MB pages that host systems have unmapped per hour, through use of the SCSI UNMAP command, to free</td>
</tr>
</tbody>
</table>
### pool-summary

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

#### Table 81. pool-summary properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the pool.</td>
</tr>
<tr>
<td>pool</td>
<td>string</td>
<td>The name of the pool.</td>
</tr>
<tr>
<td>pool-hist- statistics</td>
<td>Embedded</td>
<td>see <code>pool-hist-statistics</code>.</td>
</tr>
</tbody>
</table>

#### Table 80. pool-summary properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the pool.</td>
</tr>
<tr>
<td>pool</td>
<td>string</td>
<td>The name of the pool.</td>
</tr>
<tr>
<td>pool-hist- statistics</td>
<td>Embedded</td>
<td>see <code>pool-hist-statistics</code>.</td>
</tr>
</tbody>
</table>
## pools

This basetype is used by show configuration and show pools.

### Table 82. pools properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the pool.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the pool.</td>
</tr>
<tr>
<td>url</td>
<td>string</td>
<td>Pool URL.</td>
</tr>
</tbody>
</table>
| storage-type       | string       | • Linear: Linear pool.  
                    |              | • Virtual: Virtual pool. |
| storage-type- numeric | uint32     | Numeric equivalents for storage-type values.  
                    |              | • 0: Linear  
                    |              | • 1: Virtual |
| blocksize          | uint32       | The size of a block, in bytes. |
| total-size         | string       | The total capacity of the pool. |
| total-size-numeric | unit64       | Unformatted total-size value in blocks. |
| total-avail        | string       | The available capacity in the pool. |
| total-avail- numeric | unit64     | Unformatted total-avail value in blocks. |
| snap-size          | string       | Not applicable. |
| snap-size-numeric  | unit64       | Not applicable. |
| allocated-pages    | uint32       | For a virtual pool, the number of 4 MB pages that are currently in use. For a linear pool, 0. |
| available-pages    | uint32       | For a virtual pool, the number of 4 MB pages that are still available to be allocated. For a linear pool, 0. |
| overcommit         | string       | • Disabled: The capacity allocated to volumes when they are created 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 overcommit values.  
                    |              | • 0: Disabled  
                    |              | • 1: Enabled  
<pre><code>                |              | • 2: N/A |
</code></pre>
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| over-committed        | string     | - True: The pool is overcommitted.  
|                       |            | - False: The pool is not overcommitted.                                                          |
| over-committed-numeric| uint32     | Numeric equivalents for over-committed values.                                                  |
|                       |            | - 0: Disabled  
|                       |            | - 1: Enabled                                                                                     |
| disk-groups           | uint16     | The number of disk groups in the pool.                                                           |
| volumes               | uint16     | The number of volumes in the pool.                                                               |
| page-size             | string     | The page size, formatted to use the current base, precision, and units.                          |
| page-size-numeric     | uint64     | Unformatted page-size value in blocks.                                                           |
| low-threshold         | string     | The low threshold for page allocation as a percentage of pool capacity.                         |
| middle-threshold      | string     | The middle threshold for page allocation as a percentage of pool capacity.                      |
| high-threshold        | string     | The high threshold for page allocation as a percentage of pool capacity. The threshold value is automatically calculated based on the available capacity of the pool minus 200 GB of reserved space. |
| utility-running       | string     | Job running on the disk, if any.  
|                       |            | - (blank): None.  
<p>|                       |            | - DRSC: The disk group is being scrubbed.                                                        |
|                       |            | - EXPD: The disk group is being expanded.                                                         |
|                       |            | - INIT: The disk group is being initialized.                                                      |
|                       |            | - RBAL: The ADAPT disk group is being rebalanced.                                                 |
|                       |            | - RCON: 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.                                                         |
| utility-running-numeric| uint32     | Numeric equivalents for job-running values.                                                     |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>preferred-owner</td>
<td>string</td>
<td>Controller that owns the disk group and its volumes during normal operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: INIT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: RCON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: VRFY</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: EXPD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: VRSC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7: DRSC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 9: VREMV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 12: VPREP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 13: VDRAIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 14: VRECV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 16: RBAL</td>
</tr>
<tr>
<td>preferred-owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for preferred-owner values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: A</td>
</tr>
<tr>
<td>owner</td>
<td>string</td>
<td>Current owner, which is either the preferred owner during normal operation or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the partner controller when the preferred owner is offline.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• B: Controller B.</td>
</tr>
<tr>
<td>owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for owner values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: A</td>
</tr>
<tr>
<td>rebalance</td>
<td>string</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>rebalance-numeric</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>migration</td>
<td>string</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>migration-numeric</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>zero-scan</td>
<td>string</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>zero-scan-numeric</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>idle-page-check</td>
<td>string</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>idle-page-check-numeric</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>read-flash-cache</td>
<td>string</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>read-flash-cache-numeric</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>metadata-vol-size</td>
<td>string</td>
<td>The size of the pool's metadata volume, formatted to use the current base, precision, and units. Needs to be taken into consideration for all pages in the pool that are used.</td>
</tr>
<tr>
<td>metadata-vol-size-numeric</td>
<td>uint64</td>
<td>Unformatted metadata-vol-size value in blocks.</td>
</tr>
<tr>
<td>total-rfc-size</td>
<td>string</td>
<td>The total size in blocks of the read cache in the pool.</td>
</tr>
<tr>
<td>total-rfc-size-numeric</td>
<td>uint64</td>
<td>Unformatted total-rfc-size value in blocks.</td>
</tr>
<tr>
<td>available-rfc-size</td>
<td>string</td>
<td>The unused read-cache space in blocks that is available for use by the pool.</td>
</tr>
<tr>
<td>available-rfc-size-numeric</td>
<td>uint64</td>
<td>Unformatted available-rfc-size value in blocks.</td>
</tr>
<tr>
<td>reserved-size</td>
<td>string</td>
<td>The total number of pages that are reserved for virtual volumes in the pool.</td>
</tr>
<tr>
<td>reserved-size-numeric</td>
<td>uint64</td>
<td>Unformatted reserved-size value in blocks.</td>
</tr>
<tr>
<td>reserved-unalloc-size</td>
<td>string</td>
<td>The total number of pages that are reserved, but not yet allocated, for virtual volumes in the pool.</td>
</tr>
<tr>
<td>reserved-unalloc-size-numeric</td>
<td>uint64</td>
<td>Unformatted reserved-unalloc-size value in blocks.</td>
</tr>
<tr>
<td>pool-sector-format</td>
<td>string</td>
<td>The sector format of disks in the disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 512n: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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).</td>
</tr>
<tr>
<td>pool-sector-format-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for pool-sector-numeric values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: 512n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: 512e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Mixed</td>
</tr>
</tbody>
</table>

API basetype properties 385
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>health</td>
<td>string</td>
<td>• OK&lt;br&gt;• Degraded&lt;br&gt;• Fault&lt;br&gt;• N/A&lt;br&gt;• Unknown</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.&lt;br&gt;• 0: OK&lt;br&gt;• 1: Degraded&lt;br&gt;• 2: Fault&lt;br&gt;• 3: Unknown&lt;br&gt;• 4: N/A</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended actions to take to resolve the health issue.</td>
</tr>
<tr>
<td>disk-groups</td>
<td>Embedded; see disk-groups.</td>
<td></td>
</tr>
<tr>
<td>tiers</td>
<td>Embedded; see tiers.</td>
<td></td>
</tr>
<tr>
<td>unhealthy-component</td>
<td>Embedded; see unhealthy-component.</td>
<td></td>
</tr>
</tbody>
</table>

**port**

This basetype is used by `show configuration` and `show ports`.

**Table 83. port properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Controller host port ID in the format <code>hostport_controller-ID-and-port-number</code>.</td>
</tr>
<tr>
<td>controller</td>
<td>string</td>
<td>• A: Controller A.&lt;br&gt;• B: Controller B.</td>
</tr>
<tr>
<td>controller-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller values.&lt;br&gt;• 0: B&lt;br&gt;• 1: A</td>
</tr>
<tr>
<td>port</td>
<td>string</td>
<td>Controller ID and port number.</td>
</tr>
<tr>
<td>port-type</td>
<td>string</td>
<td>• FC: Fibre Channel.&lt;br&gt;• iSCSI: Internet SCSI.&lt;br&gt;• SAS: Serial Attached SCSI.</td>
</tr>
<tr>
<td>port-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for port-type values.&lt;br&gt;• 0: UNKNOWN&lt;br&gt;• 6: FC</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>media</td>
<td>string</td>
<td>• FC(P): Fibre Channel Point-to-Point.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• FC(L): Fibre Channel-Arbitrated Loop (public or private).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• FC(−): Not applicable, as when the port is disconnected.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SAS: Serial Attached SCSI.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• iSCSI: Internet SCSI.</td>
</tr>
<tr>
<td>target-id</td>
<td>string</td>
<td>• For an FC port, its WWPN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For a SAS port, its WWPN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For an iSCSI port, its node name (typically the IQN).</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Port status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Up: The port is cabled and has an I/O link.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warning: Not all of the port’s PHYs are up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Error: The port is reporting an error condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Present: The controller module is not installed or is down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disconnected: Either no I/O link is detected or the port is not cabled.</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Not Present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: Disconnected</td>
</tr>
<tr>
<td>actual-speed</td>
<td>string</td>
<td>Actual link speed in Mbit/s or Gbit/s.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 10Mb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 100Mb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 12Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 16Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• (blank): Port is disconnected.</td>
</tr>
<tr>
<td>actual-speed-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for actual-speed values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: 1Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: 4Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: 6Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7: 8Gb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8: 10Mb</td>
</tr>
</tbody>
</table>
### Name | Type | Description
--- | --- | ---
configured-speed | string | Configured host-port link speed in Gbit/s.
  - Auto
  - 1Gb
  - 4Gb
  - 8Gb
  - 12Gb
  - 16Gb

configured-speed-numeric | uint32 | Numeric equivalents for configured-speed values.
  - 0: 1Gb
  - 2: 4Gb
  - 3: Auto
  - 7: 8Gb
  - 11: 12Gb
  - 12: 16Gb

health | string |OK
  - Degraded
  - Fault
  - N/A
  - Unknown

health-numeric | uint32 | Numeric equivalents for health values.
  - 0: OK
  - 1: Degraded
  - 2: Fault
  - 3: Unknown
  - 4: N/A

health-reason | string | If Health is not OK, the reason for the health state.

health-recommendation | string | If Health is not OK, the recommended actions to take to resolve the health issue.

port-details | Embedded; see fc-port, iscsi-port, sas-port |  

### power-supplies

This basetype is used by show power-supplies.

### Table 84. power-supplies properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Power supply ID in the format <code>psu_enclosure-ID.power-supply-number</code>.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>dom-id</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Power supply serial number.</td>
</tr>
<tr>
<td>part-number</td>
<td>string</td>
<td>FRU part number.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>FRU long description.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>Power supply identifier and location.</td>
</tr>
<tr>
<td>fw-revision</td>
<td>string</td>
<td>• (blank): Not applicable. • Firmware revision of the power supply.</td>
</tr>
<tr>
<td>revision</td>
<td>string</td>
<td>FRU hardware revision level.</td>
</tr>
<tr>
<td>model</td>
<td>string</td>
<td>Power supply model.</td>
</tr>
<tr>
<td>vendor</td>
<td>string</td>
<td>Power supply vendor.</td>
</tr>
<tr>
<td>location</td>
<td>string</td>
<td>Power supply location in the format Enclosure enclosure-ID - position, where the position is as viewed from the back of the enclosure.</td>
</tr>
<tr>
<td>position</td>
<td>string</td>
<td>Power supply position, as viewed from the back of the enclosure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Left • Right • Top • Bottom</td>
</tr>
<tr>
<td>position-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for position values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Left • 1: Right • 2: Top • 3: Bottom</td>
</tr>
<tr>
<td>dash-level</td>
<td>string</td>
<td>FRU template revision number.</td>
</tr>
<tr>
<td>fru-shortname</td>
<td>string</td>
<td>FRU short description.</td>
</tr>
<tr>
<td>mfg-date</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds (UTC), when the power supply module was manufactured.</td>
</tr>
<tr>
<td>mfg-date-numeric</td>
<td>uint32</td>
<td>Unformatted mfg-date value.</td>
</tr>
<tr>
<td>mfg-location</td>
<td>string</td>
<td>City, state/province, and country where the FRU was manufactured.</td>
</tr>
<tr>
<td>mfg-vendor-id</td>
<td>string</td>
<td>JEDEC ID of the FRU manufacturer.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>configuration-serialnumber</td>
<td>string</td>
<td>Configuration serial number.</td>
</tr>
<tr>
<td>dcf12v</td>
<td>uint32</td>
<td>Deprecated; power-supply sensor status is shown by the sensors property.</td>
</tr>
<tr>
<td>dcf5v</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>dcf33v</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>dcf12i</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>dcf5i</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>dctimep</td>
<td>uint32</td>
<td></td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Power supply status.</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td>unhealthy-component</td>
<td>Embedded; see unhealthy-component.</td>
<td></td>
</tr>
<tr>
<td>fan-details</td>
<td>Embedded; see fan.</td>
<td></td>
</tr>
</tbody>
</table>
product-info
This basetype is used by show inquiry.

Table 85. product-info properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vendor-name</td>
<td>string</td>
<td>Vendor name.</td>
</tr>
<tr>
<td>product-id</td>
<td>string</td>
<td>Product model identifier.</td>
</tr>
<tr>
<td>scsi-vendor-id</td>
<td>string</td>
<td>Vendor name returned by the SCSI INQUIRY command.</td>
</tr>
</tbody>
</table>

provisioning
This basetype is used by show provisioning.

Table 86. provisioning properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>volume</td>
<td>string</td>
<td>• Volume name. • Blank if the disk group or pool does not have a volume.</td>
</tr>
<tr>
<td>volume-serial</td>
<td>string</td>
<td>Volume serial number.</td>
</tr>
<tr>
<td>wwn</td>
<td>string</td>
<td>• Volume World Wide Name. • Blank if the disk group or pool does not have a volume.</td>
</tr>
<tr>
<td>controller</td>
<td>string</td>
<td>Owning controller of the disk group or pool.</td>
</tr>
<tr>
<td>controller-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller values.</td>
</tr>
<tr>
<td>disk-display</td>
<td>string</td>
<td>Shorthand list of the disks within a disk group or pool.</td>
</tr>
<tr>
<td>disk-display-full</td>
<td>string</td>
<td>List or range of the disks in the disk group or pool specified by the virtual-disk property.</td>
</tr>
<tr>
<td>virtual-disk</td>
<td>string</td>
<td>Name of the disk group or pool.</td>
</tr>
<tr>
<td>virtual-disk-serial</td>
<td>string</td>
<td>Serial number of the disk group or pool.</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>Health of the associated disk group or pool.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OK • Degraded • Fault • N/A</td>
</tr>
</tbody>
</table>
### health-numeric

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 4: N/A</td>
</tr>
</tbody>
</table>

### mapped

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mapped</td>
<td>string</td>
<td>- Yes: The volume is mapped.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- No: The volume is not mapped.</td>
</tr>
</tbody>
</table>

### proxy-information

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

#### Table 87. proxy-information properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>proxy-state</td>
<td>string</td>
<td>- Disabled: Use of a proxy host for SupportAssist is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled: Use of a proxy host for SupportAssist is enabled.</td>
</tr>
<tr>
<td>proxy-state-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for proxy-state-numeric values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Enabled</td>
</tr>
<tr>
<td>host</td>
<td>string</td>
<td>The proxy host ID.</td>
</tr>
<tr>
<td>port</td>
<td>string</td>
<td>The proxy host port number.</td>
</tr>
<tr>
<td>protocol</td>
<td>string</td>
<td>- HTTP</td>
</tr>
<tr>
<td>protocol-numeric</td>
<td>uint32</td>
<td>- 0: HTTP</td>
</tr>
<tr>
<td>user-name</td>
<td>string</td>
<td>The proxy user name used to access the proxy server.</td>
</tr>
</tbody>
</table>

### psu-versions

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

#### Table 88. psu-versions properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>Power supply unit (PSU) name in the format PSU enclosure-ID,position.</td>
</tr>
<tr>
<td>fw-revision</td>
<td>string</td>
<td>PSU firmware version.</td>
</tr>
<tr>
<td>dsp-version</td>
<td>string</td>
<td>PSU Digital Signal Processor (DSP) firmware version.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>vpd-format-version</td>
<td>string</td>
<td>Vital Product Data (VPD) version.</td>
</tr>
<tr>
<td>vpd-crc</td>
<td>string</td>
<td>VPD CRC.</td>
</tr>
<tr>
<td>fru-descriptor</td>
<td>string</td>
<td>FRU descriptor.</td>
</tr>
<tr>
<td>part-number</td>
<td>string</td>
<td>PSU part number.</td>
</tr>
<tr>
<td>psu-serial-number</td>
<td>string</td>
<td>PSU serial number.</td>
</tr>
</tbody>
</table>

**readcache-hist-statistics**

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

**Table 89. readcache-hist-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>number-of-ios</td>
<td>uint64</td>
<td>The total number of read and write operations since the last sampling time.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>The number of read operations since the last sampling time.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>The number of write operations since the last sampling time.</td>
</tr>
<tr>
<td>total-data-transferred</td>
<td>string</td>
<td>The total amount of data read and written since the last sampling time.</td>
</tr>
<tr>
<td>total-data-transferred-numeric</td>
<td>uint64</td>
<td>Unformatted total-data-transferred value.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>The amount of data read since the last sampling time.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>The amount of data written since the last sampling time.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>The amount of data written since the last sampling time.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>The amount of data written since the last sampling time.</td>
</tr>
<tr>
<td>total-iops</td>
<td>uint64</td>
<td>The total number of read and write operations per second since the last sampling time.</td>
</tr>
<tr>
<td>read-iops</td>
<td>uint64</td>
<td>The number of read operations per second since the last sampling time.</td>
</tr>
<tr>
<td>write-iops</td>
<td>uint64</td>
<td>The number of write operations per second since the last sampling time.</td>
</tr>
<tr>
<td>total-bytes-per-sec</td>
<td>string</td>
<td>The total data transfer rate, in bytes per second, since the last sampling time.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>total-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted total-bytes-per-second value.</td>
</tr>
<tr>
<td>read-bytes-per-sec</td>
<td>string</td>
<td>The data transfer rate, in bytes per second, for read operations since the last sampling time.</td>
</tr>
<tr>
<td>read-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted read-bytes-per-second value.</td>
</tr>
<tr>
<td>write-bytes-per-sec</td>
<td>string</td>
<td>Data transfer rate, in bytes per second, for write operations since the last sampling time.</td>
</tr>
<tr>
<td>write-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted write-bytes-per-second value.</td>
</tr>
<tr>
<td>number-of-allocated-pages</td>
<td>uint64</td>
<td>The number of 4-MB pages allocated to volumes in the pool.</td>
</tr>
<tr>
<td>number-of-pages-copied</td>
<td>uint64</td>
<td>The number of pages copied to read cache in the sample time period.</td>
</tr>
<tr>
<td>number-of-pages-discarded</td>
<td>uint64</td>
<td>The number of pages discarded from read cache (to make room for new hot data) in the sample time period.</td>
</tr>
<tr>
<td>sample-time</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds, when the data sample was taken.</td>
</tr>
<tr>
<td>sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted sample-time value.</td>
</tr>
</tbody>
</table>

**redundancy**

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

**Table 90. redundancy properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>redundancy-mode</td>
<td>string</td>
<td>The system's operating mode, also called the cache redundancy mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>Independent Cache Performance Mode</strong>: For a dual-controller system, controller failover is disabled and data in a controller's write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <strong>Active-Active ULP</strong>: 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.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Single Controller: The enclosure contains a single controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Failed Over: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Down: Both controllers are not operational.</td>
</tr>
<tr>
<td>redundancy-mode- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for redundancy-mode values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Independent Cache Performance Mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Active-Active ULP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Single Controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Failed Over</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: Down</td>
</tr>
<tr>
<td>redundancy-status</td>
<td>string</td>
<td>• Redundant with independent cache: Both controllers are operational but are not mirroring their cache metadata to each other.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Redundant: Both controllers are operational.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Down: This controller is not operational.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown: Status information is not available.</td>
</tr>
<tr>
<td>redundancy-status- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for redundancy-status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Redundant with independent cache</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Operational but not redundant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: Unknown</td>
</tr>
<tr>
<td>controller-a-status</td>
<td>string</td>
<td>• Operational: The controller is operational.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Down: The controller is installed but not operational.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Installed: The controller is not installed.</td>
</tr>
<tr>
<td>controller-a-status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller-a-status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Not Installed</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| controller-a- serial-number | string    | • Controller module serial number  
• Not Available: The controller is down or not installed. |
| controller-b- status     | string    | • Operational: The controller is operational.  
• Down: The controller is installed but not operational.  
• Not Installed: The controller is not installed. |
| controller-b- status-numeric | uint32   | Numeric equivalents for controller-b-status values.  
• 0: Operational  
• 1: Down  
• 2: Not Installed |
| controller-b- serial-number | string    | • Controller module serial number  
• Not Available: The controller is down or not installed. |
| other-MC-status          | string    | The operational status of the Management Controller in the partner controller. This is not factored into system health.  
• Not Communicating  
• Not Operational  
• Operational  
• Unknown |
| other-MC-status-numeric  | uint32    | Numeric equivalents for other-mc-status values.  
• 1524: Not Communicating  
• 3231: Not Operational  
• 4749: Operational  
• 1496: Unknown |

**refresh-counters**

This basetype is used by `show refresh-counters`.

**Table 91. refresh-counters properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| basetype-name  | (Not shown)| Shows when the data represented by the base type was last updated.  
• 0: The data has never been updated and is not cached.  
• nonzero-number: A timestamp indicating that the data has been updated. If the value has changed since the last time you called this command then the data has changed. |
remote-ports

This basetype is used by `show peer-connections`.

**Table 92. remote-ports properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>remote-host-port</td>
<td>string</td>
<td>The ID of the port in the remote system.</td>
</tr>
<tr>
<td>port-address</td>
<td>string</td>
<td>The assigned port address.</td>
</tr>
</tbody>
</table>

remote-ports-detail

This basetype is used by `show peer-connections` when the `verify-links` parameter is specified.

**Table 93. remote-ports-detail parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>remote-host-port</td>
<td>string</td>
<td>The ID of the port in the remote system.</td>
</tr>
<tr>
<td>port-address</td>
<td>string</td>
<td>The assigned port address.</td>
</tr>
<tr>
<td>local-links</td>
<td>string</td>
<td>The IDs of linked ports in the local system.</td>
</tr>
</tbody>
</table>

remote-system

This basetype is used by `show remote-systems`.

**Table 94. remote-system properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>string</td>
<td>Remote system ID.</td>
</tr>
<tr>
<td>system-name</td>
<td>string</td>
<td>• The name of the remote system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Uninitialized Name: The default value.</td>
</tr>
<tr>
<td>system-contact</td>
<td>string</td>
<td>• The name of the person who administers the remote system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Uninitialized Contact: The default value.</td>
</tr>
<tr>
<td>system-location</td>
<td>string</td>
<td>• The location of the remote system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Uninitialized Location: The default value.</td>
</tr>
<tr>
<td>system-information</td>
<td>string</td>
<td>• A brief description of the remote system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Uninitialized Info: The default value.</td>
</tr>
<tr>
<td>vendor-name</td>
<td>string</td>
<td>The vendor name of the remote system.</td>
</tr>
<tr>
<td>product-id</td>
<td>string</td>
<td>The product model identifier of the remote system.</td>
</tr>
<tr>
<td>product-brand</td>
<td>string</td>
<td>The brand name of the remote system.</td>
</tr>
<tr>
<td>Field</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| ip-address-a        | string      | The IP address of the network port in controller A in the remote system.  
|                     |             | • The IP address of the network port in controller A in the remote system.  
|                     |             | • Not Present                                                                                                                                |
| ip-address-b        | string      | The IP address of the network port in controller B in the remote system.  
|                     |             | • The IP address of the network port in controller B in the remote system.  
|                     |             | • Not Present                                                                                                                                |
| username            | string      | The name of a user that is configured in the remote system. This must be a user with the manage role to remotely configure or provision that system. |
| status              | string      | • Uninitialized: This system hasn't communicated with the remote system.  
|                     |             | • Ready: This system has contacted the remote system and it is ready to use.  
|                     |             | • Connected: This system is transferring data to the remote system.  
|                     |             | • Not Connected: The system is not connected to the remote system.                                                                       |
| status-numeric      | uint32      | Numeric equivalents for status values.  
|                     |             | • 0: Uninitialized  
|                     |             | • 1: Ready  
|                     |             | • 2: Connected |
| last-connected      | string      | Date and time, in the format year-month-day hour:minutes:seconds (UTC), when successful communication was last established between the Management Controller in the local system and the Management Controller in the remote system. This value does not indicate when connection status was last determined, and will not be updated if the remote Management Controller is not accessible or if the connection status is Not Connected. |
| interfaces          | string      |  
|                     |             | • FC  
|                     |             | • iSCSI  
|                     |             | • SAS  
|                     |             | • Hybrid: FC and iSCSI |
| interfaces-numeric  | uint32      | Numeric equivalents for interfaces values.  
|                     |             | • 0: FC  
|                     |             | • 1: iSCSI  
|                     |             | • 2: SAS  
|                     |             | • 3: Hybrid |
| storage-model       | string      |  
|                     |             | • LINEAR |
| storage-model-numeric | uint32   | Numeric equivalents for storage-model values.  
|                     |             | • 0: LINEAR |
### isvalid-ip-a

- **string**

- **Description:**
  - **False:** The IP address is not valid for controller module A in the remote system.
  - **True:** The IP address is valid for controller module A in the remote system.

| **isvalid-ip-a- numeric** | **uint32** | Numeric equivalents for isvalid-ip-a values.
|--------------------------|-----------|----------------------------------------
|                          |           | - 0: False
|                          |           | - 1: True

### isvalid-ip-b

- **string**

- **Description:**
  - **False:** The IP address is not valid for controller B in the remote system.
  - **True:** The IP address is valid for controller B in the remote system.

| **isvalid-ip-b- numeric** | **uint32** | Numeric equivalents for isvalid-ip-b values.
|--------------------------|-----------|----------------------------------------
|                          |           | - 0: False
|                          |           | - 1: True

### replication-snapshot-history

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

<table>
<thead>
<tr>
<th><strong>Table 95. replication-snapshot-history properties</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
</tr>
<tr>
<td>name</td>
</tr>
<tr>
<td>serial-number</td>
</tr>
<tr>
<td>snapshot-history</td>
</tr>
<tr>
<td>snapshot-count</td>
</tr>
<tr>
<td>snapshot-basename</td>
</tr>
</tbody>
</table>
retention-priority

**Description**
The retention priority for snapshots, which is used when automatic deletion of snapshots is enabled by using the set snapshot-space command. In a snapshot tree, only leaf snapshots can be deleted automatically. Deletion based on retention priority is unrelated to deleting the oldest snapshots to maintain a snapshot count.

- **never-delete**: Snapshots will never be deleted automatically to make space. The oldest snapshot in the snapshot history will be deleted once the snapshot-count value has been exceeded.
- **high**: Snapshots can be deleted after all eligible medium-priority snapshots have been deleted.
- **medium**: Snapshots can be deleted after all eligible low-priority snapshots have been deleted.
- **low**: Snapshots can be deleted.

retention-priority-numeric

**Type**
uint32

**Description**
Numeric equivalents for retention-priority-numeric values.

- **0**: never-delete
- **1**: low
- **2**: medium
- **3**: high

reset-snapshot-tasks

This basetype is used by show tasks for a ResetSnapshot task.

**Table 96. reset-snapshot-tasks properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>snapshot-name</td>
<td>string</td>
<td>Name of the snapshot to reset.</td>
</tr>
<tr>
<td>snapshot-serial</td>
<td>string</td>
<td>Serial number of the snapshot to reset.</td>
</tr>
</tbody>
</table>

resettable-statistics

This basetype is used by show pool-statistics and show tier-statistics.

**Table 97. resettable-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the pool or tier.</td>
</tr>
<tr>
<td>time-since-reset</td>
<td>uint32</td>
<td>The amount of time, in seconds, since these statistics were last reset, either by a user or by a controller restart.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>time-since-sample</td>
<td>uint32</td>
<td>The amount of time, in milliseconds, since this set of statistics was last sampled by the Storage Controller.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>The number of read operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>The number of write operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>The amount of data read since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>Unformatted data-read value.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>The amount of data written since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>Unformatted data-written value.</td>
</tr>
<tr>
<td>bytes-per-second</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>bytes-per-second-numeric</td>
<td>uint64</td>
<td>Unformatted bytes-per-second value.</td>
</tr>
<tr>
<td>iops</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>avg-rsp-time</td>
<td>uint32</td>
<td>The average response time, in microseconds, for read and write operations since the last sampling time.</td>
</tr>
<tr>
<td>avg-read-rsp-time</td>
<td>uint32</td>
<td>The average response time, in microseconds, for read operations since the last sampling time.</td>
</tr>
<tr>
<td>avg-write-rsp-time</td>
<td>uint32</td>
<td>The average response time, in microseconds, for write operations since the last sampling time.</td>
</tr>
</tbody>
</table>

**sas-host-phy-statistics**

This basetype is used by show host-phy-statistics.

Table 98. sas-host-phy-statistics properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>port</td>
<td>string</td>
<td>The controller ID and port number.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>phy</td>
<td>uint32</td>
<td>The 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.</td>
</tr>
<tr>
<td>disparity-errors</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>lost-dwords</td>
<td>uint32</td>
<td>The number of times the PHY has lost doubleword synchronization and restarted the Link Reset sequence.</td>
</tr>
<tr>
<td>invalid-dwords</td>
<td>uint32</td>
<td>The number of invalid doublewords that have been received by the PHY, not including those received during Link Reset sequences.</td>
</tr>
<tr>
<td>reset-error-counter</td>
<td>uint32</td>
<td>The number of times the PHY Reset sequence has failed.</td>
</tr>
</tbody>
</table>

**sas-port**

This basetype is used by `show ports` for a SAS host port.

**Table 99. sas-port properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>configured-topology</td>
<td>string</td>
<td>1. • Direct</td>
</tr>
<tr>
<td>width</td>
<td>uint8</td>
<td>Number of PHY lanes in the SAS port.</td>
</tr>
<tr>
<td>sas-lanes-expected</td>
<td>uint8</td>
<td>Expected number of PHY lanes in the SAS port.</td>
</tr>
<tr>
<td>sas-active-lanes</td>
<td>uint8</td>
<td>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.</td>
</tr>
<tr>
<td>sas-disabled-lanes</td>
<td>uint8</td>
<td>Number of disabled lanes in the SAS port.</td>
</tr>
</tbody>
</table>

**sas-status-controller-a**

This basetype is used by `show expander-status` for controller A and controller B.

**Table 100. sas-status-controller-a properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>drawer-id</td>
<td>uint8</td>
<td></td>
</tr>
<tr>
<td>(5U84 enclosure)</td>
<td></td>
<td>0: Top</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Bottom</td>
</tr>
<tr>
<td>drawer-id</td>
<td>uint8</td>
<td></td>
</tr>
<tr>
<td>(2U12/24 enclosure)</td>
<td></td>
<td>Not applicable (255).</td>
</tr>
<tr>
<td>expander-id</td>
<td>uint8</td>
<td>Expander ID.</td>
</tr>
<tr>
<td>controller</td>
<td>string</td>
<td>A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B: Controller B.</td>
</tr>
<tr>
<td>controller-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for controller values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: A</td>
</tr>
<tr>
<td>wide-port-index</td>
<td>uint32</td>
<td>The wide-port index.</td>
</tr>
<tr>
<td>phy-index</td>
<td>uint32</td>
<td>The PHY index.</td>
</tr>
<tr>
<td>wide-port-role</td>
<td>string</td>
<td>The wide-port role.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drawer Egress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drawer Ingress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expansion Egress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expansion Ingress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC Primary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC Alternate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inter Expander</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unused</td>
</tr>
<tr>
<td>wide-port-role-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for wide-port-role values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2: Drawer Egress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3: Drawer Ingress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4: Expansion Egress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5: Expansion Ingress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6: SC Primary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7: SC Alternate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8: Inter Expander</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9: Unused</td>
</tr>
<tr>
<td>wide-port-num</td>
<td>uint32</td>
<td>The wide-port number.</td>
</tr>
<tr>
<td>type</td>
<td>string</td>
<td>The PHY type.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drawer0-Egress: Drawer 0 egress PHY.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drawer0-Ingress: Drawer 0 ingress PHY.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Drawer1-Egress</td>
<td></td>
<td>Drawer 1 egress PHY.</td>
</tr>
<tr>
<td>Drawer1-Ingress</td>
<td></td>
<td>Drawer 1 ingress PHY.</td>
</tr>
<tr>
<td>Drawer2-Egress</td>
<td></td>
<td>Drawer 2 egress PHY.</td>
</tr>
<tr>
<td>Drawer2-Ingress</td>
<td></td>
<td>Drawer 2 ingress PHY.</td>
</tr>
<tr>
<td>Drive</td>
<td></td>
<td>Drive slot PHY.</td>
</tr>
<tr>
<td>Egress</td>
<td></td>
<td>Expansion port egress PHY.</td>
</tr>
<tr>
<td>Expander-Egress-0</td>
<td></td>
<td>Expansion port 0 egress PHY.</td>
</tr>
<tr>
<td>Expander-Egress-1</td>
<td></td>
<td>Expansion port 1 egress PHY.</td>
</tr>
<tr>
<td>Expander-Ingress-0</td>
<td></td>
<td>Expansion port 0 ingress PHY.</td>
</tr>
<tr>
<td>Expander-Ingress-1</td>
<td></td>
<td>Expansion port 1 ingress PHY.</td>
</tr>
<tr>
<td>Ingress</td>
<td></td>
<td>Expansion port ingress PHY.</td>
</tr>
<tr>
<td>Inter-Exp</td>
<td></td>
<td>Inter-expander PHY.</td>
</tr>
<tr>
<td>SC</td>
<td></td>
<td>Storage Controller PHY.</td>
</tr>
<tr>
<td>SC-0</td>
<td></td>
<td>Storage Controller primary PHY.</td>
</tr>
<tr>
<td>SC-1</td>
<td></td>
<td>Storage Controller alternate PHY.</td>
</tr>
<tr>
<td>SC-A</td>
<td></td>
<td>Storage Controller alternate PHY.</td>
</tr>
<tr>
<td>SC-P</td>
<td></td>
<td>Storage Controller primary PHY.</td>
</tr>
<tr>
<td>SCA-A</td>
<td></td>
<td>Storage Controller A alternate PHY.</td>
</tr>
<tr>
<td>SCA-P</td>
<td></td>
<td>Storage Controller A primary PHY.</td>
</tr>
<tr>
<td>SCB-A</td>
<td></td>
<td>Storage Controller B alternate PHY.</td>
</tr>
<tr>
<td>SCB-P</td>
<td></td>
<td>Storage Controller B primary PHY.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>PHY status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Unavailable: No status information is available.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled - Healthy: The PHY is enabled and healthy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled - Degraded: The PHY is enabled but degraded.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disabled: The PHY has been disabled by a user or by the system.</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Unavailable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Enabled - Healthy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: Enabled - Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: Disabled</td>
</tr>
<tr>
<td>elem-status</td>
<td>string</td>
<td>The SES status that corresponds to the PHY status.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>elem-status- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>elem-status</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Disabled</td>
</tr>
<tr>
<td>elem-disabled</td>
<td>string</td>
<td>• Enabled: PHY is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: PHY is disabled.</td>
</tr>
<tr>
<td>elem-disabled- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>elem-disabled</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Enabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Disabled</td>
</tr>
<tr>
<td>elem-reason</td>
<td>string</td>
<td>More information about the status value.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blank if <code>elem-status</code> is OK.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Error count interrupts: PHY disabled because of error-count interrupts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PHY control: PHY disabled by a SES control page as a result of action by a Storage Controller or user.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not ready: PHY is enabled but not ready. Appears for SC-1 PHYs when the</td>
</tr>
</tbody>
</table>

**Description**

- **Disabled**: Critical condition is detected.
- **Error**: Unrecoverable condition is detected. Appears only if there is a firmware problem related to PHY definition data.
- **OK**: Element is installed and no error conditions are known.
- **Non-critical**: Non-critical condition is detected.
- **Not Used**: Element is not installed in enclosure.
- **Unknown**: Either:
  - Sensor has failed or element status is not available. Appears only if an I/O module indicates it has fewer PHYs than the reporting I/O module, in which case all additional PHYs are reported as unknown.
  - Element is installed with no known errors, but the element has not been turned on or set into operation.
  - SES status cannot be determined for another reason.
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>partner I/O module</td>
<td></td>
<td>Not installed. Appears for Drive, SC-1, or Ingress PHYs when a connection problem exists such as a broken connector.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disk removed: PHY disabled because drive slot is empty.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unused - disabled by default: PHY is disabled by default because it is not used.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Excessive PHY changes: PHY is disabled because of excessive PHY change counts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Did not initialize: PHY is enabled but not ready because it did not pass COMINIT.</td>
</tr>
<tr>
<td>elem-reason- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for elem-reason values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0 : (blank)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Error count interrupts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: PHY control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: Not ready</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8: Disk removed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 9: Unused - disabled by default</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 10: Excessive PHY changes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 11: Did not initialize</td>
</tr>
<tr>
<td>change-counter</td>
<td>hex32</td>
<td>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.</td>
</tr>
<tr>
<td>code-violations</td>
<td>hex32</td>
<td>Number of times the PHY received an unrecognized or unexpected signal.</td>
</tr>
<tr>
<td>disparity-errors</td>
<td>hex32</td>
<td>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 don't alternate.</td>
</tr>
<tr>
<td>crc-errors</td>
<td>hex32</td>
<td>In a sequence of SAS transfers (frames), the data is protected by a cyclic redundancy check (CRC) value. The crc-errors value specifies the number of times the computed CRC does not match the CRC stored in the frame, which indicates that the frame might have been corrupted in transit.</td>
</tr>
<tr>
<td>conn-crc-errors</td>
<td>hex32</td>
<td>Number of times the lane between two expanders experienced a communication error.</td>
</tr>
</tbody>
</table>

406  API basetype properties
### lost-dwords
- **Type**: hex32
- **Description**: Number of times the PHY has lost doubleword synchronization and restarted the Link Reset sequence.

### invalid-dwords
- **Type**: hex32
- **Description**: Number of invalid doublewords that have been received by the PHY, not including those received during Link Reset sequences.

### reset-error-counter
- **Type**: hex32
- **Description**: Number of times the expander performed a reset of error counters.

### flag-bits
- **Type**: hex32
- **Description**: PHY status flag bits, for internal use.

### sas-status-drawer
This basetype is used by `show expander-status` and has the same properties as `sas-status-controller-a`.

### schedules
This basetype is used by `show schedules`.

#### Table 101. schedules properties

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

API basetype properties
Table 102. security-communications-protocols properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>wbi-http</td>
<td>string</td>
<td>• Disabled: The standard MESM web server is disabled. • Enabled: The standard MESM web server is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled • 1: Enabled</td>
</tr>
<tr>
<td>wbi-https</td>
<td>string</td>
<td>• Disabled: The secure MESM web server is disabled. • Enabled: The secure MESM web server is enabled.</td>
</tr>
<tr>
<td>wbi-https-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for wbi-https values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled • 1: Enabled</td>
</tr>
<tr>
<td>cli-telnet</td>
<td>string</td>
<td>• Disabled: The standard CLI is disabled. • Enabled: The standard CLI is enabled.</td>
</tr>
<tr>
<td>cli-telnet-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cli-telnet values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled • 1: Enabled</td>
</tr>
<tr>
<td>cli-ssh</td>
<td>string</td>
<td>• Disabled: The secure shell CLI is disabled. • Enabled: The secure shell CLI is enabled.</td>
</tr>
<tr>
<td>cli-ssh-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cli-ssh values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled • 1: Enabled</td>
</tr>
<tr>
<td>smis</td>
<td>string</td>
<td>• Disabled: The secure SMI-S interface is disabled. • Enabled: The secure SMI-S interface is enabled. This option allows SMI-S clients to communicate with each controller's embedded SMI-S provider via HTTP port 5989.</td>
</tr>
<tr>
<td>smis-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for smis values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled • 1: Enabled</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>--------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| usmis        | string | • Disabled: The unsecure SMI-S interface is disabled.  
                  • Enabled: The unsecure SMI-S interface is enabled. This option allows SMI-S clients to communicate with each controller's embedded SMI-S provider via HTTP port 5988. |
| usmis-numeric| uint32 | Numeric equivalents for `smis` values.  
                  • 0: Disabled  
                  • 1: Enabled |
| slp          | string | • Disabled: The SLP interface is disabled.  
                  • Enabled: The SLP interface is enabled. |
| slp-numeric  | uint32 | Numeric equivalents for `slp` values.  
                  • 0: Disabled  
                  • 1: Enabled |
| ftp          | string | • Disabled: The FTP interface is disabled.  
                  • Enabled: The FTP interface is enabled. |
| ftp-numeric  | uint32 | Numeric equivalents for `ftp` values.  
                  • 0: Disabled  
                  • 1: Enabled |
| sftp         | string | • Disabled: The SFTP interface is disabled.  
                  • Enabled: The SFTP interface is enabled. |
| sftp-numeric | uint32 | Numeric equivalents for `sftp` values.  
                  • 0: Disabled  
                  • 1: Enabled |
| snmp         | string | • Disabled: The SNMP interface is disabled. All SNMP requests to the MIB are disabled and SNMP traps are disabled.  
                  • Enabled: The SNMP interface is enabled. |
| snmp-numeric | uint32 | Numeric equivalents for `snmp` values.  
                  • 0: Disabled  
                  • 1: Enabled |
| debug-interface | string | • Disabled: The Telnet debug port is disabled.  
                  • Enabled: The Telnet debug port is enabled. |
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>debug-interface- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for debug-interface values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>inband-ses</td>
<td>string</td>
<td>• Disabled: The in-band SES interface is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enabled: The in-band SES interface is enabled.</td>
</tr>
<tr>
<td>inband-ses-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for inband-ses values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
<tr>
<td>activity-progress</td>
<td>string</td>
<td>• Enabled: Access to the activity progress interface via HTTP port 8081 is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Access to the activity progress interface via HTTP port 8081 is disabled.</td>
</tr>
<tr>
<td>management-mode</td>
<td>string</td>
<td>The default management mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Linear: Uses linear-storage terminology in command output and system messages. For example, vdisk for disk groups and pools.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Virtual: Uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, disk group for disk groups and pool for pools.</td>
</tr>
<tr>
<td>management-mode- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for management-mode values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Linear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Virtual</td>
</tr>
<tr>
<td>activity-progress- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for activity-progress values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Enabled</td>
</tr>
</tbody>
</table>
sensors

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

### Table 103. sensors properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Sensor ID.</td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
<tr>
<td>drawer-id (5U84 enclosure)</td>
<td>uint8</td>
<td>• 0: Top</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Bottom</td>
</tr>
<tr>
<td>drawer-id (2U12/24 enclosure)</td>
<td>uint8</td>
<td>Not applicable (255).</td>
</tr>
<tr>
<td>controller-id</td>
<td>string</td>
<td>• A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• B: Controller B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• both: Both controllers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A</td>
</tr>
<tr>
<td>controller-id- numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>controller-id</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: both</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A</td>
</tr>
<tr>
<td>sensor-name</td>
<td>string</td>
<td>Sensor name and location.</td>
</tr>
<tr>
<td>value</td>
<td>string</td>
<td>• For a sensor, its value.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For overall unit status, one of the status values below.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>• OK: The sensor is present and detects no error condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warning: The sensor detected a non-critical error condition. Temperature, voltage, or current is between the warning and critical thresholds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Critical: The sensor detected a critical error condition. Temperature, voltage, or current exceeds the critical threshold.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unrecoverable: The enclosure management processor (EMP) cannot communicate with the sensor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown: The sensor is present but status is not available.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Installed: The sensor is not present.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Unsupported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Critical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Unrecoverable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: Not Installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7: Unavailable</td>
</tr>
<tr>
<td>sensor-location</td>
<td>uint32</td>
<td>Superseded by the container property.</td>
</tr>
<tr>
<td>container</td>
<td>string</td>
<td>Hardware component that contains the sensor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• controllers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• enclosures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• fan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• icom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• midplane</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• power-supplies</td>
</tr>
<tr>
<td>container-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for container values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 17: enclosures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 18: midplane</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 19: controllers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 20: icom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 21: power-supplies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 22: fan</td>
</tr>
<tr>
<td>sensor-type</td>
<td>string</td>
<td>• Temperature</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Current</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Charge Capacity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown Type</td>
</tr>
<tr>
<td>sensor-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for sensor-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Temperature</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Current</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Charge capacity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Unknown Type</td>
</tr>
</tbody>
</table>
**service-tag-info**

This basetype is used by `show service-tag-info`.

**Table 104. service-tag-info properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>service-tag</td>
<td>string</td>
<td>An alphanumeric string that uniquely identifies the product.</td>
</tr>
</tbody>
</table>

**sessions**

This basetype is used by `show sessions`.

**Table 105. sessions properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>username</td>
<td>string</td>
<td>The name of the user for which session information is shown.</td>
</tr>
<tr>
<td>interface</td>
<td>string</td>
<td>Shows whether the session is using the CLI or the MESM.</td>
</tr>
<tr>
<td>management-mode</td>
<td>string</td>
<td>The management mode used in the session.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Linear: Uses linear-storage terminology in command output and system messages. For example, <code>vdisk</code> for disk groups and pools.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Virtual: Enables access to virtual replication commands and uses terminology in command output and system messages that is generalized for managing virtual and linear storage. For example, <code>disk group</code> for disk groups and <code>pool</code> for pools.</td>
</tr>
<tr>
<td>management-mode-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for management-mode values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Linear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Virtual</td>
</tr>
<tr>
<td>locale</td>
<td>string</td>
<td>The display language.</td>
</tr>
<tr>
<td>locale-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for locale values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: English</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Spanish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: French</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8: Korean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: German</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7: Japanese</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 11: Chinese-simplified</td>
</tr>
<tr>
<td>host</td>
<td>string</td>
<td>For a CLI session, the connected system’s IP address and port number.</td>
</tr>
<tr>
<td>state</td>
<td>uint32</td>
<td>• Active</td>
</tr>
</tbody>
</table>
### Table 106. show-other-MC-status properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>other-MC</td>
<td>string</td>
<td>Other MC Status</td>
</tr>
<tr>
<td>other-MC-status</td>
<td>string</td>
<td>The operational status of the Management Controller in the partner controller. This is not factored into system health.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Not Communicating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Not Operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Unknown</td>
</tr>
<tr>
<td>other-MC-status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for other-mc-status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1524: Not Communicating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3231: Not Operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 4749: Operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1496: Unknown</td>
</tr>
</tbody>
</table>
shutdown-status

This basetype is used by show shutdown-status.

Table 107. shutdown-status properties

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

sideplanes

This basetype is used by show enclosures.

Table 108. sideplanes properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Sideplane ID.</td>
</tr>
<tr>
<td>enclosure-id</td>
<td>uint32</td>
<td>Enclosure ID.</td>
</tr>
</tbody>
</table>
| drawer-id                 | uint8   | • 0: Top  
              |         | • 1: Bottom                                                                 |
| drawer-id                 |         | (5U84 enclosure)                                                            |
| drawer-id                 | uint8   | Not applicable (255).                                                      |
| (2U12/24 enclosure)       |         |                                                                              |
| 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  
<pre><code>          |         | • 1: A |
</code></pre>
<p>| name                      | string  | Sideplane name.                                                             |
| location                  | string  | Sideplane location.                                                         |
| position                  | string  | Sideplane position, as viewed from the front of the enclosure.               |</p>
<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>position-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for position values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Left</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Right</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Sideplane status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unsupported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Critical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unrecoverable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Not Installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unavailable</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Unsupported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Critical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Unrecoverable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: Not Installed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7: Unavailable</td>
</tr>
<tr>
<td>extended-status</td>
<td>hex32</td>
<td>A numeric value that supplements the standard SES status shown by the status</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and status-numeric properties, and represents a specific condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x01 : Not powered</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x02 : Cable fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x03 : Other fault</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unknown</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: N/A</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended action to take to resolve the health issue.</td>
</tr>
</tbody>
</table>
**unhealthy-component**

Embedded; see *unhealthy-component*.

**expander-details**

Embedded; see *expanders*.

---

**snap-space**

This basetype is used by `show snapshot-space`.

**Table 109. snap-space properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pool</td>
<td>string</td>
<td>The pool for which information is displayed (A or B).</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the pool.</td>
</tr>
<tr>
<td>snap-limit-threshold</td>
<td>string</td>
<td>The percentage of the pool that can be used for snapshots (the snapshot space).</td>
</tr>
<tr>
<td>snap-limit-size</td>
<td>string</td>
<td>The actual size of the snapshot space.</td>
</tr>
<tr>
<td>snap-limit-size-numeric</td>
<td>uint64</td>
<td>Numeric equivalents for <code>snap-limit-size</code> values.</td>
</tr>
<tr>
<td>allocated-percent-pool</td>
<td>string</td>
<td>The percentage of the pool currently used by snapshots.</td>
</tr>
<tr>
<td>allocated-percent-snapspace</td>
<td>string</td>
<td>The percentage of the snapshot space currently used by snapshots.</td>
</tr>
<tr>
<td>allocated-size</td>
<td>string</td>
<td>The actual amount of space currently used by snapshots.</td>
</tr>
<tr>
<td>allocated-size-numeric</td>
<td>uint64</td>
<td>Numeric equivalents for <code>allocated-size</code> values.</td>
</tr>
<tr>
<td>snap-low-threshold</td>
<td>string</td>
<td>A percentage of the snapshot space designated as the low threshold.</td>
</tr>
<tr>
<td>snap-middle-threshold</td>
<td>string</td>
<td>A percentage of the snapshot space designated as the middle threshold.</td>
</tr>
<tr>
<td>snap-high-threshold</td>
<td>string</td>
<td>A percentage of the snapshot space designated as the high threshold.</td>
</tr>
<tr>
<td>limit-policy</td>
<td>string</td>
<td>The limit policy for when the percentage of the pool designated for snapshots is reached.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>notify-only</code>: When the snapshot space is reached an event is generated and logged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>delete</code>: When the snapshot space is reached an event is generated and logged and automatic deletion of snapshots occurs.</td>
</tr>
<tr>
<td>limit-policy-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>limit-policy</code> values.</td>
</tr>
</tbody>
</table>
snapshots

This basetype is used by `show snapshots`.

**Table 110. snapshots properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Snapshot ID.</td>
</tr>
<tr>
<td>virtual-disk-name</td>
<td>string</td>
<td>The name of the disk group or pool that contains the snapshot.</td>
</tr>
<tr>
<td>storage-pool-name</td>
<td>string</td>
<td>The name of the disk group or pool that contains the snapshot.</td>
</tr>
<tr>
<td>storage-pools-url</td>
<td>string</td>
<td>Pool URL.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Snapshot serial number.</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>Snapshot name.</td>
</tr>
<tr>
<td>url</td>
<td>string</td>
<td>Snapshot URL.</td>
</tr>
<tr>
<td>creation-date-time</td>
<td>string</td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds</code> (UTC), when the snapshot was prepared or committed.</td>
</tr>
<tr>
<td>creation-date-time-numeric</td>
<td>uint32</td>
<td>Unformatted <code>creation-date-time</code> value.</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Snapshot status.</td>
</tr>
</tbody>
</table>
| status-numeric     | uint32     | • 0: Available  
• Nonzero: Unavailable                                                  |
<p>| status-reason      | string     | Shows N/A for Available status, or one of the following reasons for Unavailable status: |
| status-reason-numeric | uint32 | Numeric equivalents for <code>status-reason</code> values.                             |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>master-volume-name</td>
<td>string</td>
<td>Name of the volume of which the snapshot was taken.</td>
</tr>
<tr>
<td>volume-parent</td>
<td>string</td>
<td>The name of the volume of which the snapshot was taken.</td>
</tr>
<tr>
<td>base-volume</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>base-serial-number</td>
<td>string</td>
<td>The serial number of the base volume.</td>
</tr>
<tr>
<td>num-children</td>
<td>uint32</td>
<td>The number of child snapshots (snapshots taken of this snapshot).</td>
</tr>
<tr>
<td>num-snaps-tree</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>snap-pool-name</td>
<td>string</td>
<td>- The name of the snap pool for linear snapshots.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Blank for virtual snapshots.</td>
</tr>
<tr>
<td>snap-data</td>
<td>string</td>
<td>The total amount of write data associated with the snapshot.</td>
</tr>
<tr>
<td>snap-data-numeric</td>
<td>uint64</td>
<td>Unformatted <code>snap-data</code> value in blocks.</td>
</tr>
<tr>
<td>uniquedata</td>
<td>string</td>
<td>The amount of write data that is unique to the snapshot.</td>
</tr>
<tr>
<td>uniquedata-numeric</td>
<td>uint64</td>
<td>Unformatted <code>uniquedata</code> value in blocks.</td>
</tr>
<tr>
<td>shareddata</td>
<td>string</td>
<td>The amount of write data that is shared between this snapshot and other snapshots.</td>
</tr>
<tr>
<td>shareddata-numeric</td>
<td>uint64</td>
<td>Unformatted <code>shareddata</code> value in blocks.</td>
</tr>
<tr>
<td>retention-priority</td>
<td>string</td>
<td>The retention priority for the snapshot.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <code>never-delete</code>: Snapshots will never be deleted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <code>high</code>: Snapshots may be deleted after all eligible medium-priority snapshots have been deleted.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>retention-priority-numeric</td>
<td>uint64</td>
<td>Numeric equivalents for retention-priority values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: never-delete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: high</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: low</td>
</tr>
<tr>
<td>priority-value</td>
<td>string</td>
<td>Retention priority for the snapshot, based on the snapshot attributes and the user-defined retention priority for the snapshot type.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x6000: Standard snapshot.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0xa000: Volume-copy snapshot.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Snapshot that is being used to copy data from a source volume to a destination volume.</td>
</tr>
<tr>
<td>user_priority-value</td>
<td>string</td>
<td>User-defined retention priority for the snapshot type.</td>
</tr>
<tr>
<td>snapshot-type</td>
<td>string</td>
<td>Snapshot type.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Standard snapshot: Snapshot of a source volume that consumes a snapshot license.</td>
</tr>
<tr>
<td>snapshot-type-numeric</td>
<td>uint64</td>
<td>Numeric equivalents for snapshot-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00004000: Standard snapshot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0x00000000: N/A</td>
</tr>
<tr>
<td>storage-type</td>
<td>string</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Linear: Linear pool.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Virtual: Virtual pool.</td>
</tr>
<tr>
<td>storage-type-numeric</td>
<td>uint64</td>
<td>Numeric equivalents for storage-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Linear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Virtual</td>
</tr>
<tr>
<td>total-size</td>
<td>string</td>
<td>The total size of the snapshot.</td>
</tr>
<tr>
<td>total-size-numeric</td>
<td>uint64</td>
<td>Unformatted total-size value in blocks.</td>
</tr>
</tbody>
</table>
## snapshot-with-retention-tasks

This basetype is used by `show tasks` for a `TakeSnapshot` task.

### Table 111. snapshot-with-retention-tasks properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>master-volume-name</td>
<td>string</td>
<td>Source volume name.</td>
</tr>
<tr>
<td>master-volume-serial</td>
<td>string</td>
<td>Source volume serial number.</td>
</tr>
<tr>
<td>snapshot-prefix</td>
<td>string</td>
<td>A label to identify snapshots created by this task.</td>
</tr>
<tr>
<td>retention-count</td>
<td>uint32</td>
<td>Number of snapshots to retain with this prefix. When a new snapshot exceeds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>this limit, the oldest snapshot with the same prefix is deleted.</td>
</tr>
<tr>
<td>last-created</td>
<td>string</td>
<td>- The name of the last snapshot created by the task.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Blank if the task has not created a snapshot.</td>
</tr>
<tr>
<td>snapshot</td>
<td>Embedded; see snap-tasks.</td>
<td></td>
</tr>
</tbody>
</table>

## snap-tasks

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

### Table 112. snap-tasks properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>snapshot-name</td>
<td>string</td>
<td>Snapshot name.</td>
</tr>
<tr>
<td>snapshot-serial</td>
<td>string</td>
<td>Snapshot serial number.</td>
</tr>
</tbody>
</table>

## snmp-parameters

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

### Table 113. snmp-parameters properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>snmp-enabled</td>
<td>string</td>
<td>Shows whether the Simple Network Management Protocol (SNMP) interface is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>enabled or disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Disabled: SNMP is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled: SNMP is enabled.</td>
</tr>
<tr>
<td>snmp-enabled-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>snmp-enabled</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Enabled</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>snmp-filter</td>
<td>string</td>
<td>Minimum level of events to include for SNMP traps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- crit: Sends notifications for Critical events only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- error: Sends notifications for Error and Critical events.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- warn: Sends notifications for Warning, Error, and Critical events.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- resolved: Sends notifications for Resolved, Warning, Error, and Critical events.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- info: Sends notifications for all events</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- none: No events are sent as traps and traps are disabled.</td>
</tr>
<tr>
<td>snmp-filter-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for snmp-filter values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: info</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: resolved</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: warn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 4: crit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 5: none</td>
</tr>
<tr>
<td>snmp-trap-host-1</td>
<td>string</td>
<td>Trap host IP address.</td>
</tr>
<tr>
<td>snmp-trap-host-2</td>
<td>string</td>
<td>Trap host IP address.</td>
</tr>
<tr>
<td>snmp-trap-host-3</td>
<td>string</td>
<td>Trap host IP address.</td>
</tr>
<tr>
<td>snmp-read-community</td>
<td>string</td>
<td>The community string for read-only access.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The value is obscured for users having only the monitor role and is shown in clear text for users having the manage role.</td>
</tr>
<tr>
<td>snmp-write-community</td>
<td>string</td>
<td>The community string for write access.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The value is obscured for users having only the monitor role and is shown in clear text for users having the manage role.</td>
</tr>
</tbody>
</table>

**status**

This basetype is used by all commands except `exit`, `help`, and `meta`. (`exit` does not provide a response; `help` always prints text; `meta` does not use the statusobject.)

**Table 114. status properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>response-type</td>
<td>string</td>
<td>• Success: The command succeeded.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Error: The command failed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Info: The command returned an informational message.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Warning: The command returned a warning message.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| response-type-numeric       | uint32   | • 0: Success  
• 1: Error  
• 2: Info  
• 3: Warning                                                                 |
| response                    | string   | A message stating what the command accomplished, why the command failed, or information about the command's progress. |
| return-code                 | sint32   | • 0: The command completed.  
• nnnnn: The command failed.                                                                 |
| component-id                | string   | Not used.                                                                    |
| time-stamp                  | string   | Date and time, in the format `year-month-day hour:minutes:seconds` (UTC), when the command was issued. |
| time-stamp-numeric          | uint32   | Unformatted time-stamp value.                                                |

### support-assist

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

**Table 115. support-assist properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| support-assist-state        | string   | The current state of SupportAssist:  
• Disabled  
• Running  
• Paused                                                                 |
| support-assist-state-numeric| uint32   | Numeric equivalents for support-assist-state values:  
• 0: Disabled  
• 1: Running  
• 2: Paused                                                                 |
| last-logs-send-status       | string   | The status of the last SupportAssist logs upload.                             |
| last-logs-send-time         | string   | The date and time of the last SupportAssist logs upload.                      |
| last-logs-send-time-numeric | uint32   | Unformatted last-logs-send-time value.                                        |
| last-event-send-status      | string   | The status of the last SupportAssist event upload.                             |
| last-event-send-time        | string   | The date and time of the last SupportAssist event upload.                      |
| last-event-send-time-numeric| uint32   | Unformatted last-logs-send-time value.                                        |
| proxy-information          | Embedded; see `proxy-information`                                        |
| contact-information        | Embedded; see `contact-information`,                                      |
syslog-parameters

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>syslog-host</td>
<td>string</td>
<td>The IP address of the remote syslog server to use for the notifications.</td>
</tr>
<tr>
<td>syslog-notification-level</td>
<td>string</td>
<td>Shows the minimum severity for which the system sends notifications:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• crit: Sends notifications for Critical events only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• error: Sends notifications for Error and Critical events.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• warn: Sends notifications for Warning, Error, and Critical events.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• resolved: Sends notifications for Resolved, Warning, Error, and Critical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>events.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• info : Sends notifications for all events.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• none: Disables syslog notification and clears the settings.</td>
</tr>
<tr>
<td>syslog-notification-level-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>syslog-notification-level</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: info</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: resolved</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: warn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: error</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: crit</td>
</tr>
<tr>
<td>syslog-host-port</td>
<td>uint32</td>
<td>The port on which the remote syslog facility is expected to listen for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>notifications.</td>
</tr>
</tbody>
</table>

system

This basetype is used by `show configuration` and `show system`.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>system-name</td>
<td>string</td>
<td>The name of the storage system.</td>
</tr>
<tr>
<td>system-contact</td>
<td>string</td>
<td>The name of the person who administers the system.</td>
</tr>
<tr>
<td>system-location</td>
<td>string</td>
<td>The location of the system.</td>
</tr>
<tr>
<td>system-information</td>
<td>string</td>
<td>A brief description of what the system is used for or how it is configured.</td>
</tr>
<tr>
<td>midplane-serial-number</td>
<td>string</td>
<td>The serial number of the controller enclosure midplane.</td>
</tr>
<tr>
<td>vendor-name</td>
<td>string</td>
<td>The vendor name.</td>
</tr>
<tr>
<td>product-id</td>
<td>string</td>
<td>The product model identifier.</td>
</tr>
<tr>
<td>product-brand</td>
<td>string</td>
<td>The product brand name.</td>
</tr>
<tr>
<td>scsi-vendor-id</td>
<td>string</td>
<td>The vendor name returned by the SCSI INQUIRY command.</td>
</tr>
<tr>
<td>scsi-product-id</td>
<td>string</td>
<td>The product identifier returned by the SCSI INQUIRY command.</td>
</tr>
<tr>
<td>enclosure-count</td>
<td>uint32</td>
<td>The number of enclosures in the system.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| health                  | string   | • OK  
• Degraded  
• Fault  
• N/A  
• Unknown |
| health-numeric          | uint32   | Numeric equivalents for health values.  
• 0: OK  
• 1: Degraded  
• 2: Fault  
• 3: Unknown  
• 4: N/A |
| health-reason           | string   | If Health is not OK, the reason for the health state.                         |
| other-MC-status         | string   | The operational status of the Management Controller in the partner controller.  
This is not factored into system health.  
• Operational  
• Not Operational  
• Not Communicating  
• Unknown |
| other-MC-status-numeric | uint32   | Numeric equivalents for other-MC-status values.  
• 1524: Not Communicating  
• 3231: Not Operational  
• 4749: Operational  
• 1496: Unknown |
| pfuStatus               | string   | Shows whether partner firmware update is running on the system, or is idle.    |
| supported-locales       | string   | Supported display languages.                                                 |
| current-node-wwn        | string   | Storage system node World Wide Name (WWNN).                                   |
| fde-security-status     | string   | • Unsecured: The system has not been secured with a passphrase.  
• Secured: The system has been secured with a passphrase.  
• Secured, Lock Ready: The system has been secured and lock keys have been cleared. The system will become locked after the next power cycle.  
• Secured, Locked: The system is secured and the disks are locked to data access, preventing their use. |
| fde-security-status-numeric | uint32 | Numeric equivalents for fde-security-status values.  
• 1: Unsecured  
• 2: Secured  
• 3: Secured, Lock Ready  
• 4: Secured, Locked |
| platform-type           | string   | Platform type.                                                                |
| platform-type-numeric   | uint32   | Numeric equivalent for the platform-type value.                               |
| platform-brand          | string   | Active platform brand of the Management Controller firmware.                  |
System-parameters-table

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

**Table 118. system-parameters-table properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>platform-brand- numeric</td>
<td>uint32</td>
<td>Numeric equivalent for the platform-brand value.</td>
</tr>
<tr>
<td>redundancy-mode</td>
<td>Embedded</td>
<td>Embedded; see <code>redundancy</code>.</td>
</tr>
<tr>
<td>unhealthy-component</td>
<td>Embedded</td>
<td>Embedded; see <code>unhealthy-component</code>.</td>
</tr>
<tr>
<td>ulp-enabled</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>profiles-enabled</td>
<td>string</td>
<td>Shows whether host profiles are enabled.</td>
</tr>
<tr>
<td>max-ports</td>
<td>uint32</td>
<td>Number of host-interface ports in the controller enclosure.</td>
</tr>
<tr>
<td>max-drives</td>
<td>uint32</td>
<td>Number of disks that the system supports.</td>
</tr>
<tr>
<td>max-volumes</td>
<td>uint32</td>
<td>Number of volumes that the system supports.</td>
</tr>
<tr>
<td>max-vdisks</td>
<td>uint32</td>
<td>Number of linear disk groups that the system supports.</td>
</tr>
<tr>
<td>max-luns</td>
<td>uint32</td>
<td>Number of LUNs that the system supports.</td>
</tr>
<tr>
<td>max-owned-arrays-per-ctrl</td>
<td>uint32</td>
<td>Number of linear disk groups that each controller supports.</td>
</tr>
<tr>
<td>max-storage-pools-per-ctrl</td>
<td>uint32</td>
<td>The number of virtual pools that each controller supports.</td>
</tr>
<tr>
<td>max-components-per-storage-pool</td>
<td>uint32</td>
<td>The number of virtual pools that each pool can contain.</td>
</tr>
<tr>
<td>max-storage-pool-size</td>
<td>string</td>
<td>The maximum size of a virtual pool.</td>
</tr>
<tr>
<td>max-storage-pool-size-numeric</td>
<td>uint64</td>
<td>Unformatted max-storage-pool-size value in blocks.</td>
</tr>
<tr>
<td>max-capi-arrays</td>
<td>uint32</td>
<td>Same as max-vdisks.</td>
</tr>
<tr>
<td>max-chunk-size</td>
<td>uint32</td>
<td>Maximum chunk size for disk groups.</td>
</tr>
<tr>
<td>min-chunk-size</td>
<td>uint32</td>
<td>Minimum chunk size for disk groups.</td>
</tr>
<tr>
<td>physical-position-offset</td>
<td>uint32</td>
<td>Starting index for physical components (enclosures, disks, etc.) in the storage system.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>backoff-percentage</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>vdisk-metadata-size-perdisk-blocks</td>
<td>uint32</td>
<td>Amount of space reserved on a disk for metadata, in blocks.</td>
</tr>
<tr>
<td>vdisk-metadata-size-blocks</td>
<td>uint32</td>
<td>Amount of metadata, in blocks, stored on each disk.</td>
</tr>
<tr>
<td>max-host-groups</td>
<td>uint32</td>
<td>The number of host groups that the system supports.</td>
</tr>
<tr>
<td>max-hosts-per-host-group</td>
<td>uint32</td>
<td>The maximum number of hosts that a host group can contain.</td>
</tr>
<tr>
<td>max-initiator</td>
<td>uint32</td>
<td>The maximum number of initiators that a host can contain.</td>
</tr>
<tr>
<td>max-volume-groups-per-controller</td>
<td>uint32</td>
<td>The maximum number of volume groups that each controller supports.</td>
</tr>
<tr>
<td>max-volumes-per-volume-group</td>
<td>uint32</td>
<td>The maximum number of volumes that a volume group can contain.</td>
</tr>
<tr>
<td>max-replication-sets</td>
<td>uint32</td>
<td>Number of replication sets that the system supports.</td>
</tr>
<tr>
<td>max-enclosures</td>
<td>uint32</td>
<td>Number of enclosures that the system supports.</td>
</tr>
<tr>
<td>local-controller</td>
<td>string</td>
<td>The ID of the controller you are accessing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B: Controller B.</td>
</tr>
<tr>
<td>local-controller-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for local-controller values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: A</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Last six digits of the midplane serial number.</td>
</tr>
<tr>
<td>external-targetid-control</td>
<td>string</td>
<td>Not used.</td>
</tr>
<tr>
<td>external-targetid-control-numeric</td>
<td>uint32</td>
<td>Not used.</td>
</tr>
<tr>
<td>lan-heartbeat</td>
<td>string</td>
<td>Not used.</td>
</tr>
<tr>
<td>lan-heartbeat-numeric</td>
<td>uint32</td>
<td>Not used.</td>
</tr>
<tr>
<td>ip-address-mode</td>
<td>string</td>
<td>CAPI_TWO_IP_ADDRESSES_MODE: Dual controller system has a unique IP address for each controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CAPI_ONE_IP_ADDRESS_MODE: Dual controller system has the same IP address for both controllers, only one active at a time.</td>
</tr>
<tr>
<td>ip-address-mode-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for lan-heartbeat values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: CAPI_TWO_IP_ADDRESSES_MODE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: CAPI_ONE_IP_ADDRESS_MODE</td>
</tr>
<tr>
<td>debug-flags</td>
<td>uint32</td>
<td>For use by service personnel.</td>
</tr>
<tr>
<td>enclosure-flags</td>
<td>uint32</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>num-global-spares</td>
<td>uint32</td>
<td>Number of global-spare disks defined in the storage system.</td>
</tr>
<tr>
<td>dynamic-spare-rescan-rate</td>
<td>uint32</td>
<td>Interval at which the system is scanned for disks automatically designated as spares, if the dynamic spares feature is enabled.</td>
</tr>
<tr>
<td>performance-tuning-flags</td>
<td>string</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>performance-tuning-flags-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for performance-tuning values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Enabled</td>
</tr>
<tr>
<td>min-backing-store-size</td>
<td>uint32</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>max-task-retention-count</td>
<td>uint32</td>
<td>Maximum retention count for a task that creates snapshots or replication volumes.</td>
</tr>
<tr>
<td>max-fc-speed</td>
<td>string</td>
<td>Maximum FC host-port speed.</td>
</tr>
<tr>
<td>max-fc-speed-numeric</td>
<td>uint32</td>
<td>Numeric equivalent for the max-fc-speed value.</td>
</tr>
<tr>
<td>max-iscsi-speed</td>
<td>string</td>
<td>Maximum iSCSI host-port speed.</td>
</tr>
<tr>
<td>max-iscsi-speed-numeric</td>
<td>uint32</td>
<td>Numeric equivalent for the max-iscsi-speed value.</td>
</tr>
<tr>
<td>max-peers-allowed</td>
<td>uint32</td>
<td>The maximum number of peer connections that the system supports.</td>
</tr>
<tr>
<td>peers-in-use-count</td>
<td>uint32</td>
<td>The number of peer connections present in the system.</td>
</tr>
<tr>
<td>max-ar-vols-allowed</td>
<td>uint32</td>
<td>The maximum number of virtual replication volumes that the system supports.</td>
</tr>
<tr>
<td>ar-sets-in-use-count</td>
<td>uint32</td>
<td>The number of virtual replication volumes present in the system.</td>
</tr>
<tr>
<td>linear-replication-configured</td>
<td>string</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>linear-replication-configured-numeric</td>
<td>uint32</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>virtual-replication-configured</td>
<td>string</td>
<td>• False: No virtual replication sets exist on the system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• True: At least one virtual replication set exists on the system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: False</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: True</td>
</tr>
<tr>
<td>max-adapt-drives-per-disk-group</td>
<td>uint32</td>
<td>The maximum number of disks that an ADAPT disk group can contain.</td>
</tr>
<tr>
<td>min-adapt-drives-per-disk-group</td>
<td>uint32</td>
<td>The minimum number of disks that an ADAPT disk group can contain.</td>
</tr>
<tr>
<td>max-adapt-disk-groups-per-system</td>
<td>uint32</td>
<td>The maximum number of ADAPT disk groups that the system supports.</td>
</tr>
<tr>
<td>max-adapt-drives-per-expansion</td>
<td>uint32</td>
<td>The maximum number of disks by which an ADAPT disk group can be expanded.</td>
</tr>
</tbody>
</table>
This basetype is used by `show tasks`.

### Table 119. tasks properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>Task name.</td>
</tr>
<tr>
<td>type</td>
<td>string</td>
<td>Type of operation this task performs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>TakeSnapshot</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>ResetSnapshot</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Replicate</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>EnableDSD</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>DisableDSD</code></td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Task status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Uninitialized</code>: Task is not yet ready to run.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Ready</code>: Task is ready to run.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Active</code>: Task is running.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Error</code>: Task has an error.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Complete</code>: For a TakeSnapshot task only, the task is complete but not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>yet ready to run again.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Deleted</code>: The task is expired but this state is not yet synchronized to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the partner controller.</td>
</tr>
<tr>
<td>state</td>
<td>string</td>
<td>Current step of the task.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For an EnableDSD or DisableDSD task:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Start</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For a TakeSnapshot task:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Start</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>VerifyVolume</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>ValidateLicensingLimit</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>CreateName</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>CreateSnap</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>VerifySnap</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>InspectRetention</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>FindOldestSnap</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>UnmapSnap</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>ResetSnap</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>RenameSnap</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For a ResetSnapshot task:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Start</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>VerifySnap</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>UnmapSnap</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>ResetSnap</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For a Replicate task:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Idle</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>Replicate</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>VerifyRunning</code></td>
</tr>
<tr>
<td>error-message</td>
<td>string</td>
<td>• If an error occurred while processing the task, the error message.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blank if no error has occurred.</td>
</tr>
</tbody>
</table>
### tier-hist-statistics

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

**Table 120. tier-hist-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>associated-vdisk-serial</td>
<td>string</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>task-details</td>
<td>Embedded;</td>
<td>see cs-replicate-tasks, reset-snapshot-tasks, snap-tasks, snapshot-with-retention-task.</td>
</tr>
<tr>
<td>number-of-iods</td>
<td>uint64</td>
<td>Total number of read and write operations since the last sampling time.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>Number of read operations since the last sampling time.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>Number of write operations since the last sampling time.</td>
</tr>
<tr>
<td>total-data-transferred</td>
<td>string</td>
<td>Total amount of data read and written since the last sampling time.</td>
</tr>
<tr>
<td>total-data-transferred-numeric</td>
<td>uint64</td>
<td>Unformatted total-data-transferred value.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>Amount of data read since the last sampling time.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>Unformatted data-read value.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>Amount of data written since the last sampling time.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>Unformatted data-written value.</td>
</tr>
<tr>
<td>total-iops</td>
<td>uint64</td>
<td>Total number of read and write operations per second since the last sampling time.</td>
</tr>
<tr>
<td>read-iops</td>
<td>uint64</td>
<td>Number of read operations per second since the last sampling time.</td>
</tr>
<tr>
<td>write-iops</td>
<td>uint64</td>
<td>Number of write operations per second since the last sampling time.</td>
</tr>
<tr>
<td>total-bytes-per-sec</td>
<td>string</td>
<td>Total data transfer rate, in bytes per second, since the last sampling time.</td>
</tr>
<tr>
<td>total-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted total-bytes-per-second value.</td>
</tr>
<tr>
<td>read-bytes-per-sec</td>
<td>string</td>
<td>Data transfer rate, in bytes per second, for read operations since the last sampling time.</td>
</tr>
<tr>
<td>read-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted read-bytes-per-second value.</td>
</tr>
<tr>
<td>write-bytes-per-sec</td>
<td>string</td>
<td>Data transfer rate, in bytes per second, for write operations last sampling time.</td>
</tr>
<tr>
<td>write-bytes-per-sec-numeric</td>
<td>uint64</td>
<td>Unformatted write-bytes-per-second value.</td>
</tr>
<tr>
<td>number-of-allocated-pages</td>
<td>uint64</td>
<td>The number of 4 MB pages allocated to volumes in the pool.</td>
</tr>
<tr>
<td>number-of-page-moves-in</td>
<td>uint64</td>
<td>The number of pages moved into this tier from a different tier.</td>
</tr>
<tr>
<td>number-of-page-moves-out</td>
<td>uint64</td>
<td>The number of pages moved out of this tier to other tiers.</td>
</tr>
<tr>
<td>number-of-page-rebalances</td>
<td>uint64</td>
<td>The number of pages moved between disks in this tier to automatically load balance.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>----------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>number-of-initial-allocations</td>
<td>uint64</td>
<td>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.)</td>
</tr>
<tr>
<td>number-of-unmaps</td>
<td>uint64</td>
<td>The number of 4 MB pages that are automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).</td>
</tr>
<tr>
<td>number-of-rfc-copies</td>
<td>uint64</td>
<td>The number of 4 MB pages copied from spinning disks to SSD read cache (read flash cache).</td>
</tr>
<tr>
<td>number-of-zero-pages-reclaimed</td>
<td>uint64</td>
<td>The number of empty (zero-filled) pages that were reclaimed during this sample period.</td>
</tr>
<tr>
<td>sample-time</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds, when the data sample was taken.</td>
</tr>
<tr>
<td>sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted sample-time value.</td>
</tr>
</tbody>
</table>

**tier-statistics**

This basetype is used by `show tier-statistics` and `show pool-statistics`.

**Table 121. tier-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the tier or pool.</td>
</tr>
<tr>
<td>pool</td>
<td>string</td>
<td>The name of the pool.</td>
</tr>
<tr>
<td>tier</td>
<td>string</td>
<td>• Archive: The lowest storage tier, which uses midline spinning SAS disks (&lt;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).</td>
</tr>
<tr>
<td>tier-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for tier values.</td>
</tr>
<tr>
<td>pages-alloc-per-minute</td>
<td>uint32</td>
<td>The rate, in pages per minute, at which pages are allocated to volumes in the pool because they need more space to store data.</td>
</tr>
<tr>
<td>pages-dealloc-per-minute</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>pages-reclaimed</td>
<td>uint32</td>
<td>The number of 4 MB pages that have been automatically reclaimed and deallocated because they are empty (they contain only zeroes for data).</td>
</tr>
<tr>
<td>num-pages-unmap-per-minute</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>resettable-statistics</td>
<td>Embedded; see resettable-statistics.</td>
<td></td>
</tr>
</tbody>
</table>

## tier-summary

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

### Table 122. tier-summary properties

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

## tiers

This basetype is used by `show pools` and `show tiers`.

### Table 123. tiers properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the tier.</td>
</tr>
<tr>
<td>pool</td>
<td>string</td>
<td>The name of the pool.</td>
</tr>
</tbody>
</table>
| tier         | string| - **Archive**: The lowest storage tier, which uses midline spinning SAS disks (<10k RPM, high capacity).  
               - **Performance**: The highest storage tier, which uses SSDs (high speed).  
               - **Read Cache**: The tier that provides read cache for a storage pool.  
               - **Standard**: The tier that uses enterprise-class spinning SAS disks (10k/15k RPM, higher capacity).  
| tier-numeric | uint32 | Numeric equivalents for `tier` values.                                    |
|              |       | - 0: N/A  
              |              | - 1: **Performance**  
              |              | - 2: **Standard**  
|

432  API basetype properties
## pool-percentage
- **Name:** pool-percentage
- **Type:** uint8
- **Description:** The percentage of pool capacity that the tier occupies.

## diskcount
- **Name:** diskcount
- **Type:** uint8
- **Description:** The number of disks in the tier.

## raw-size
- **Name:** raw-size
- **Type:** string
- **Description:** 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
- **Name:** raw-size-numeric
- **Type:** uint64
- **Description:** Unformatted raw-size value in blocks.

## total-size
- **Name:** total-size
- **Type:** string
- **Description:** The total capacity of the tier.

## total-size-numeric
- **Name:** total-size-numeric
- **Type:** uint64
- **Description:** Unformatted total-size value in blocks.

## allocated-size
- **Name:** allocated-size
- **Type:** string
- **Description:** The amount of space currently allocated to volumes in the tier.

## allocated-size-numeric
- **Name:** allocated-size-numeric
- **Type:** uint64
- **Description:** Unformatted allocated-size value in blocks.

## available-size
- **Name:** available-size
- **Type:** string
- **Description:** The available capacity in the tier.

## available-size-numeric
- **Name:** available-size-numeric
- **Type:** uint64
- **Description:** Unformatted available-size value in blocks.

## affinity-size
- **Name:** affinity-size
- **Type:** string
- **Description:** The total size of volumes configured to have affinity for that tier.

## affinity-size-numeric
- **Name:** affinity-size-numeric
- **Type:** uint64
- **Description:** Unformatted affinity-size value in blocks.

### time-settings-table
This basetype is used by `show controller-date`.

**Table 124. time-settings-table properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>date-time</td>
<td>string</td>
<td>Date and time, in the format <code>year-month-day hour:minutes:seconds (UTC)</code>, reported by the controller being accessed.</td>
</tr>
<tr>
<td>date-time-numeric</td>
<td>uint32</td>
<td>Unformatted date-time value.</td>
</tr>
<tr>
<td>time-zone-offset</td>
<td>string</td>
<td>The system's time zone as an offset in hours and minutes from UTC. This is shown only if NTP is enabled.</td>
</tr>
<tr>
<td>ntp-state</td>
<td>string</td>
<td>Shows whether Network Time Protocol (NTP) is in use.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <code>activated</code>: NTP is enabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- <code>deactivated</code>: NTP is disabled.</td>
</tr>
<tr>
<td>ntp-address</td>
<td>string</td>
<td>NTP server IP address, or 0.0.0.0 if not set.</td>
</tr>
</tbody>
</table>
unhealthy-component

This basetype is used by all commands that show component health.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>component-type</td>
<td>string</td>
<td>Component type.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• super-cap: Supercapacitor pack</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MC: Management Controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• port: Host port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• controller: Controller module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• expansion module: Expansion module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PSU: Power supply unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• disk: Disk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• enclosure: Enclosure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• vdisk: Disk group (v2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• disk group: Disk group (v3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• fan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CompactFlash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• disk slot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SAS port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• network port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• virtual pool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• virtual disk group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• volume</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• volume: Source volume</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• snapshot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• host</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• volume map</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• system</td>
</tr>
<tr>
<td>component-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for component-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: super-cap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: MC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: expansion module</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: PSU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6: disk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7: enclosure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8: vdisk (v2) or disk group (v3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 9: fan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 10: CompactFlash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 11: disk slot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 12: SAS port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 13: sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 14: network port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 15: virtual pool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 16: virtual disk group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 17: volume</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 19: volume (source volume)</td>
</tr>
</tbody>
</table>
### unwritable-cache

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

**Table 126. unwritable-cache properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>unwritable-a- percentage</td>
<td>uint8</td>
<td>The percentage of cache space occupied by unwritable data in controller A.</td>
</tr>
<tr>
<td>unwritable-b- percentage</td>
<td>uint8</td>
<td>The percentage of cache space occupied by unwritable data in controller B.</td>
</tr>
</tbody>
</table>

### users

This basetype is used by `show users`.

**Table 127. users properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>username</td>
<td>string</td>
<td>User name.</td>
</tr>
</tbody>
</table>

**roles**

- **monitor**: User can view but not change system settings.
- **manage**: User can view and change system settings.
- **diagnostic**: User can view and change system settings.
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user-type</td>
<td>string</td>
<td>The experience level of the user: Novice, Standard, Advanced, or Diagnostic. This parameter does not affect access to commands.</td>
</tr>
<tr>
<td>user-type-numeric</td>
<td>string</td>
<td>Numeric equivalents for user-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Novice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Advanced</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: Diagnostic</td>
</tr>
<tr>
<td>user-locale</td>
<td>string</td>
<td>The display language.</td>
</tr>
<tr>
<td>user-locale-numeric</td>
<td>string</td>
<td>Numeric equivalents for user-locale values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: English</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Spanish</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: French</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: German</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7: Japanese</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8: Korean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 11: Chinese-simplified</td>
</tr>
<tr>
<td>interface-access- WBI</td>
<td>string</td>
<td>• x: User can access the ME Storage Manager web-browser interface.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(blank): User cannot access this interface.</td>
</tr>
<tr>
<td>interface-access- CLI</td>
<td>string</td>
<td>• x: User can access the command-line interface.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(blank): User cannot access this interface.</td>
</tr>
<tr>
<td>interface-access- FTP</td>
<td>string</td>
<td>• x: User can access the FTP interface.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(blank): User cannot access this interface.</td>
</tr>
<tr>
<td>interface-access- SMIS</td>
<td>string</td>
<td>• x: User can access the Storage Management Initiative Specification (SMI-S) interface.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(blank): User cannot access this interface.</td>
</tr>
<tr>
<td>interface-access- SNMP</td>
<td>string</td>
<td>• U: The user can access the SNMPv3 interface and view the MIB.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T: The user can access the SNMPv3 interface and receive trap notifications.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(blank): User cannot access this interface.</td>
</tr>
<tr>
<td>storage-size-base</td>
<td>uint8</td>
<td>The base for entry and display of storage-space sizes:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 10: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>storage-size-precision</td>
<td>uint8</td>
<td>The number of decimal places (1-10) for display of storage-space sizes.</td>
</tr>
<tr>
<td>storage-size-units</td>
<td>string</td>
<td>The unit for display of storage-space sizes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• auto: Lets the system determine the proper unit for a size.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MB: Megabytes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• GB: Gigabytes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• TB: Terabytes.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>temperature-scale</td>
<td>string</td>
<td>- Celsius: Use the Celsius scale to display temperature values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Fahrenheit: Use the Fahrenheit scale to display temperature values.</td>
</tr>
<tr>
<td>timeout</td>
<td>uint32</td>
<td>Time in seconds that the session can be idle before it automatically ends.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valid values are 120-43200 seconds (2-720 minutes).</td>
</tr>
<tr>
<td>authentication-type</td>
<td>string</td>
<td>For an SNMPv3 user, this specifies whether to use a security authentication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>protocol. Authentication uses the user password.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- none: No authentication.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- MD5: MD5 authentication.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- SHA : SHA-1 authentication.</td>
</tr>
<tr>
<td>privacy-type</td>
<td>string</td>
<td>For an SNMPv3 user, this specifies whether to use a security encryption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>protocol. This parameter requires the privacy-password property and the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>authentication-type property.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- none: No encryption.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- DES : Data Encryption Standard.</td>
</tr>
<tr>
<td>password</td>
<td>string</td>
<td>User password. For a standard user the password is represented by eight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>asterisks. For an SNMPv3 user this is the authentication password.</td>
</tr>
<tr>
<td>default-password-</td>
<td>string</td>
<td>Shows whether the default password for the user has been changed.</td>
</tr>
<tr>
<td>changed</td>
<td></td>
<td>- False</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- True</td>
</tr>
<tr>
<td>default-password-</td>
<td>uint32</td>
<td>Numeric equivalents for default-password-changed values.</td>
</tr>
<tr>
<td>changed-numeric</td>
<td></td>
<td>- 0: False</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: True</td>
</tr>
<tr>
<td>privacy-password</td>
<td>string</td>
<td>Encryption password for an SNMPv3 user whose privacy type is set to DES or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AES.</td>
</tr>
<tr>
<td>trap-destination</td>
<td>string</td>
<td>For an SNMPv3 user whose interface-access-SNMP property is set to snmpTarget,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>this specifies the IP address of the host that will receive SNMP traps.</td>
</tr>
</tbody>
</table>

**vdisk-hist-statistics**

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

**Table 128. vdisk-hist-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>total-data- transferred</td>
<td>string</td>
<td>Total amount of data read and written since the last sampling time.</td>
</tr>
<tr>
<td>total-data- transferred-numeric</td>
<td>uint64</td>
<td>Unformatted total-data-transferred value.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>Amount of data read since the last sampling time.</td>
</tr>
</tbody>
</table>
### vdisk-statistics

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

**Table 129. vdisk-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the disk group.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the disk group.</td>
</tr>
<tr>
<td>bytes-per-second</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>bytes-per-second-numeric</td>
<td>uint64</td>
<td>Unformatted bytes-per-second value.</td>
</tr>
<tr>
<td>iops</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>Number of read operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>Number of write operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>Amount of data read since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>Unformatted data-read value.</td>
</tr>
</tbody>
</table>
### Table 130.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>data-written</td>
<td>string</td>
<td>Amount of data written since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>Unformatted data-written value.</td>
</tr>
<tr>
<td>avg-rsp-time</td>
<td>uint32</td>
<td>Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.</td>
</tr>
<tr>
<td>avg-read-rsp-time</td>
<td>uint32</td>
<td>Average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.</td>
</tr>
<tr>
<td>avg-write-rsp-time</td>
<td>uint32</td>
<td>Average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.</td>
</tr>
<tr>
<td>reset-time</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>reset-time-numeric</td>
<td>uint32</td>
<td>Unformatted reset-time value.</td>
</tr>
<tr>
<td>start-sample-time</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>start-sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted start-sample-time value.</td>
</tr>
<tr>
<td>stop-sample-time</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>stop-sample-time-numeric</td>
<td>uint32</td>
<td>Unformatted stop-sample-time value.</td>
</tr>
</tbody>
</table>

### versions

This basetype is used by `show configuration` and `show versions`.

**Table 130.**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sc-cpu-type</td>
<td>string</td>
<td>Storage Controller processor type.</td>
</tr>
<tr>
<td>bundle-version</td>
<td>string</td>
<td>Firmware bundle version.</td>
</tr>
<tr>
<td>build-date</td>
<td>string</td>
<td>Firmware bundle build date.</td>
</tr>
<tr>
<td>sc-fw</td>
<td>string</td>
<td>Storage Controller firmware version.</td>
</tr>
<tr>
<td>sc-baselevel</td>
<td>string</td>
<td>Storage Controller firmware base level.</td>
</tr>
<tr>
<td>sc-memory</td>
<td>string</td>
<td>Storage Controller memory-controller FPGA firmware version.</td>
</tr>
<tr>
<td>sc-fu-version</td>
<td>string</td>
<td>Storage Controller FU processor version.</td>
</tr>
<tr>
<td>sc-loader</td>
<td>string</td>
<td>Storage Controller loader firmware version.</td>
</tr>
<tr>
<td>capi-version</td>
<td>string</td>
<td>Configuration API (CAPI) version.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>mc-fw</td>
<td>string</td>
<td>Management Controller firmware version.</td>
</tr>
<tr>
<td>mc-loader</td>
<td>string</td>
<td>Management Controller loader firmware version.</td>
</tr>
<tr>
<td>mc-base-fw</td>
<td>string</td>
<td>Management Controller firmware base level.</td>
</tr>
<tr>
<td>fw-default-platform-brand</td>
<td>string</td>
<td>Default platform brand of the Management Controller firmware.</td>
</tr>
<tr>
<td>fw-default-platform-brand-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for fw-default-platform-brand values.</td>
</tr>
<tr>
<td>ec-fw</td>
<td>string</td>
<td>Expander Controller firmware version.</td>
</tr>
<tr>
<td>pld-rev</td>
<td>string</td>
<td>Complex Programmable Logic Device (CPLD) firmware version.</td>
</tr>
<tr>
<td>prm-version</td>
<td>string</td>
<td>CPLD Power Reset Manager (PRM) version.</td>
</tr>
<tr>
<td>hw-rev</td>
<td>string</td>
<td>Controller hardware version.</td>
</tr>
<tr>
<td>him-rev</td>
<td>string</td>
<td>Host interface module revision.</td>
</tr>
<tr>
<td>him-model</td>
<td>string</td>
<td>Host interface module model.</td>
</tr>
<tr>
<td>backplane-type</td>
<td>uint8</td>
<td>Backplane type.</td>
</tr>
<tr>
<td>host-channel_revision</td>
<td>uint8</td>
<td>Host interface hardware (chip) version.</td>
</tr>
<tr>
<td>disk-channel_revision</td>
<td>uint8</td>
<td>Disk interface hardware (chip) version.</td>
</tr>
<tr>
<td>mrc-version</td>
<td>string</td>
<td>Memory Reference Code (MRC) version for Storage Controller boot Flash.</td>
</tr>
<tr>
<td>ctk-version</td>
<td>string</td>
<td>• version: Customization Toolkit (CTK) version applied to the system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No CTK present: No CTK version has been applied to this system.</td>
</tr>
</tbody>
</table>

**virtual-disk-summary**

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

**Table 131. virtual-disk-summary properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the disk group.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the disk group.</td>
</tr>
<tr>
<td>vdisk-hist-statistics</td>
<td>Embedded</td>
<td>see vdisk-hist-statistics.</td>
</tr>
</tbody>
</table>

**virtual-disks**

This basetype is used by `show configuration` and `show vdisks`.

**Table 132. virtual-disks properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the disk group.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>blocksize</td>
<td>uint32</td>
<td>The size of a block, in bytes.</td>
</tr>
<tr>
<td>size</td>
<td>string</td>
<td>The size of the disk group, formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>size-numeric</td>
<td>uint64</td>
<td>Unformatted size value in blocks.</td>
</tr>
<tr>
<td>freespace</td>
<td>string</td>
<td>Amount of free (available) space in the disk group, formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>freespace-numeric</td>
<td>uint64</td>
<td>Unformatted freespace value in blocks.</td>
</tr>
<tr>
<td>owner</td>
<td>string</td>
<td>Either the preferred owner during normal operation or the partner controller when the preferred owner is offline.</td>
</tr>
<tr>
<td>owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for owner values.</td>
</tr>
<tr>
<td>preferred-owner</td>
<td>string</td>
<td>Controller that owns the disk group and its volumes during normal operation.</td>
</tr>
<tr>
<td>preferred-owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for preferred-owner values.</td>
</tr>
<tr>
<td>raidtype</td>
<td>string</td>
<td>The disk-group RAID level.</td>
</tr>
<tr>
<td>raidtype-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for raidtype values.</td>
</tr>
<tr>
<td>storage-type</td>
<td>string</td>
<td>• Linear: The disk group acts as a linear pool.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Virtual: The disk group is in a virtual pool.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>storage-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for storage-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Linear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Virtual</td>
</tr>
<tr>
<td>diskcount</td>
<td>uint16</td>
<td>Number of disks in the disk group.</td>
</tr>
<tr>
<td>sparecount</td>
<td>uint16</td>
<td>Number of spare disks assigned to the disk group.</td>
</tr>
<tr>
<td>chunksize</td>
<td>string</td>
<td>• For RAID levels except NRAID, RAID 1, and RAID 50, the configured chunk size for the disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For NRAID and RAID 1, chunk size has no meaning and is therefore shown as not applicable (N/A).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For RAID 50, the disk-group chunk size calculated as configured-chunk- size x (subgroup-members- 1). For a disk group configured to use 64-KB chunk size and 4-disk subgroups, the value would be 192k (64KB x 3).</td>
</tr>
<tr>
<td>status</td>
<td>string</td>
<td>Disk-group status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CRIT: Critical. The disk group is online but isn't fault tolerant because some of its disks are down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• DMGD: Damaged. The disk group is online and fault tolerant, but some of its disks are damaged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• FTDN: Fault tolerant with a down disk. The disk group is online and fault tolerant, but some of its disks are down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• FTOL: Fault tolerant and online.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MSNG: Missing. The disk group is online and fault tolerant, but some of its disks are missing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OFFL: Offline. Either the disk group is using offline initialization, or its disks are down and data may be lost.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• STOP: The disk group is stopped.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• UP: Up. The disk group is online and does not have fault-tolerant attributes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• UNKN: Unknown.</td>
</tr>
<tr>
<td>status-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for status values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: FTOL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: FTDN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: CRIT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: OFFL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: QTCR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5: QTOF</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>lun</td>
<td>uint32</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>min-drive-size</td>
<td>string</td>
<td>Minimum disk size that can this disk group can use, formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>min-drive-size- numeric</td>
<td>uint64</td>
<td>Unformatted min-drive-size value in blocks.</td>
</tr>
<tr>
<td>create-date</td>
<td>string</td>
<td>Date and time, in the format year-month-day hour:minutes:seconds (UTC), when the disk group was created.</td>
</tr>
<tr>
<td>create-date- numeric</td>
<td>uint32</td>
<td>Unformatted create-date value.</td>
</tr>
<tr>
<td>cache-read-ahead</td>
<td>string</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>cache-read-ahead- numeric</td>
<td>uint64</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>cache-flush-period</td>
<td>uint32</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>read-ahead-enabled</td>
<td>string</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>read-ahead-enabled-numeric</td>
<td>uint32</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>write-back-enabled</td>
<td>string</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>write-back-enabled-numeric</td>
<td>uint32</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>job-running</td>
<td>string</td>
<td>Same as current-job.</td>
</tr>
<tr>
<td>current-job</td>
<td>string</td>
<td>Job running on the disk group, if any.</td>
</tr>
<tr>
<td>array-drive-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for array-drive-type values.</td>
</tr>
</tbody>
</table>

- 6: QTDN
- 7: STOP
- 8: MSNG
- 9: DMGD
- 250: UP
- other: UNKN

- 1: MIXED
- 4: SAS
- 8: sSAS
- 11: SAS MDL
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>is-job-auto-abortable</td>
<td>string</td>
<td>- false: The current job must be manually aborted before you can delete the disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- true: The current job will automatically abort if you delete the disk group.</td>
</tr>
<tr>
<td>is-job-auto-abortable-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>is-job-auto-abortable</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: false</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: true</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the disk group.</td>
</tr>
<tr>
<td>blocks</td>
<td>string</td>
<td>The number of blocks, whose size is specified by the blocksize property.</td>
</tr>
<tr>
<td>blocks-numeric</td>
<td>uint64</td>
<td>Unformatted blocks value.</td>
</tr>
<tr>
<td>disk-dsd-enable-vdisk</td>
<td>string</td>
<td>- Disabled: DSD is disabled for the disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Enabled - all spinning: DSD is enabled for the disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Partial spin-down: DSD is enabled for the disk group and its disks are partially spun down to conserve power.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Full spin-down: DSD is enabled for the disk group and its disks are fully spun down to conserve power.</td>
</tr>
<tr>
<td>disk-dsd-enable-vdisk-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>disk-dsd-enable-vdisk</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Enabled - all spinning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: Partial spin-down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: Full spin-down</td>
</tr>
<tr>
<td>disk-dsd-delay-vdisk</td>
<td>uint32</td>
<td>For spinning disks, the period of inactivity after which the disk group’s disks and dedicated spares will automatically spin down, from 1 to 360 minutes. The value 0 means spin down is disabled.</td>
</tr>
<tr>
<td>pool-sector-format</td>
<td>string</td>
<td>The sector format of disks in the disk group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 512n: All disks use 512-byte native sector size. Each logical block and physical block is 512 bytes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 512e: All disks use 512-byte emulated sector size. Each logical block is 512 bytes and each physical block is 4096 bytes. Each logical block will be stored sequentially in each physical block. Logical blocks may or may not be aligned with physical block boundaries.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 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).</td>
</tr>
<tr>
<td>pool-sector-format-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>pool-sector-format-numeric</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: 512n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: 512e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 3: Mixed</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>- OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- N/A</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>health</code> values.</td>
</tr>
</tbody>
</table>
### Name | Type | Description
--- | --- | ---
• 0: OK  
• 1: Degraded  
• 2: Fault  
• 3: Unknown  
• 4: N/A

| health-reason | string | If Health is not OK, the reason for the health state. |
| health-recommendation | string | If Health is not OK, the recommended actions to take to resolve the health issue. |
| unhealthy-component | Embedded; see unhealthy-component |

### volume-groups
This basetype is used by `show volume-groups`.

#### Table 133. volume-groups

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Volume group ID.</td>
</tr>
<tr>
<td>group-name</td>
<td>string</td>
<td>The name of the volume group in the format <code>volume-group.*</code>, where <code>*</code> represents all volumes in the group.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the volume group.</td>
</tr>
<tr>
<td>type</td>
<td>string</td>
<td>The group type, which is <code>Volume</code>.</td>
</tr>
<tr>
<td>type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for <code>type</code> values.</td>
</tr>
<tr>
<td>member-count</td>
<td>uint32</td>
<td>The number of volumes in the volume group.</td>
</tr>
<tr>
<td>replication-set-serial</td>
<td>string</td>
<td>The serial number of the replication set.</td>
</tr>
<tr>
<td>volumes</td>
<td>Embedded; see volumes</td>
<td></td>
</tr>
</tbody>
</table>

### volume-group-view
This basetype is used by `show maps` if volume groups exist.

#### Table 134. volume-group-view properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Volume group ID.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the volume group.</td>
</tr>
<tr>
<td>group-name</td>
<td>string</td>
<td>The name of the volume group in the format <code>volume-group.*</code>, where <code>*</code> represents all volumes in the group.</td>
</tr>
<tr>
<td>volume-view-mappings</td>
<td>Embedded; see volume-view-mappings</td>
<td></td>
</tr>
</tbody>
</table>
volume-group-view-mappings

This basetype is used by show maps.

Table 135. volume-group-view-mappings properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Mapping ID.</td>
</tr>
<tr>
<td>parent-id</td>
<td>string</td>
<td>For a mapping between a volume and an initiator, the volume ID - or if the volume is a member of a volume group, the volume-group ID.</td>
</tr>
<tr>
<td>mapped-id</td>
<td>string</td>
<td>The ID of the mapping target, such as an initiator.</td>
</tr>
<tr>
<td>ports</td>
<td>string</td>
<td>• The controller host ports to which the mapping applies.</td>
</tr>
<tr>
<td>access</td>
<td>string</td>
<td>• read-write: Read and write.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• read-only: Read only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no-access: No access (masked).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• not-mapped: Not mapped.</td>
</tr>
<tr>
<td>access-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of access values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: not-mapped</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: no-access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: read-only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: read-write</td>
</tr>
<tr>
<td>initiator-id</td>
<td>string</td>
<td>• For an FC initiator, its WWPN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For a SAS initiator, its WWPN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For an iSCSI initiator, its node name (typically the IQN).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• all other initiators: The volume's default mapping.</td>
</tr>
<tr>
<td>nickname</td>
<td>string</td>
<td>• For a host, its name in the format host-name.* where the * represents all initiators in the host.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For a host group, its name in the format host-group.<em>.</em> where the first * represents all hosts in the host group and the second * represents all initiators in those hosts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blank if not set or for all other initiators.</td>
</tr>
<tr>
<td>host-profile</td>
<td>string</td>
<td>Standard: Default profile.</td>
</tr>
<tr>
<td>host-profile-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of host-profile values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Standard</td>
</tr>
<tr>
<td>lun-view</td>
<td>Embedded</td>
<td>Embedded; see volume-view-mappings.</td>
</tr>
</tbody>
</table>

volume-names

This basetype is used by show volume-names.

Table 136. volume-names properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>volume-name</td>
<td>string</td>
<td>Volume name.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Volume serial number.</td>
</tr>
</tbody>
</table>

**volume-reservations**

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

**Table 137. volume-reservations**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>volume-name</td>
<td>string</td>
<td>The name of the volume.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the volume.</td>
</tr>
<tr>
<td>reservation-active</td>
<td>string</td>
<td>• Free: The volume is not reserved.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reserved: The volume has been reserved by a host.</td>
</tr>
<tr>
<td>reservation-active-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for reservation-active values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Free</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Reserved</td>
</tr>
<tr>
<td>pgr-generation</td>
<td>uint32</td>
<td>The generation of the volume reservation, shown as a hexadecimal value.</td>
</tr>
<tr>
<td>host-id</td>
<td>string</td>
<td>• For an FC initiator, its WWPN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For a SAS initiator, its WWPN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For an iSCSI initiator, its node name (typically the IQN).</td>
</tr>
<tr>
<td>port</td>
<td>string</td>
<td>The controller host-port identifiers.</td>
</tr>
<tr>
<td>reserve-key</td>
<td>string</td>
<td>The reservation key, shown as a hexadecimal value.</td>
</tr>
<tr>
<td>reserve-scope</td>
<td>string</td>
<td>The reservation scope, Logical Unit.</td>
</tr>
<tr>
<td>reserve-scope-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for reserve-scope values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Logical Unit</td>
</tr>
<tr>
<td>reserve-type</td>
<td>string</td>
<td>The reservation type.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Undefined: The volume has no persistent reservations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Write Exclusive: Write commands are only allowed for a single reservation holder.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Exclusive Access: Certain access (read, write) commands are only allowed for a single reservation holder.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Write Exclusive - Registrants Only: Write commands are only allowed for registered hosts. There is a single reservation holder.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Exclusive Access - Registrants Only: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Write Exclusive - All Registrants: Write commands are only allowed for registered hosts. There is a single reservation holder.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Exclusive Access - All Registrants: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder.</td>
</tr>
<tr>
<td>reserve-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for reserve-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Undefined</td>
</tr>
</tbody>
</table>
### Name

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Volume ID in the format V #, where # starts at 1 and increments for each new volume to uniquely identify it. The value is generated from available data in the current CLI session and may change after a Management Controller restart.</td>
</tr>
<tr>
<td>url</td>
<td>string</td>
<td>Volume URL.</td>
</tr>
<tr>
<td>virtual-disk-name</td>
<td>string</td>
<td>The name of the disk group or pool that contains the volume.</td>
</tr>
<tr>
<td>storage-pool-name</td>
<td>string</td>
<td>The name of the disk group or pool that contains the volume.</td>
</tr>
<tr>
<td>storage-pools-url</td>
<td>string</td>
<td>Pool URL.</td>
</tr>
<tr>
<td>volume-name</td>
<td>string</td>
<td>Volume name.</td>
</tr>
<tr>
<td>size</td>
<td>string</td>
<td>Volume capacity, formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>size-numeric</td>
<td>uint64</td>
<td>Unformatted size value in blocks.</td>
</tr>
<tr>
<td>total-size</td>
<td>string</td>
<td>The total size of the volume.</td>
</tr>
<tr>
<td>total-size-numeric</td>
<td>uint64</td>
<td>Unformatted total-size value in blocks.</td>
</tr>
<tr>
<td>allocated-size</td>
<td>string</td>
<td>The amount of space currently allocated to a virtual volume, or the total size of a linear volume.</td>
</tr>
<tr>
<td>allocated-size-numeric</td>
<td>uint64</td>
<td>Unformatted allocated-size value in blocks.</td>
</tr>
<tr>
<td>storage-type</td>
<td>string</td>
<td>- Linear: The volume is in a linear pool.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Virtual: The volume is in a virtual pool.</td>
</tr>
<tr>
<td>storage-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for storage-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Linear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Virtual</td>
</tr>
<tr>
<td>preferred-owner</td>
<td>string</td>
<td>Controller that owns the volume during normal operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- B: Controller B.</td>
</tr>
<tr>
<td>preferred-owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for preferred-owner values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: A</td>
</tr>
</tbody>
</table>

**volumes**

This basetype is used by `show volumes` and `show volume-groups`.

#### Table 138. volumes properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Volume ID in the format V #, where # starts at 1 and increments for each new volume to uniquely identify it. The value is generated from available data in the current CLI session and may change after a Management Controller restart.</td>
</tr>
<tr>
<td>url</td>
<td>string</td>
<td>Volume URL.</td>
</tr>
<tr>
<td>virtual-disk-name</td>
<td>string</td>
<td>The name of the disk group or pool that contains the volume.</td>
</tr>
<tr>
<td>storage-pool-name</td>
<td>string</td>
<td>The name of the disk group or pool that contains the volume.</td>
</tr>
<tr>
<td>storage-pools-url</td>
<td>string</td>
<td>Pool URL.</td>
</tr>
<tr>
<td>volume-name</td>
<td>string</td>
<td>Volume name.</td>
</tr>
<tr>
<td>size</td>
<td>string</td>
<td>Volume capacity, formatted to use the current base, precision, and units.</td>
</tr>
<tr>
<td>size-numeric</td>
<td>uint64</td>
<td>Unformatted size value in blocks.</td>
</tr>
<tr>
<td>total-size</td>
<td>string</td>
<td>The total size of the volume.</td>
</tr>
<tr>
<td>total-size-numeric</td>
<td>uint64</td>
<td>Unformatted total-size value in blocks.</td>
</tr>
<tr>
<td>allocated-size</td>
<td>string</td>
<td>The amount of space currently allocated to a virtual volume, or the total size of a linear volume.</td>
</tr>
<tr>
<td>allocated-size-numeric</td>
<td>uint64</td>
<td>Unformatted allocated-size value in blocks.</td>
</tr>
<tr>
<td>storage-type</td>
<td>string</td>
<td>- Linear: The volume is in a linear pool.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Virtual: The volume is in a virtual pool.</td>
</tr>
<tr>
<td>storage-type-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for storage-type values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Linear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Virtual</td>
</tr>
<tr>
<td>preferred-owner</td>
<td>string</td>
<td>Controller that owns the volume during normal operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A: Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- B: Controller B.</td>
</tr>
<tr>
<td>preferred-owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for preferred-owner values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: A</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>owner</td>
<td>string</td>
<td>Either the preferred owner during normal operation or the partner controller when the preferred owner is offline.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A : Controller A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- B : Controller B.</td>
</tr>
<tr>
<td>owner-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for owner values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: A</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>Volume serial number.</td>
</tr>
<tr>
<td>write-policy</td>
<td>string</td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td>write-policy-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for write-policy values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: write-through</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: write-back</td>
</tr>
<tr>
<td>cache-optimization</td>
<td>string</td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• no-mirror: In this mode of operation, the controller cache performs the same as the standard mode with the exception that the cache metadata is not mirrored to the partner. While this improves the response time of write I/O, it comes at the cost of redundancy. If this option is used, the user can expect higher write performance but is exposed to data loss if a controller fails.</td>
</tr>
<tr>
<td>cache-optimization-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cache-optimization values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: no-mirror</td>
</tr>
<tr>
<td>read-ahead-size</td>
<td>string</td>
<td>The volume's read-ahead cache setting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disabled: Read-ahead is disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adaptive: Adaptive read-ahead is enabled, which allows the controller to dynamically calculate the optimum read-ahead size for the current workload.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 512 KB, 1 MB, 2 MB, 4 MB, 8 MB, 16 MB, or 32 MB: Size selected by a user.</td>
</tr>
<tr>
<td>read-ahead-size-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for read-ahead-size values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2: Stripe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1: Adaptive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 0: Disabled</td>
</tr>
</tbody>
</table>
### Name | Type | Description
---|---|---
\*524288\*: 512 KB
\*1048576\*: 1 MB
\*2097152\*: 2 MB
\*4194304\*: 4 MB
\*8388608\*: 8 MB
\*16777216\*: 16 MB
\*33554432\*: 32 MB
\*2147483648\*: Maximum

volume-type | string | \*• base\*: Base volume
\*• standard\*: Standard volume.
\*• snapshot\*: Snapshot volume.

volume-type- numeric | uint32 | Numeric equivalents for volume-type values.
\*• 0\*: standard
\*• 3\*: snapshot
\*• 15\*: base

volume-class | string | \*1. \*: 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.
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| volume-qualifier | string     | • **0**: never-delete  
• **1**: high  
• **2**: medium  
• **3**: low  |
| raidtype         | string     | The RAID level of the disk group.  
• **NRAID**  
• **RAID0**  
• **RAID1**  
• **RAID3**  
• **RAID5**  
• **RAID6**  
• **RAID10**  
• **RAID50**  
• **ADAPT**  |
| raidtype-numeric | uint32     | Numeric equivalents for `raidtype` values.  
• **0**: RAID0  
• **1**: RAID1  
• **2**: ADAPT  
• **3**: RAID3  
• **5**: RAID5  
• **6**: NRAID  
• **8**: RAID50  
• **10**: RAID10  
• **11**: RAID6  |
| cs-replication-role | string | • **Copy Source**: The volume is the source for a volume copy operation.  
• **Copy Destination**: The volume is the destination for a volume copy operation.  
• **Primary**: The volume is the primary volume in a replication set.  
• **Secondary**: The volume is the secondary volume in a replication set.  
• (blank): Not applicable.  |
| cs-copy-dest     | string     | • **Off**: Not applicable.  
• **On**: The volume is the destination for a volume copy operation.  |
| cs-copy-dest-numeric | uint32 | Numeric equivalents for `cs-copy-dest` values.  
• **0**: Off  
• **1**: On  |
| cs-copy-src      | string     | • **Off**: Not applicable.  
• **On**: The volume is the source for a volume copy operation.  |
| cs-copy-src-numeric | uint32 | Numeric equivalents for `cs-copy-src` values.  
• **0**: Off  
• **1**: On  |
| cs-primary       | string     | • **Off**: Not applicable.  
• **On**: The volume is the primary volume in a replication set.  |
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cs-primary-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cs-primary values</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>cs-secondary</td>
<td>string</td>
<td>• Off: Not applicable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On: The volume is the secondary volume in a replication set.</td>
</tr>
<tr>
<td>cs-secondary-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for cs-secondary values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: On</td>
</tr>
<tr>
<td>health</td>
<td>string</td>
<td>• OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• N/A</td>
</tr>
<tr>
<td>health-numeric</td>
<td>uint32</td>
<td>Numeric equivalents for health values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: OK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: Degraded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4: N/A</td>
</tr>
<tr>
<td>health-reason</td>
<td>string</td>
<td>If Health is not OK, the reason for the health state.</td>
</tr>
<tr>
<td>health-recommendation</td>
<td>string</td>
<td>If Health is not OK, the recommended actions to take to resolve the health issue.</td>
</tr>
<tr>
<td>volume-group</td>
<td>string</td>
<td>If the volume is in a volume group, the name of the group. Otherwise, UNGROUPEDVOLUMES.</td>
</tr>
<tr>
<td>group-key</td>
<td>string</td>
<td>If the volume is in a volume group, the durable ID of the volume group. Otherwise, VGU.</td>
</tr>
</tbody>
</table>

**volume-statistics**

This basetype is used by show volume-statistics.

**Table 139. volume-statistics properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>volume-name</td>
<td>string</td>
<td>The name of the volume.</td>
</tr>
<tr>
<td>serial-number</td>
<td>string</td>
<td>The serial number of the volume.</td>
</tr>
<tr>
<td>bytes-per-second</td>
<td>string</td>
<td>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.</td>
</tr>
<tr>
<td>bytes-per-second- numeric</td>
<td>uint64</td>
<td>Unformatted bytes-per-second value.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>---------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>iops</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>number-of-reads</td>
<td>uint64</td>
<td>The number of read operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>number-of-writes</td>
<td>uint64</td>
<td>The number of write operations since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read</td>
<td>string</td>
<td>The amount of data read since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-read-numeric</td>
<td>uint64</td>
<td>Unformatted data-read value.</td>
</tr>
<tr>
<td>data-written</td>
<td>string</td>
<td>The amount of data written since these statistics were last reset or since the controller was restarted.</td>
</tr>
<tr>
<td>data-written-numeric</td>
<td>uint64</td>
<td>Unformatted data-written value.</td>
</tr>
<tr>
<td>allocated-pages</td>
<td>uint32</td>
<td>The number of pages allocated to the volume.</td>
</tr>
<tr>
<td>percent-tier-ssd</td>
<td>uint16</td>
<td>The percentage of volume capacity occupied by data in the Performance tier.</td>
</tr>
<tr>
<td>percent-tier-sas</td>
<td>uint16</td>
<td>The percentage of volume capacity occupied by data in the Standard tier.</td>
</tr>
<tr>
<td>percent-tier-sata</td>
<td>uint16</td>
<td>The percentage of volume capacity occupied by data in the Archive tier.</td>
</tr>
<tr>
<td>percent-allocated-rfc</td>
<td>uint16</td>
<td>The percentage of volume capacity occupied by data in read cache.</td>
</tr>
<tr>
<td>pages-alloc-per-minute</td>
<td>uint32</td>
<td>The average number of pages being allocated to the volume each minute.</td>
</tr>
<tr>
<td>pages-dealloc-per-minute</td>
<td>uint32</td>
<td>The average number of pages being deallocated from the volume each minute.</td>
</tr>
<tr>
<td>shared-pages</td>
<td>uint32</td>
<td>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.</td>
</tr>
<tr>
<td>write-cache-hits</td>
<td>uint64</td>
<td>For the controller that owns the volume, the number of times the block written to is found in cache.</td>
</tr>
<tr>
<td>write-cache-misses</td>
<td>uint64</td>
<td>For the controller that owns the volume, the number of times the block written to is not found in cache.</td>
</tr>
<tr>
<td>read-cache-hits</td>
<td>uint64</td>
<td>For the controller that owns the volume, the number of times the block to be read is found in cache.</td>
</tr>
</tbody>
</table>

**volume-view**

This basetype is used by **show maps**.

**Table 140. volume-view properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Volume ID in the format V#, where # starts at 1 and increments for each new volume to uniquely identify it. The value is generated from available data in the current CLI session and may change after a Management Controller restart.</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>volume-serial</td>
<td>string</td>
<td>The serial number of the volume.</td>
</tr>
<tr>
<td>volume-name</td>
<td>string</td>
<td>Volume name.</td>
</tr>
<tr>
<td>volume-view-mappings</td>
<td>Embedded;</td>
<td>see volume-view-mappings.</td>
</tr>
</tbody>
</table>

**volume-view-mappings**

This basetype is used by `show maps`.

**Table 141. volume-view-mappings properties**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>durable-id</td>
<td>string</td>
<td>Mapping ID.</td>
</tr>
<tr>
<td>parent-id</td>
<td>string</td>
<td>For a mapping between a volume and an initiator, the volume ID-or if the volume is a member of a volume group, the volume-group ID.</td>
</tr>
<tr>
<td>mapped-id</td>
<td>string</td>
<td>The ID of the mapping target, such as an initiator.</td>
</tr>
<tr>
<td>ports</td>
<td>string</td>
<td>The controller host ports to which the mapping applies.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blank if not mapped or mapped as <code>no-access</code></td>
</tr>
<tr>
<td>lun</td>
<td>string</td>
<td>The LUN that identifies the volume to a host.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For a volume group, * means multiple LUNs are represented in the group.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blank if not mapped or mapped as <code>no-access</code>.</td>
</tr>
<tr>
<td>access</td>
<td>string</td>
<td>Type of host access to the volume.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>read-write</code>: Read and write.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>read-only</code>: Read only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>no-access</code>: No access (masked).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <code>not-mapped</code>: Not mapped.</td>
</tr>
<tr>
<td>access-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of <code>access</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0: <code>not-mapped</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1: <code>no-access</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2: <code>read-only</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3: <code>read-write</code></td>
</tr>
<tr>
<td>identifier</td>
<td>string</td>
<td>For a SAS initiator, its WWPN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For an FC initiator, its WWPN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For an iSCSI initiator, its node name (typically the IQN).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For all other initiators: The volume’s default mapping.</td>
</tr>
<tr>
<td>nickname</td>
<td>string</td>
<td>For a host, its name in the format <code>host-name.*</code>, where the * represents all initiators in the host.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For a host group, its name in the format <code>host-group.*.*</code>, where the first * represents all hosts in the host group and the second * represents all initiators in those hosts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blank if not set or for all other initiators.</td>
</tr>
<tr>
<td>host-profile</td>
<td>string</td>
<td>Standard: Default profile.</td>
</tr>
<tr>
<td>host-profile-numeric</td>
<td>uint32</td>
<td>Numeric equivalents of <code>host-profile</code> values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0: Standard</td>
</tr>
</tbody>
</table>
This appendix summarizes the system settings that result from using the `restore defaults` command.

### Table 142. Settings changed by restore defaults

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System information settings:</strong></td>
<td></td>
</tr>
<tr>
<td>System name</td>
<td>Uninitialized Name</td>
</tr>
<tr>
<td>System contact</td>
<td>Uninitialized Contact</td>
</tr>
<tr>
<td>System location</td>
<td>Uninitialized Location</td>
</tr>
<tr>
<td>System information</td>
<td>Uninitialized Info</td>
</tr>
<tr>
<td><strong>Management protocols settings:</strong></td>
<td></td>
</tr>
<tr>
<td>CLI/Telnet</td>
<td>Disabled</td>
</tr>
<tr>
<td>CLI/SSH</td>
<td>Enabled</td>
</tr>
<tr>
<td>SLP</td>
<td>Enabled</td>
</tr>
<tr>
<td>FTP</td>
<td>Disabled</td>
</tr>
<tr>
<td>SFTP</td>
<td>Enabled</td>
</tr>
<tr>
<td>SNMP</td>
<td>Disabled</td>
</tr>
<tr>
<td>WBI/HTTP</td>
<td>Disabled</td>
</tr>
<tr>
<td>WBI/HTTPS</td>
<td>Enabled</td>
</tr>
<tr>
<td>SMI-S</td>
<td>Disabled</td>
</tr>
<tr>
<td>Unsecure SMI-S</td>
<td>Disabled</td>
</tr>
<tr>
<td>Debug</td>
<td>Disabled</td>
</tr>
<tr>
<td>In-band SES</td>
<td>Disabled</td>
</tr>
<tr>
<td>Activity Progress Reporting</td>
<td>Disabled</td>
</tr>
<tr>
<td><strong>Management mode</strong></td>
<td>v3</td>
</tr>
<tr>
<td><strong>Users</strong></td>
<td>(preserved)</td>
</tr>
<tr>
<td><strong>CLI session timeout</strong></td>
<td>30 minutes</td>
</tr>
<tr>
<td><strong>Tasks and schedules</strong></td>
<td>(preserved)</td>
</tr>
<tr>
<td><strong>Management Controller debug logs</strong></td>
<td>(preserved)</td>
</tr>
<tr>
<td><strong>Storage Controller event logs</strong></td>
<td>(preserved)</td>
</tr>
<tr>
<td><strong>Time/date and NTP settings</strong></td>
<td>(preserved)</td>
</tr>
<tr>
<td><strong>Network IP settings</strong></td>
<td>(preserved)</td>
</tr>
<tr>
<td><strong>SNMP settings:</strong></td>
<td></td>
</tr>
<tr>
<td>SNMP trap notification level</td>
<td>none</td>
</tr>
<tr>
<td>SNMP trap host IPs</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>SNMP read community</td>
<td>public</td>
</tr>
<tr>
<td>SNMP write community</td>
<td>public</td>
</tr>
<tr>
<td>Email notification</td>
<td>Disabled</td>
</tr>
<tr>
<td>Email notify filter</td>
<td>(none)</td>
</tr>
<tr>
<td>Email addresses</td>
<td>(none)</td>
</tr>
<tr>
<td>Email server</td>
<td>(none)</td>
</tr>
<tr>
<td>Email domain</td>
<td>(none)</td>
</tr>
<tr>
<td>Email sender</td>
<td>(none)</td>
</tr>
<tr>
<td>Include logs</td>
<td>Disabled</td>
</tr>
<tr>
<td>Setting</td>
<td>Value</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>SSL/SSH certificates</td>
<td>(preserved)</td>
</tr>
<tr>
<td>License</td>
<td>(preserved)</td>
</tr>
<tr>
<td>Disk group metadata</td>
<td>(preserved)</td>
</tr>
<tr>
<td>Host port settings:</td>
<td>Settings:</td>
</tr>
<tr>
<td>• FC link speed</td>
<td>• Auto</td>
</tr>
<tr>
<td>• FC topology</td>
<td>• Point-to-point</td>
</tr>
<tr>
<td>Host names and profiles</td>
<td>(preserved)</td>
</tr>
<tr>
<td>Drive spin down</td>
<td>Disabled</td>
</tr>
<tr>
<td>Advanced settings:</td>
<td>Settings:</td>
</tr>
<tr>
<td>• Disk group background scrub</td>
<td>• Enabled</td>
</tr>
<tr>
<td>• Disk group background scrub interval</td>
<td>• 24 hours</td>
</tr>
<tr>
<td>• Partner firmware upgrade</td>
<td>• Enabled</td>
</tr>
<tr>
<td>• Utility priority</td>
<td>• Low</td>
</tr>
<tr>
<td>• SMART</td>
<td>• Enabled</td>
</tr>
<tr>
<td>• Dynamic spare configuration</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Enclosure polling rate</td>
<td>• 5 seconds</td>
</tr>
<tr>
<td>• Host control of caching</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Sync cache mode</td>
<td>• Immediate</td>
</tr>
<tr>
<td>• Independent Cache mode</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Missing LUN response</td>
<td>• Illegal request</td>
</tr>
<tr>
<td>• Controller failure</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Supercap failure</td>
<td>• Enabled</td>
</tr>
<tr>
<td>• CompactFlash failure</td>
<td>• Enabled</td>
</tr>
<tr>
<td>• Power supply failure</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Fan failure</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Temperature exceeded</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Partner notify</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Auto write back</td>
<td>• Enabled</td>
</tr>
<tr>
<td>• Inactive drive spin down</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Inactive drive spin down delay</td>
<td>• 15 minutes</td>
</tr>
<tr>
<td>• Disk background scrub</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Managed logs</td>
<td>• Disabled</td>
</tr>
<tr>
<td>• Single controller mode</td>
<td>• Disabled (for a dual-controller system)</td>
</tr>
<tr>
<td>• Auto stall recovery</td>
<td>• Enabled</td>
</tr>
<tr>
<td>• Restart on CAPI fail</td>
<td>• Enabled</td>
</tr>
<tr>
<td>• Large pools</td>
<td>• Disabled</td>
</tr>
<tr>
<td>FDE settings</td>
<td>(preserved)</td>
</tr>
</tbody>
</table>