AssuredSAN 3000 Series
CLI Reference Guide

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About this guide

This guide provides information about managing an AssuredSAN™ 3000 Series storage system by using its command-line interface (CLI).

Intended audience

This guide is intended for storage system administrators.

Prerequisites

Prerequisites for using this product include knowledge of:

- Network administration
- Storage system configuration
- Storage area network (SAN) management and direct attach storage (DAS)
- Fibre Channel, Serial Attached SCSI (SAS), Internet SCSI (iSCSI), and Ethernet protocols

Related documentation

For information about	**See**
Enhancements, known issues, and late-breaking information not included in product documentation	Release Notes
Overview of product shipkit contents and setup tasks	Getting Started*
Regulatory compliance and safety and disposal information	AssuredSAN Product Regulatory Compliance and Safety*
Installing and using optional host-based software components (CAPI Proxy, MPIO DSM, VDS Provider, VSS Provider, SES Driver)	AssuredSAN Installing Optional Software for Microsoft Windows® Server
Recommendations for using optional data-protection features (AssuredSnap, AssuredCopy, AssuredRemote)	AssuredSAN 3000 Series Using Data Protection Software
Using a rackmount bracket kit to install an enclosure into a rack	AssuredSAN Rackmount Bracket Kit Installation* *or* AssuredSAN 2-Post Rackmount Bracket Kit Installation*
Product hardware setup and related troubleshooting	AssuredSAN 3000 Series Setup Guide
Obtaining and installing a license to use licensed features	AssuredSAN 3000 Series Obtaining and Installing a License Certificate File
Using the web interface to configure and manage the product	AssuredSAN 3000 Series RAIDar User Guide
Using the command-line interface (CLI) to configure and manage the product	AssuredSAN 3000 Series CLI Reference Guide
Event codes and recommended actions	AssuredSAN Event Descriptions Reference Guide
Identifying and installing or replacing field-replaceable units (FRUs)	AssuredSAN 3000 Series FRU Installation and Replacement Guide

* Printed document included in product shipkit.

For additional information, see Dot Hill's Customer Resource Center web site: http://crc.dothill.com.

Document conventions and symbols

Table 1 Document conventions

Convention	Element
Blue text	Cross-reference links and e-mail addresses
Blue, underlined text	Web site addresses
Bold font	• Key names • Text typed into a GUI element, such as into a box • GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes
Italics font	Text emphasis
`Monospace font`	• File and directory names • System output • Code • Text typed at the command-line
`Monospace, italic font`	• Code variables • Command-line variables
`Monospace, bold font`	Emphasis of file and directory names, system output, code, and text typed at the command line

△ **CAUTION:** Indicates that failure to follow directions could result in damage to equipment or data.

IMPORTANT: Provides clarifying information or specific instructions.

NOTE: Provides additional information.

TIP: Provides helpful hints and shortcuts.

1 Using the CLI

This chapter introduces the AssuredSAN 3000 Series command-line interface (CLI).

Accessing the CLI

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

- By using HTTP, HTTPS, Telnet, an SSH application, or a terminal emulator on a management host that is remotely connected through a LAN to a controller module's network port. See your product's Setup Guide for information about setting management port IP addresses using the CLI.
- By using a terminal emulator on a management host that is directly connected to a controller module's serial CLI port.

NOTE: Using HyperTerminal on a Microsoft Windows host with the CLI:

- On a host connected to a controller module's mini-USB CLI port, incorrect command syntax in a HyperTerminal session can cause the CLI to hang. To avoid this problem, use correct syntax, use a different terminal emulator, or connect to the CLI using telnet rather than the mini-USB cable.
- Close the HyperTerminal session before shutting down the controller or restarting its Management Controller; otherwise the host's CPU cycles may rise unacceptably.

Table 2 Default usernames and passwords

Username	Password	Roles
`monitor`	`!monitor`	Monitor (view only)
`manage`	`!manage`	Monitor, Manage (view and change)

CLI output formats

The CLI has two output formats:

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

XML API format enables any external application to interact with the storage system. The XML format is constructed to permit new fields to be added without impacting existing clients if they follow standard XML parsing conventions. The XML format also contains alternate fields for values which may be localized, such as a state value. These values are guaranteed not to change with different languages and can be used for scripting.

Scripting is not supported using console format because labels, field sizes, and order of fields may change in future firmware releases. To properly script CLI commands use XML 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 XML output will not impact a conventional XML parsing engine.

You can change the CLI output format by using the set cli-parameters command; see Example on page 139.

Using CLI interactively

By default the CLI is an interactive application. When you are logged into the CLI, the CLI waits for a command to be entered and then responds to it.

The following example shows interactively starting a Telnet session, logging into the CLI, executing a command to show free (available) disks, and exiting the CLI:

```
$: telnet 172.22.5.55
172.22.5.55 login: monitor
Password: ********

product
System Name: Test
System Location: Lab
Version: version
# show disks free
Location Serial Number         Vendor   Rev   How Used   Type   Size
  Rate*(Gb/s) SP Health     Health Reason
-------------------------------------------------------------------------------
0.2      SN                    vendor   rev   AVAIL      SAS    146.8GB
  3.0            OK
-------------------------------------------------------------------------------
Info: * Rates may vary. This is normal behavior.

Success: Command completed successfully. (2011-10-20 12:46:41)

# exit
```

Using a script to access the CLI

The following example shows how to construct a Perl script to communicate with the CLI via Telnet. `cLogin` is called at the start of the script to log a user into the CLI. The script uses the command-line parameters specified as the IP address, username, and password. After the user has been logged in, other commands can be sent to the CLI.

```
use Net::Telnet;
sub cLogin {
    $telnet->open($_[0]);
    $telnet->waitfor(/(login|username)[: ]*$/i);
    $telnet->print("$_[1]");
    $telnet->waitfor(/password[: ]*$/i);
    $telnet->print("$_[2]");
    # either got a login or a prompt
    @ok = $telnet->waitfor(/(#|login:*) /i);
    if ($debug_commands == 1) { print "-"; print @ok; print "-\n"; }
    if ($ok[1] =~ m/login/gi)
    {
        return 0;
    }
    else
    {
        return 1;
    }
}
$ipAddr = $ARGV[0];
$username = $ARGV[1];
$password = $ARGV[2];
$telnet = new Net::Telnet ( Timeout=>10,
Errmode=>'die',
Prompt => '/\# $/i');
```

```
if ( !cLogin($ipAddr, $username, $password) == 1 )
{
   print("Error: $username user failed to log in. Exiting.\n");
   $telnet->close;
   exit(0);
}
```

For scripting support, the following command can be used to access the XML API and to disable the paging mode that pauses for each full screen of command output.

```
$telnet->cmd("set cli-parameters api-embed pager disabled");
```

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

```
@sV = $telnet->cmd("show configuration");
for ($i=0; $i<scalar(@sV); $i++)
{
   print ("@sV[ $i ]");
}
```

Because basic command-line semantics provide prompts for user input and response time is indeterminate, scripts must use an "expect"-type mechanism to scan output for prompts. It is more efficient to use the HTTP interface to access the XML API. The following example shows how to construct a Perl script to communicate with the XML API via HTTP.

```
use LWP::UserAgent;
use Digest::MD5 qw(md5_hex);
use XML::LibXML;

# generate MD5 hash using default username/password
my $md5_data = "manage_!manage";
my $md5_hash = md5_hex( $md5_data );
print "$md5_hash\n";

# create the URL and send an http GET request

$ua = LWP::UserAgent->new;
$url = 'http://10.0.0.2/api/login/' . $md5_hash;

print ("Sending to $url\n");
$req = HTTP::Request->new(GET => $url);

$res = $ua->request($req);

# Parse the XML content using LibXML to obtain the session key

print $res->content;

my $parser = XML::LibXML->new();
my $doc = $parser->parse_string( $res->content );

my $root = $doc->getDocumentElement;
my @objects = $root->getElementsByTagName('OBJECT');
my @props = $objects[0]->getElementsByTagName('PROPERTY');

my $sessionKey;

foreach my $prop ( @props ) {
    my $name = $prop->getAttribute('name');

    print "Property = " . $name . "\n";
```

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

print "Session Key = $sessionKey\n";

# Run a sample command to obtain the disks in the system.

$url = 'http://10.0.0.2/api/show/disks';
$req = HTTP::Request->new(GET => $url);
$req->header('sessionKey' => $sessionKey );
$req->header('dataType' => 'ipa' );

$res = $ua->request($req);

$url2 = 'http://10.0.0.2/api/exit';
$req2 = HTTP::Request->new(GET => $url3);
$req2->header('sessionKey' => $sessionKey );
$req2->header('dataType' => 'api' );

$res2 = $ua->request($req2);

print $res->content;
```

The next section provides more information about using the XML API.

Using the XML API

The Management Controller provides access for monitoring and management via the Telnet and SSH protocols for command-line interface semantics, or via 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 XML parser should use the Document Type Definition (DTD) version that corresponds to the firmware level to ensure that the XML is validated. The DTD provides the structure of all content returned by the CLI when XML API format is enabled. By obtaining the latest DTD for validation, the parser will be forward compatible. To obtain the DTD, go to crc.dothill.com.

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 3 XML API elements

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

Scripting guidelines

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

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 XML API status object:

```
<OBJECT basetype="status" name="status" oid="1">
    <PROPERTY name="response-type" type="string" size="12" draw="false"
sort="nosort" display-name="Response Type">Success</PROPERTY>
    <PROPERTY name="response-type-numeric" type="uint32" size="12" draw="false"
sort="nosort" display-name="Response Type">0</PROPERTY>
    <PROPERTY name="response" type="string" size="180" draw="true" sort="nosort"
display-name="Response">Command completed successfully.</PROPERTY>
    <PROPERTY name="return-code" type="sint32" size="15" draw="false"
sort="nosort" display-name="Return Code">0</PROPERTY>
    <PROPERTY name="component-id" type="string" size="80" draw="false"
sort="nosort" display-name="Component ID"></PROPERTY>
    <PROPERTY name="time-stamp" type="string" size="25" draw="false"
sort="datetime" display-name="Time">2010-08-10 11:32:29</PROPERTY>
    <PROPERTY name="time-stamp-numeric" type="uint32" size="25" draw="false"
sort="datetime" display-name="Time">1281439949</PROPERTY>
</OBJECT>
```

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.

XML API examples

The following example shows the same command, formatted for use with the command-line interface or for use with the HTTP interface, and its XML API output.

- Command-line interface format: `create vdisk level r5 disks 2.6,2.7,2.8 vd-1`
- HTTP interface format: `create/vdisk/level/r5/disks/2.6,2.7,2.8/vd-1`

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<RESPONSE VERSION="L100">
<OBJECT basetype="status" name="status" oid="1">
    <PROPERTY name="response-type" type="string" size="12" draw="false"
sort="nosort" display-name="Response Type">Success</PROPERTY>
    <PROPERTY name="response-type-numeric" type="uint32" size="12" draw="false"
sort="nosort" display-name="Response Type">0</PROPERTY>
    <PROPERTY name="response" type="string" size="180" draw="true" sort="nosort"
display-name="Response">Command completed successfully. (vd-1) - The vdisk was
created.</PROPERTY>
    <PROPERTY name="return-code" type="sint32" size="15" draw="false"
sort="nosort" display-name="Return Code">0</PROPERTY>
    <PROPERTY name="component-id" type="string" size="80" draw="false"
sort="nosort" display-name="Component ID">vd-1</PROPERTY>
    <PROPERTY name="time-stamp" type="string" size="25" draw="false"
sort="datetime" display-name="Time">2010-08-10 12:07:18</PROPERTY>
    <PROPERTY name="time-stamp-numeric" type="uint32" size="25" draw="false"
sort="datetime" display-name="Time">1281442038</PROPERTY>
</OBJECT>
</RESPONSE>
```

XML API optimization

The following are two ways to optimize XML API 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.

In the following example, which uses brief mode, embedded objects contain media-specific detail for ports:

```
# show ports
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<RESPONSE VERSION="L100">
  <OBJECT basetype="port" name="name" oid="1" format="rows">
    <PROPERTY name="durable-id">hostport_A0</PROPERTY>
    <PROPERTY name="controller" key="true">A</PROPERTY>
    <PROPERTY name="controller-numeric" key="true">1</PROPERTY>
    <PROPERTY name="port" key="true">A0</PROPERTY>
    <PROPERTY name="port-type" type="string">FC</PROPERTY>
    <PROPERTY name="port-type-numeric" type="string">6</PROPERTY>
    <PROPERTY name="media">FC(-)</PROPERTY>
    <PROPERTY name="target-id">target-ID</PROPERTY>
    <PROPERTY name="status">Disconnected</PROPERTY>
    <PROPERTY name="status-numeric">6</PROPERTY>
    <PROPERTY name="actual-speed"></PROPERTY>
    <PROPERTY name="actual-speed-numeric">255</PROPERTY>
    <PROPERTY name="configured-speed">Auto</PROPERTY>
    <PROPERTY name="configured-speed-numeric">3</PROPERTY>
    <PROPERTY name="health">N/A</PROPERTY>
    <PROPERTY name="health-numeric">4</PROPERTY>
    <PROPERTY name="health-reason">There is no host connection to this host
port.</PROPERTY>
    <PROPERTY name="health-recommendation">- No action is required.</PROPERTY>
    <OBJECT basetype="fc-port" name="port-details" oid="2" format="rows">
      <PROPERTY name="configured-topology">Loop</PROPERTY>
      <PROPERTY name="primary-loop-id">0</PROPERTY>
    </OBJECT>
  </OBJECT>
  <OBJECT basetype="port" name="name" oid="3" format="rows">
    <PROPERTY name="durable-id">hostport_A1</PROPERTY>
    ...
  </OBJECT>
  <OBJECT basetype="status" name="status" oid="5">
    <PROPERTY name="response-type">Success</PROPERTY>
    <PROPERTY name="response-type-numeric">0</PROPERTY>
    <PROPERTY name="response">Command completed successfully.</PROPERTY>
    <PROPERTY name="return-code">0</PROPERTY>
    <PROPERTY name="component-id"></PROPERTY>
    <PROPERTY name="time-stamp">2012-01-27 12:11:10</PROPERTY>
    <PROPERTY name="time-stamp-numeric">1281442270</PROPERTY>
  </OBJECT>
</RESPONSE>
```

Command syntax

Command names and parameters

Command 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. These values are not case sensitive.

Parameter values in italics are variables. Substitute text that is appropriate for the task you want to perform. Variable values such names of users and volumes are case sensitive and have a maximum length in bytes. ASCII characters are 1 byte; most Latin (Western European) characters with diacritics are 2 bytes; most Asian characters are 3 bytes.

Unless otherwise specified, a parameter value can include printable UTF-8 characters except angle brackets (<>), backslash (\), comma (,), and double quotes ("). A parameter value that includes a space must be enclosed in double quotes.

Parameters can be entered in any order. However, if the value of a parameter with no keyword is the same as the keyword of an optional parameter, the optional parameter must precede the value. For example, to create a vdisk named `spare`, the `spare` parameter must precede the name value **`spare`**:
`create vdisk level raid5 disks 1.10-12 spare 1.7` **`spare`**

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: `0.4`
- A hyphenated range of disks. Example: `0.4-7`
- A comma-separated list of individual disks, ranges, or both (with no spaces). Example: `0.4,0.6-9`
- A RAID 10 or 50 vdisk, with disks in sub-vdisks separated by colons (with no spaces). RAID-50 example: `0.1-3:0.4-6:0.7,0.10-11`

Vdisks

You can specify:

- A vdisk by its name or serial number. A unique serial number is automatically assigned when a vdisk is created, and does not change for the life of the vdisk.
- A list of vdisk names or serial numbers separated by commas (with no spaces). Not all commands support lists. List example: `vd1,"My vdisk"`

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"`

Ports

Controller host ports are specified by controller ID and port number, and are not case sensitive. Controller IDs are A for the upper controller and B for the lower controller. Port IDs increment from 0 in each controller module. You can specify:

- A port ID. Example: `A1`
- A hyphenated range of IDs. Do not mix controller IDs in a range. Example: `b0-b1`
- A comma-separated list of IDs, ranges, or both (with no spaces). Example: `A1,b0-b1`

Command completion, editing, and history

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

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

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

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

Table 4 Keyboard shortcuts for command completion, editing, and history

To	Press
Complete a partially entered keyword	**Tab** or **Ctrl+i**
Show command history	F6
Get previous command from history	**Up Arrow**
Get next command from history	**Down Arrow**
Move cursor left	**Left Arrow**
Move cursor right	**Right Arrow**
Delete previous character	**Backspace**

Viewing help

To view brief descriptions of all commands that are available to the user level you logged in as, enter:

```
help
```

To view help for a command and then return to the command prompt, enter:

```
help command-name
```

To view the information shown in Command syntax above, enter:

```
help syntax
```

To view the information shown in this topic and in Command completion, editing, and history above, enter:

```
help help
```

Size representations

Parameters such as names of users and volumes have a maximum length in bytes. ASCII characters are 1 byte; most Latin (Western European) characters with diacritics are 2 bytes; most Asian characters are 3 bytes.

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 5 Size representations in base 2 and base 10

Base 2		Base 10	
Unit	**Size in bytes**	**Unit**	**Size in bytes**
KiB (kibibyte)	1,024	KB (kilobyte)	1,000
MiB (mebibyte)	$1,024^2$	MB (megabyte)	$1,000^2$
GiB (gibibyte)	$1,024^3$	GB (gigabyte)	$1,000^3$
TiB (tebibyte)	$1,024^4$	TB (terabyte)	$1,000^4$
PiB (pebibyte)	$1,024^5$	PB (petabyte)	$1,000^5$
EiB (exbibyte)	$1,024^6$	EB (exabyte)	$1,000^6$

The locale setting determines the character used for the decimal (radix) point, as shown below.

Table 6 Decimal (radix) point character by locale

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

Event log

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

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

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

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

2 Categorical list of commands

This chapter helps you find a command within a category of functionally related commands. A command might appear in more than one category.

Table 7 Commands by category

Category	Commands	
CLI and users	create user	set password
	delete user	set prompt
	exit	set user
	help (see Viewing help)	show cli-parameters
	set cli-parameters	show users
Disks, vdisks, and spares	abort scrub	scrub disks
	abort verify	scrub vdisk
	clear disk-metadata	set expander-fault-isolation
	create vdisk	set led
	delete global-spare	set spares
	delete vdisks	set vdisk
	delete vdisk-spare	show disks
	dequarantine	show vdisks
	expand vdisk	trust
	rescan	verify vdisk
Volumes, hosts, and mapping	create host	show cache-parameters
	create volume	show host-maps
	create volume-set	show hosts
	delete host	show ports
	delete volumes	show unwritable-cache
	expand volume	show volume-maps
	map volume	show volume-names
	release volume	show volume-reservations
	set cache-parameters	show volumes
	set host-name	unmap volume
	set volume	

Table 7 Commands by category (continued)

Category	Commands	
Snapshots	convert master-to-std	expand snap-pool
	convert std-to-master	reset snapshot
	create master-volume	rollback master-volume
	create snap-pool	set priorities
	create snapshots	set snap-pool-policy
	delete all-master-volumes	set snap-pool-threshold
	delete all-snapshots	show master-volumes
	delete master-volume	show priorities
	delete snap-pool	show snap-pools
	delete snapshot	show snapshots
	delete snapshot-write-data	
Volume copy	abort volumecopy	volumecopy
	show volumecopy-status	
Scheduled tasks	create schedule	set task
	create task	show schedule-details
	delete schedule	show schedules
	delete task	show task-details
	set schedule	show tasks
Event notification	set email-parameters	show events
	set snmp-parameters	show snmp-parameters
	show email-parameters	test

Table 7 Commands by category (continued)

Category	Commands	
System configuration and utilities	clear cache	show configuration
	create certificate	show controller-date
	create chap-record	show controllers
	delete chap-records	show disk-parameters
	ping	show enclosures
	reset host-link	show enclosure-status
	restart	show expander-status
	set advanced-settings	show fans
	set auto-write-through-trigger	show frus
	set awt	show host-parameters
	set chap-record	show inquiry
	set controller-date	show iscsi-parameters
	set disk-parameters	show job-parameters
	set enclosure	show license
	set expander-fault-isolation	show network-parameters
	set expander-phy	show ntp-status
	set host-parameters	show ports
	set iscsi-parameters	show power-supplies
	set job-parameters	show protocols
	set led	show redundancy-mode
	set network-parameters	show sas-link-health
	set ntp-parameters	show sensor-status
	set protocols	show shutdown-status
	set system	show system
	show advanced-settings	show system-parameters
	show auto-write-through-trigger	show versions
	show awt	shutdown
	show certificate	versions
	show chap-records	
Service utilities	clear events	set expander-fault-isolation
	clear expander-status	set expander-phy
	reset smis-configuration	show debug-log-parameters
	restore defaults	show expander-status
	set debug-log-parameters	
API specific	meta	show refresh-counters
Remote systems	create remote-system	show remote-systems
	delete remote-system	verify links
	remote	verify remote-link
	set remote-system	

Table 7 Commands by category (continued)

Category	Commands	
Remote replication	abort replication	resume replication
	add replication-volume	set replication-primary-volume
	create replication-set	set replication-volume-parameters
	delete replication-set	show replication-images
	detach replication-volume	show replication-sets
	export snapshot	show replication-volumes
	reattach replication-volume	start vdisk
	remove replication-volume	stop vdisk
	replicate snapshot	suspend replication
	replicate volume	
Statistics	reset all-statistics	reset volume-statistics
	reset controller-statistics	show controller-statistics
	reset disk-error-statistics	show disk-statistics
	reset disk-statistics	show host-port-statistics
	reset host-port-statistics	show vdisk-statistics
	reset vdisk-statistics	show volume-statistics

The following commands have either been replaced by newer commands or removed.

Table 8 Replaced or removed commands

Old command	New command
clear disk metadata	clear disk-metadata
create host-name	create host
create host-wwn-name	create host
create iscsi-host	create host
delete host-wwn-name	delete host
delete iscsi-host	delete host
expand master-volume	expand volume
reset host-channel-link	reset host-link
set drive-parameters	set disk-parameters
set global-spare	set spares
set host-port-interconnects	None
set host-wwn-name	set host-name
set iscsi-host	set host-name
set output-format	set cli-parameters
set replication-external-view	set replication-primary-volume
set snap-pool policy	set snap-pool-policy
set snap-pool threshold	set snap-pool-threshold
set vdisk-spare	set spares
show channels	show ports

Table 8 Replaced or removed commands (continued)

Old command	New command
show drive-parameters	show disk-parameters
show enclosure-status	show enclosures, show frus, show sensor-status
show host-port-interconnects	None
show host-wwn-names	show hosts
show iscsi-hosts	show hosts
show lun-maps	show volume-maps
show output-format	show cli-parameters
show port-wwn	show ports

3 Alphabetical list of commands

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

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

abort replication

Description Aborts the current replication operation on the specified secondary volume. The current replication may be running or suspended. This command must be issued on the system that owns the secondary volume.

Syntax

```
abort replication
    [set replication-set]
    replication-volume
```

Parameters

`set` *`replication-set`*
Optional. Name or serial number of the replication set.

`replication-volume`
Name or serial number of the secondary volume. If the name is not unique across replication sets, specify the set parameter.

Example Abort replication of primary volume `V1` to secondary volume `rV1`:

```
# abort replication rV1
Success: Command completed successfully. (2012-01-20 14:52:27)
```

See also

- resume replication
- suspend replication
- show replication-sets
- show replication-volumes

abort scrub

Description Aborts a `scrub vdisk` operation for specified vdisks or disks.

Syntax

```
abort scrub
    [vdisk vdisks]
    [disks disks]
```

Parameters

`vdisk` *`vdisks`*
Optional. Names or serial numbers of the vdisks to stop scrubbing. For vdisk syntax, see Command syntax on page 20.

`disks` *`disks`*
Optional. IDs of the disks to stop scrubbing. For disk syntax, see Command syntax on page 20.

Example Abort scrubbing vdisk `vd1`:

```
# abort scrub vdisk vd1
Info: Scrub was aborted on vdisk vd1. (vd1)
Success: Command completed successfully. (2012-01-20 15:42:08)
```

Abort scrubbing disk 1.15:

```
# abort scrub disks 1.15
Info: Abort scrubbing the disk at location -  (1.15)
Success: Command completed successfully. (2012-10-08 11:27:29)
```

See also

- scrub disks
- scrub vdisk
- show disks
- show vdisks

abort verify

Description Aborts the `verify vdisk` operation for specified vdisks.

Syntax `abort verify vdisk vdisks`

Parameters `vdisk vdisks`
Names or serial numbers of the vdisks to stop verifying. For vdisk syntax, see Command syntax on page 20.

Example Abort verifying vdisk `vd1`:

```
# abort verify vdisk vd1
Info: The verify was aborted on vdisk vd1. (vd1) (2012-01-20 15:40:31)
Success: Command completed successfully. (2012-01-20 15:40:31)
```

See also
- show vdisks
- verify vdisk

abort volumecopy

Description Aborts copying a volume. When the abort is complete, the destination volume is deleted.

Syntax `abort volumecopy volume`

Parameters *volume*
Name or serial number of the source volume, the destination volume, or if a snapshot is being copied, its associated master volume. For volume syntax, see Command syntax on page 20.

Example Abort creating destination volume `vd1_copy`:

```
# abort volumecopy v1_copy
Success: Command completed successfully. (vd1_copy) - The volume copy was
aborted. (2012-01-21 12:04:20)
```

See also

- show volumecopy-status
- show volumes
- volumecopy

add replication-volume

Description Adds an existing secondary volume to a replication set. The volume can be on the same system as the primary volume or on a remote system.

A secondary volume is a master volume created specifically for use as the destination for a replication by using the create master-volume command's `prepare-replication-volume` parameter.

Secondary volumes serve as the destination for replicated data from the primary volume. When a replicate snapshot or replicate volume command is issued, data is replicated from the primary volume to the associated secondary volume in the replication set.

This command must be run on the primary system.

Syntax

```
add replication-volume
   link-type FC|iSCSI
   [max-queue #]
   [nowait]
   primary-volume volume
   [priority low|medium|high]
   [remote-system system]
   secondary-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs
   [set replication-set]
   replication-volume
```

Parameters

`link-type FC|iSCSI`
Specifies the type of ports being used for the inter-system link:

- `FC`: FC ports
- `iSCSI`: iSCSI ports

`max-queue #`
Optional. Number of replication images to consider when determining the next image to replicate: 1–64. Used only if the `on-collision` parameter is set to `oldest`.

`nowait`
Optional. Adding a volume to a replication set can take the Storage Controller several minutes to complete. This parameter allows that processing to continue in the background so the Management Controller can process other commands.

`primary-volume volume`
Name or serial number of the replication volume to be the primary volume for the replication set.

`priority low|medium|high`
Optional. Priority of the replication process on the replication volume: low, medium, or high.

`remote-system system`
Optional for a local volume; required for a remote volume if the `secondary-address` parameter is not specified. Name or network-port IP address of the remote system.

`secondary-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs`
Optional for a local volume; required for a remote volume if the `remote-system` parameter is not specified. Specifies host ports on the remote 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.

`set replication-set`
Optional. Name or serial number of the replication set.

`replication-volume`
Name or serial number of the secondary volume to add. If the name is not unique across replication sets, specify the `set` parameter.

Example Add secondary volume `MV2` to the replication set whose primary volume is `MV1`; set the replication priority to high; and allow a maximum of 2 queued images to be considered for replication:

```
# add replication-volume link-type FC secondary-address
wwpn=207000c0ffd52c31,217000c0ff52c31 primary-volume MV1 priority high max-queue
2 MV2
Info: Started adding the secondary volume to the replication set. (MV2)
Info: Verifying that the secondary volume was added to the replication set. This
may take a couple of minutes... (MV2)
Info: The secondary volume was added to the replication set. (MV2)
Success: Command completed successfully. (2012-01-21 17:37:40)
```

Add secondary volume `LosAngeles` to a replication set that uses iSCSI links and whose primary volume is `NewYork`:

```
# add replication-volume LosAngeles primary-volume NewYork link-type iSCSI
secondary-address ip=10.134.69.5,10.134.69.6
```

See also

- show replication-sets
- show replication-volumes

clear cache

Description Clears unwritable cache data from both controllers. 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.

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

Syntax `clear cache [volume volume]`

Parameters `volume volume`
Optional. Name or serial number of the volume whose cache data should be cleared. For volume syntax, see Command syntax on page 20. If this parameter is omitted, the command clears any unneeded orphaned data for volumes that are no longer online or that no longer exist.

Example Clear unwritable cache data for volume `V1` from both controllers:

```
# clear cache volume v1
Success: Command completed successfully - If unwritable cache data existed, it
has been cleared. (2012-01-18 14:21:11)
```

clear disk-metadata

Description Clears metadata from leftover disks.

△ **CAUTION:**

- Only use this command when all vdisks are online and leftover disks exist. Improper use of this command may result in data loss.
- Do not use this command when a vdisk is offline and one or more leftover disks exist.

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

Each disk in a vdisk has metadata that identifies the owning vdisk, the other members of the vdisk, and the last time data was written to the vdisk. The following situations cause a disk to become a *leftover*:

- Vdisk 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 vdisk, causing the vdisk's health to become `Degraded` or `Fault`, depending on the RAID level.
- The disk's fault LED is illuminated amber.

If spares are available, and the health of the vdisk is `Degraded`, the vdisk will use them 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 vdisk 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.

Syntax `clear disk-metadata` *`disks`*

Parameters *`disks`*
IDs of the leftover disks to clear metadata from. For disk syntax, see Command syntax on page 20.

Example Show disk usage:

```
# show disks
Location ... How Used ...
-----------------------...
1.1      ... LEFTOVR  ...
1.2      ... VDISK    ...
...
```

Clear metadata from a leftover disk:

```
# clear disk-metadata 1.1
Info: Updating disk list...
Info: Disk disk_1.1 metadata was cleared. (2012-01-18 10:35:39)

Success: Command completed successfully. - Metadata was cleared. (2012-01-18
10:35:39)
```

Try to clear metadata from a disk that is not leftover:

```
# clear disk-metadata 1.2
Error: The specified disk is not a leftover disk. (1.2) - Metadata was not
cleared for one or more disks. (2012-01-18 10:32:59)
```

clear events

Description **For use by or with direction from a service technician.**

Clears the event log for controller A, B, or both.

Syntax `clear events [a|b|both]`

Parameters `a|b|both`
Optional. The controller event log to clear. If this parameter is omitted, both event logs are cleared.

Example Clear the event log for controller A:

```
# clear events a
Success: Command completed successfully. - The event log was successfully
cleared. (2012-01-18 10:40:13)
```

See also

- show events

clear expander-status

Description **For use by or with direction from a service technician.**

Clears the counters and status for SAS expander lanes. 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.

Syntax `clear expander-status [enclosure ID]`

Parameters `enclosure ID`
Optional. The enclosure number.

Example Clear the expander status for the first enclosure:

```
# clear expander-status enclosure 0
Success: Command completed successfully. - Expander status was cleared.
(2012-01-18 14:18:53)
```

See also

- show expander-status

convert master-to-std

Description Converts a specified master volume into a standard volume; that is, it disables the volume from accepting snapshots. If the specified volume has associated snapshots, you must delete the snapshots before converting the volume.

Syntax

```
convert master-to-std master-volume
```

Parameters

master-volume
Name or serial number of the master volume to convert. For volume syntax, see Command syntax on page 20.

Example Convert a master volume having no snapshots to a standard volume:

```
# convert master-to-std MV1
Success: Command completed successfully. (MV1) - The conversion of a master
volume to a standard volume completed. (2012-01-18 12:35:54)
```

See also

- delete all-snapshots
- show master-volumes

convert std-to-master

Description Converts a standard volume to a master volume; that is, it enables the volume for snapshots and associates it with an existing snap pool. The standard volume and the snap pool must be owned by the same controller, though they can be in different vdisks.

Syntax

```
convert std-to-master
   snap-pool snap-pool
   standard-volume
```

Parameters

`snap-pool` *`snap-pool`*
Name or serial number of the snap pool to associate with the new master volume. For volume syntax, see Command syntax on page 20.

`standard-volume`
Name or serial number of the standard volume to convert. For volume syntax, see Command syntax on page 20.

Example Convert standard volume `V1` to a master volume and associate it with snap pool `SP1`:

```
# convert std-to-master snap-pool SP1 V1
Success: Command completed successfully. (V1) - The conversion of a standard
volume to a master volume completed. (2012-01-18 12:35:17)
```

See also

- show volumes

create certificate

Description Creates or removes a custom security certificate.

The storage system supports use of unique certificates for secure data communications, to authenticate that the expected storage systems are being managed. Use of authentication certificates applies to the HTTPS protocol, which is used by the web server in each controller module.

After using this command you must restart the system's Management Controllers to have the change take effect.

Syntax

```
create certificate
    [unique]
    [contents content-string]
    [restore]
    [noprompt]
```

One of the first three optional parameters must be supplied.

Parameters

`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.

`contents` *`content-string`*
Optional. A security certificate is generated based on the supplied content. The content becomes the subject of the certificate creation request and must be formatted as `/type0=value0/type1=value1/type2=...`, where types include `CO` for country, `ST` for state or province, `L` for location, `CN` for common name, and `O` for organization. The content string cannot exceed 100 characters and can include printable UTF-8 characters except space or semicolon. An example is `/CO=US/ST=CO/O=MyOrganization/CN=www.mysite.com`. This certificate is installed, and the original certificate is archived.

`restore`
Optional. The archived original certificate is restored and the custom certificate is discarded. The custom certificate may have been created with this CLI command or uploaded using FTP.

`noprompt`
Optional in console format; required for XML API format. Suppresses the prompt to revert the transaction if the command fails, which requires a yes or no response. If this parameter is specified and the command fails, the transaction is automatically reverted.

Example Create a custom certificate based on the system's serial number:

```
# create certificate unique
To make the certificate change take effect you must restart both Management
Controllers by entering "restart mc both". Press Enter to acknowledge this
message.
Success: Command completed successfully. - Security certificate generated.
(2012-10-04 09:31:40)
```

Create a custom certificate using a content string:

```
# create certificate contents /CO=US/ST=CO/L=NewYork/O=MyCompany/CN=
www.mycompany.com
To make the certificate change take effect you must restart both Management
Controllers by entering "restart mc both". Press Enter to acknowledge this
message.
Success: Command completed successfully. - Security certificate generated.
(2012-10-04 09:31:49)
```

Restore the original certificate that existed before the custom one was generated:

```
# create certificate restore
To make the certificate change take effect you must restart both Management
Controllers by entering "restart mc both". Press Enter to acknowledge this
message.
Success: Command completed successfully. - Security certificate restored.
(2012-10-04 09:31:58)
```

See also

- restart mc both
- show certificate

create chap-record

Description For iSCSI, creates a CHAP record to authenticate 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.

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 iSCSI host to a storage system, the host is the originator and the storage system is the recipient.

Using this command for a CHAP record name that already exists will modify the existing record. Please view the existing CHAP records with the `show chap-records` command.

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 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.

`mutual-name recipient-name`
Optional; for mutual CHAP only. The recipient name, typically in IQN format. The name 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 an iSCSI port Target ID value. 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. A storage system's secret is shared by both controllers. This parameter and `mutual-name` must be set together.

Example 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
Success: Command completed successfully.
(iqn.1991-05.com.microsoft:myhost.domain)- A CHAP record was created.
(2012-01-18 12:39:07)
```

See also

- delete chap-records
- set chap-record
- show chap-records
- show host-parameters
- show iscsi-parameters

create host

Description Creates a host entry with an associated nickname. Use this to create an entry for a host that is not automatically discovered. When mapping volumes to hosts the nickname can make a host easy to recognize.

Syntax

```
create host
   id ID
   nickname
```

Parameters

`id ID`
For FC and SAS, the host node's 16-hex-digit WWPN. The value can include a colon between each byte but the colons will be discarded. For iSCSI, the initiator's IQN. A host ID cannot have more than one entry in the system.

nickname
A nickname for the host node. The name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 15 bytes. A name that includes a space must be enclosed in double quotes.

Example Create an entry named `Host1` for an FC host whose WWPN is 207000C0FF001122:

```
# create host id 207000C0FF001122 Host1
Success: Command completed successfully. - The new host was created.(2012-01-18
15:53:10)
```

Create an entry for an FC host by pasting a WWPN that includes colons:

```
# create host id 20:70:00:c0:ff:d7:4c:07 Host2
Success: Command completed successfully. - The new host was created.(2012-01-18
15:53:20)
```

See also

- set host-name
- show hosts

create master-volume

Description Creates a volume that is enabled for snapshots. The master volume is created in a specified vdisk and is associated with a specified snap pool. You can either associate the master volume with an existing snap pool owned by the same controller, or optionally specify the size of a new snap pool to automatically create. The vdisk and snap pool must be owned by the same controller.

For use with remote replication, you can create a replication-prepared volume that is intended to be added to a replication set as its secondary volume. A secondary volume cannot be assigned a LUN or mapped to hosts.

Syntax

```
create master-volume
    vdisk vdisk
    size size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]
    [snap-pool snap-pool]
    [reserve size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]]
    [lun LUN]
    [prepare-replication-volume]
    name
```

Parameters

`vdisk` *vdisk*
Name or serial number of the vdisk to create the volume in. For vdisk syntax, see Command syntax on page 20.

`size` *size*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
Sets the volume size using the current base, as shown by the show cli-parameters command. The unit can be specified as follows:

- If base 2 is in use: `B` (bytes), `KiB` (kibibytes), `MiB` (mebibytes), or `GiB` (gibibytes).
- If base 10 is in use: `B` (bytes), `KB` (kilobytes), `MB` (megabytes), or `GB` (gigabytes).

If no unit is specified, the unit is 512-byte blocks.

`snap-pool` *snap-pool*
Optional. Name or serial number of the snap pool to associate with the new master volume. For volume syntax, see Command syntax on page 20. If this parameter is omitted, the system automatically creates a snap pool that is either 20% of the master volume's size or 5.37 GB, whichever is larger. Use either this parameter or the `reserve` parameter.

`reserve` *size*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
Optional. Size of the snap pool to create in the vdisk. The default size is either 20% of the volume size or 5.37 GB, whichever is larger. Use either this parameter or the `snap-pool` parameter.

NOTE: In rare cases, a large amount of I/O can cause a snap pool that is too small to fill quickly. This can result in all snapshots being deleted due to the snap pool running out of space. Create snap pools of at least 50 GB to avoid this situation.

`lun` *LUN*
Optional. A default LUN to assign to the new master volume. If this parameter is omitted, no LUN is assigned. Use either this parameter or the `prepare-replication-volume` parameter.

`prepare-replication-volume`
Optional. Specifies to create a replication volume instead of a regular master volume. Use either this parameter or the `lun` parameter.

name
A name for the new volume. The name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 20 bytes. A name that includes a space must be enclosed in double quotes.

Example Create the 20-GB master volume `MV1` on vdisk `VD1`, and associate it with snap pool `SP1`:

```
# create master-volume vdisk VD1 size 20GB snap-pool SP1 lun 3 MV1
Info: The volume was created. (MV1)
Info: The volume was mapped. (MV1) (2012-01-18 12:30:22)
Success: Command completed successfully. (2012-01-18 12:30:22)
```

Create the 50-GB replication volume `MV2` on vdisk `VD1`, and automatically create an associated 20-GB snap pool:

```
# create master-volume vdisk VD1 size 50GB prepare-replication-volume reserve
20GB MV2
Info: The volume was created. (spMV2)
Info: The volume was created. (MV2)
Success: Command completed successfully. (2012-01-18 12:32:04)
```

See also

- show master-volumes
- show snap-pools
- show vdisks

create remote-system

Description Creates a persistent association with a remote storage system. This allows a local system to track remote systems by their network-port IP addresses and cache their login credentials. The IP address you specify is used to connect to the remote system and obtain information such as the system name and both controllers' IP addresses. You can then use the system name or an IP address in commands that need to interact with the remote system.

Syntax

```
create remote-system
   username username
   password password
   system
```

Parameters

`username` *username*
Name of a user on the remote system. This must be a manage-level user to remotely configure or provision that system.

`password` *password*
Password for that user.

system
Network-port IP address of the remote system.

Example Create a remote system:

```
# create remote-system username manage password !manage 10.122.1.21
Success: Command completed successfully. (10.122.1.21) - The remote system was
created. (2012-01-18 12:10:26)
```

See also

- delete remote-system
- remote
- set remote-system
- show remote-systems

create replication-set

Description Creates a replication set from a specified standard or master volume. If you specify a standard volume, it is converted to a master volume using default policies for snap-pool creation. You can optionally use the `reserve` parameter to set the snap-pool size. The specified volume becomes the replication set's primary volume.

You can specify a remote volume to be the replication set's secondary volume, or one will be created. When a replicate snapshot or replicate volume command is issued, data in the primary volume is replicated to the associated secondary volume.

You can associate the primary volume with a remote system in two ways:

- If the local and remote MCs can communicate, you can specify a vdisk on a remote system. A master volume and snap-pool are created in the remote vdisk.
- If the local and remote MCs cannot communicate or you want to use an existing replication-prepared volume on the remote system, you can specify the volume to use as the secondary volume.

You can also start the initial replication by specifying the `snapshot` parameter.

If you create a replication set without specifying a replication destination, a partial set is created and you must use the add replication-volume command to complete the set before you can perform replication.

IMPORTANT: Before starting this procedure, if you intend to use CHAP to authenticate iSCSI login requests between the local system and a remote system, do the following:

- Create a one-way CHAP record on each system. On the local system, the CHAP record must refer to the node name of the remote system. On the remote system, the CHAP record must refer to the node name of the local system. Both records must use the same secret. (Mutual CHAP is not used between storage systems. CHAP records' mutual fields can be set but are not used.) To create a CHAP record, use the create chap-record command.
- After the CHAP records are created, enable CHAP on the primary system, the secondary system, or both. To enable CHAP, use the set iscsi-parameters command.

If both records don't exist or don't use the same secret, replication-set creation will fail.

If the create transaction fails, a prompt asks if you want to revert the transaction, which undoes any changes made in attempting to create the replication set. To revert, enter `yes`; otherwise, enter `no`.

Syntax

```
create replication-set
    [link-type FC|iSCSI]
    [max-queue #]
    [noprompt]
    [nowait]
    [primary-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs]
    [priority low|medium|high]
    [remote-system system]
    [remote-vdisk vdisk]
    [remote-volume volume]
    [reserve size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]]
    [secondary-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs]
    [set name]
    [snapshot snapshot]
    primary-volume
```

Parameters `link-type FC|iSCSI`
Optional; required if the `primary-address` parameter is *not* specified. Specifies the type of ports being used for the inter-system link:

- `FC`: FC ports.
- `iSCSI`: iSCSI ports.

`max-queue #`
Optional. Number of replication images to consider when determining the next image to replicate: 1–64. Used only if the `on-collision` parameter is set to `oldest`.

`noprompt`
Optional in console format; required for XML API format. Suppresses the prompt to revert the transaction if the command fails, which requires a yes or no response. If this parameter is specified and the command fails, the transaction is automatically reverted.

`nowait`
Optional. Adding a volume to a replication set can take the Storage Controller several minutes to complete. This parameter allows that processing to continue in the background so the Management Controller can process other commands.

`primary-address ip=`*`address`*`|iqn=`*`IQN`*`|wwn=`*`WWN`*
Optional. Specifies host ports on 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.

`priority low|medium|high`
Optional. Priority of the replication process on the replication volumes: low, medium, or high.

`remote-system` *`system`*
Optional; required if the `remote-vdisk` or `remote-volume` parameter specifies a destination in a remote system. Name or network-port IP address of the remote system.

`remote-vdisk` *`vdisk`*
Optional. Name or serial number of the vdisk that the remote volume and snap pool should be created in. If the vdisk is on a remote system:

- You must specify the `remote-system` parameter.
- If the local and remote MCs can communicate, you can specify a name or serial number; otherwise, you must specify a serial number.

The snap pool created on the secondary system will be the same size as the snap pool on the primary system.

`remote-volume` *`volume`*
Optional; do not use with the `remote-vdisk` parameter. Name or serial number of a replication-prepared volume to use as a secondary volume. If the volume is on a remote system and the local and remote MCs can communicate, you can specify a name or serial number; otherwise, you must specify a serial number.

`reserve size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
Optional. Specifies the size of the snap pool to create if the primary volume is a standard volume. The size value uses the current base, as shown by the `show cli-parameters` command. The unit can be specified as follows.

- If base 2 is in use: B (bytes), KiB (kibibytes), MiB (mebibytes), or GiB (gibibytes).
- If base 10 is in use: B (bytes), KB (kilobytes), MB (megabytes), or GB (gigabytes).

If no unit is specified, the unit 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.

NOTE: In rare cases, a large amount of I/O can cause a snap pool that is too small to fill quickly. This can result in all snapshots being deleted due to the snap pool running out of space. Create snap pools of at least 50 GB to avoid this situation.

`secondary-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs`
Optional if the MCs can communicate and the `remote-system` parameter is specified; required if the MC cannot communicate and a replication-prepared volume is specified. Specifies host ports on the remote 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.

`set name`
Optional. Name for the new replication set. The name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 20 bytes. A name that includes a space must be enclosed in double quotes. If this parameter is omitted, the set is named `rsprimary-volume`.

`snapshot snapshot`
Optional. Name for the replication snapshot that will be created during the replication process. A name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 20 bytes. A name that includes a space must be enclosed in double quotes. Specifying this parameter will start the initial replication.

`primary-volume`
Name or serial number of a standard or master volume to use as the primary volume.

Example For two systems connected with FC links, set up replication from local standard volume `Data` to remote vdisk VD1 in remote system `System2`:

```
# create replication-set link-type FC remote-system System2 remote-vdisk VD1
Data
Info: The secondary volume was created. (rData)
Info: The primary volume was prepared for replication. (Data)
Info: Started adding the secondary volume to the replication set. (rData)
Info: Verifying that the secondary volume was added to the replication set.
This may take a couple of minutes... (rData)
Info: The secondary volume was added to the replication set. (rData)
Info: The primary volume is ready for replication. (Data)
Success: Command completed successfully. (2011-10-12 10:46:09)
```

For two systems connected with FC links, set up replication from local master volume `Source` to remote replication-prepared volume `Dest`:

```
# create replication-set link-type FC remote-system System2 remote-volume Dest
Source
```

For two systems whose MCs aren't currently connected, set up replication from local master volume `MV` to a remote replication-prepared volume:

```
# create replication-set primary-address wwpn=207000c0ffd52c31,217000c0ffd52c31
remote-volume 00c0ffda421f000089b16b4d01000000 secondary-address
wwpn=207000c0ffd52c31,217000c0ffd52 MV
```

For two systems whose MCs aren't currently connected but will use iSCSI links, set up replication from local master volume `MV` to a remote replication-prepared volume:

```
# create replication-set link-type iSCSI primary-address ip=10.134.9.1
remote-volume 00c0ffda421f000089b16b4d01000000 secondary-address
ip=10.134.11.10,10.134.11.11 MV
```

Create a local replication set using existing master volume `Personnel` as the primary volume and a new volume in vdisk `vd1` for the secondary volume:

```
# create replication-set link-type FC remote-vdisk vd1 Personnel
```

Create a local replication set using existing master volume `Test` as the primary volume and existing replication-prepared volume `Test-backup` as the secondary volume:

```
# create replication-set link-type FC remote-volume Test-backup Test
```

See also

- add replication-volume
- delete replication-set
- remove replication-volume
- replicate snapshot
- show remote-systems
- show replication-images
- show replication-sets
- show replication-volumes

create schedule

Description Schedules a task to run automatically.

When scheduling `ReplicateVolume` tasks, a best practice is to schedule no more than three volumes to start replicating at the same time, and for those replications to recur no less than 60 minutes apart. If you schedule more replications to start at the same time, or schedule replications to start more frequently, some scheduled replications may not have time to complete.

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 `ReplicateVolume` task, the default and 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 weekday|weekendday|Sunday|Monday|Tuesday|Wednesday|Thursday|Friday |Saturday of year|month|January|February|March|April|May|June|July |August|September|October |November|December]`
  Constrains the days or months when the task is permitted to run. Ensure that this constraint includes the start date.
- `[count #]`
  Constrains the number of times the task is permitted to run.
- `[expires` *`yyyy-mm-dd hh:mm`* `[AM|PM]]`
  Specifies when the schedule expires, after which the task will no longer run.

`task-name` *`task-name`*
The task to run. The name is case sensitive.

`schedule-name`
A name for the new schedule. The name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 32 bytes. A name that includes a space must be enclosed in double quotes.

Example Create schedule `Sched1` that runs `Task1` for the first time on March 1, 2012; runs daily between midnight and 1:00 AM; and runs for the last time in the morning of January 1, 2013:

```
# create schedule schedule-specification "start 2012-03-01 00:01, every 1 days,
between 12:00 AM and 1:00 AM, expires 2013-01-01 1:00 AM" task-name Task1 Sched1
Success: Command completed successfully. (Sched1) - The schedule was created.
(2012-01-20 15:48:01)
```

Create schedule `Sched2` that runs `Task2` for the first time on March 1, 2012, and on the first weekday of each month, with no expiration:

```
# create schedule schedule-specification "start 2012-03-01 00:01 only first
weekday of month" task-name Task2 Sched2
Success: Command completed successfully. (Sched2) - The schedule was created.
(2012-01-20 15:46:16)
```

Try to create Sched3 with a start time outside the "between" range:

```
# create schedule schedule-specification "start 2012-01-14 4:15 PM between 12:00
AM and 12:00 PM" task-name Task3 Sched3
Error: create schedule: (Sched3) - The specified start time must be within the
range specified with the 'between' parameter. (2012-01-20 15:46:08)
```

See also

- show schedule-details
- show schedules
- show task-details
- show tasks

create snap-pool

Description Creates a snap pool to use for snapshot data. A snap pool is an internal volume and cannot be mapped.

Syntax

```
create snap-pool
    vdisk vdisk
    size size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]
    name
```

Parameters

`vdisk` *`vdisk`*
Name or serial number of the vdisk to create the snap pool in. For vdisk syntax, see Command syntax on page 20.

`size` *`size`*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
Sets the snap-pool size using the current base, as shown by the show cli-parameters command. The unit can be specified as follows:

- If base 2 is in use: `B` (bytes), `KiB` (kibibytes), `MiB` (mebibytes), or `GiB` (gibibytes).
- If base 10 is in use: `B` (bytes), `KB` (kilobytes), `MB` (megabytes), or `GB` (gigabytes).

If no unit is specified, the unit is 512-byte blocks. The supported minimum size is 5 GiB or 5.37 GB.

NOTE: In rare cases, a large amount of I/O can cause a snap pool that is too small to fill quickly. This can result in all snapshots being deleted due to the snap pool running out of space. If you expect the snap pool to have a high rate of data change, use the show snap-pools command to view the snap pool's size. If it is less than 50 GB, use the expand snap-pool command to expand its size to at least 50 GB.

`name`
A name for the new snap pool. The name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 20 bytes. A name that includes a space must be enclosed in double quotes.

Example Create the 50 GB snap pool `SP1` on vdisk `VD1`:

```
# create snap-pool vdisk VD1 size 50GB SP1
Info: The volume was created. (SP1)
Success: Command completed successfully. (2012-01-18 12:29:59)
```

See also

- show snap-pools
- show vdisks

create snapshots

Description Creates a snapshot of each specified source volume. The source volume can be a standard volume or a master volume. The first time a snapshot is created of a standard volume, the volume is converted to a master volume and a snap pool is created. The snap pool's size is either 20% of the volume size or 5.37 GB, whichever is larger. Before creating or scheduling snapshots, verify that the vdisk has enough free space to contain the snap pool.

NOTE: In rare cases, a large amount of I/O can cause a snap pool that is too small to fill quickly. This can result in all snapshots being deleted due to the snap pool running out of space. Create snap pools of at least 50 GB to avoid this situation.

Syntax

```
create snapshots
    volumes volumes
    [master-volumes master-volumes]
    snap-names
```

Parameters

volumes *volumes*
A comma-separated list of up to 16 standard or master volumes to take snapshots of. A standard volume is converted to a master volume before a snapshot is taken. For volume syntax, see Command syntax on page 20.

`master-volumes` *master-volumes*
Deprecated; use the `volumes` parameter.

snap-names
A comma-separated list of names for the resulting snapshots. A name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 20 bytes. A name that includes a space must be enclosed in double quotes.

Example Create snapshots of standard volume `V1` and master volume `V2`:

```
# create snapshots volumes V1,V2 V1snap,V2snap
Info: The volume was created. (spV1)
Success: Command completed successfully. (V1snap,V2snap) - Snapshot(s) were
created. (2012-01-19 14:23:00)
```

See also

- show snapshots
- show volumes

create task

Description Creates a task that can be scheduled. You can create a task to take a snapshot of a standard or master volume; to copy a standard, master, or snapshot volume to a new standard volume; to replicate a replication set's primary volume to a remote system; to reset a snapshot; or to enable or disable drive spin down.

The first time a snapshot or volume copy is created of a standard volume, the volume is converted to a master volume and a snap pool is created in the volume's vdisk. The snap pool's size is either 20% of the volume size or 5.37 GB, whichever is larger. Before creating or scheduling snapshots or copies, verify that the vdisk has enough free space to contain the snap pool.

△ **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.

Syntax To create a task to take a snapshot:

```
create task
    type TakeSnapshot
    source-volume volume
    snapshot-prefix prefix
    retention-count #
    name
```

To create a task to reset a snapshot:

```
create task
    type ResetSnapshot
    snapshot-volume volume
    name
```

To create a task to copy a volume:

```
create task
    type VolumeCopy
    source-volume volume
    dest-vdisk vdisk
    dest-prefix prefix
    [modified-snapshot yes|no]
    name
```

To create a task to replicate a volume:

```
create task
    type ReplicateVolume
    source-volume volume
    snapshot-prefix prefix
    retention-count #
    [replication-mode new-snapshot|last-snapshot]
    name
```

To create a task to enable spin down for all disks:

```
create task type EnableDSD taskDSDresume
```

To create a task to disable spin down for all disks:

```
create task type DisableDSD taskDSDsuspend
```

Parameters `type TakeSnapshot|ResetSnapshot|VolumeCopy|ReplicateVolume|EnableDSD|DisableDSD`
The task type:

- `TakeSnapshot`: Takes a snapshot of a standard or master volume.
- `ResetSnapshot`: Deletes the data in the snapshot and resets it to the current data in the associated master volume. The snapshot's name and other volume characteristics are not changed.
- `VolumeCopy`: Copies a standard, master, or snapshot volume to a new standard volume. The command creates the destination volume you specify, which must be in a vdisk owned by the same controller as the source volume.
- `ReplicateVolume`: Replicates a replication set's primary volume to a remote system.
- `EnableDSD`: Enables spin down for all vdisks. You can use this to enable or resume spin down during hours of infrequent activity.
- `DisableDSD`: Disables spin down for all vdisks. You can use this to disable or suspend spin down during hours of frequent activity.

`source-volume` *`volume`*
For a `TakeSnapshot` task, the name or serial number of the standard or master volume to take a snapshot of. For a `VolumeCopy` task, the name or serial number of the standard, master, or snapshot volume to copy. For a `ReplicateVolume` task, the name or serial number of the primary volume to replicate. For volume syntax, see Command syntax on page 20.

`snapshot-prefix` *`prefix`*
A label to identify snapshots created by this task. Snapshot names have the format *`prefix`*`_s#`, where `#` starts at `001`.

`retention-count #`
For a `TakeSnapshot` task this parameter specifies the number of snapshots created by this task to retain, from 1 to the licensed limit. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted.

For a `ReplicateVolume` task this parameter specifies the number of replication images created by this task to retain, from 2 to 32. When a new image exceeds this limit, the oldest image with the same prefix is deleted. This parameter applies to the primary volume only; for the secondary volume, images will accumulate until either the secondary vdisk's space limit is reached or the maximum number of images is reached, after which the oldest image will be deleted as new images are created.

`snapshot-volume` *`volume`*
Name or serial number of the snapshot to reset. For volume syntax, see Command syntax on page 20.

`dest-vdisk` *`vdisk`*
Name or serial number of the destination vdisk for the volume copy. For vdisk syntax, see Command syntax on page 20.

`dest-prefix` *`prefix`*
A label to identify the volume copy created by this task. Copy names have the format *`prefix`*`_c#`, where `#` starts at `001`.

`modified-snapshot yes|no`
Optional. Specifies whether to include or exclude modified write data from the snapshot in the copy. This parameter applies only when the source volume is a snapshot; it is ignored if the source volume is a master volume.

- `yes`: Include modified snapshot data.
- `no`: Exclude modified snapshot data.

If this parameter is omitted for a snapshot, modified snapshot data is excluded.

`replication-mode new-snapshot|last-snapshot`
Optional. Specifies whether to replicate a new snapshot of the volume to the remote system, or to replicate the last (most recent existing) snapshot of the volume to the remote system.

- `new-snapshot`: Replicate a new snapshot.
- `last-snapshot`: Replicate the most recent existing snapshot.

If this parameter is omitted, a new snapshot is replicated.

name
A name for the new task. The name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 32 bytes. A name that includes a space must be enclosed in double quotes.

Example Create task `Snap` that takes a snapshot of master volume `VD1_V1` and retains only the latest four snapshots with the prefix `VD1_V1` (e.g., `VD1_V1_S0001`):

```
# create task type TakeSnapshot source-volume VD1_V1 snapshot-prefix VD1_V1
retention-count 4 Snap
Success: Command completed successfully. (Snap) - The task was created.
(2012-01-19 15:45:10)
```

Create task `Reset` that resets snapshot `VD1_V1_S0001`:

```
# create task type ResetSnapshot snapshot-volume VD1_V1_S0001 Reset
Success: Command completed successfully. (Reset) - The task was created.
(2012-01-19 15:46:21)
```

Create task `Copy` that copies volume `VD1_V1` to vdisk `VD2` with name `C_V0001`:

```
# create task type VolumeCopy source-volume VD1_V1 dest-vdisk VD2 dest-prefix C
modified-snapshot yes Copy
Success: Command completed successfully. (Copy) - The task was created.
(2012-01-19 15:46:33)
```

Create task `Replicate` that replicates primary volume `VD1_V2`:

```
# create task type ReplicateVolume source-volume VD1_V2 snapshot-prefix VD1_V2
retention-count 4 Replicate
Success: Command completed successfully. (Replicate) - The task was created.
(2012-01-19 15:46:58)
```

Create a task to enable or resume spin down for all disks:

```
# create task type EnableDSD taskDSDresume
Success: Command completed successfully. (taskDSDresume) - The task was created.
(2012-01-19 15:47:04)
```

Create a task to disable or suspend spin down for all disks:

```
# create task type DisableDSD taskDSDsuspend
Success: Command completed successfully. (taskDSDsuspend) - The task was
created. (2012-01-19 15:47:15)
```

See also

- create schedule
- set task
- show task-details
- show tasks
- show volumes

create user

Description Creates a user account. The system supports 12 user accounts. You can create a general user that can access the WBI, CLI, 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.

Syntax

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

Parameters

`authentication-type MD5|SHA|none`
Optional. For an SNMPv3 user, this specifies whether to use a security authentication protocol. Authentication uses the user password.

- `MD5`: MD5 authentication. This is the default.
- `SHA`: SHA (Secure Hash Algorithm) 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.
- `10`: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. This 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. The defaults are `cli` and `wbi`. A command that specifies `snmpuser` or `snmptarget` cannot also specify a non-SNMP interface.

- `cli`: Command-line interface.
- `wbi`: Web-browser interface (RAIDar).
- `ftp`: File transfer protocol 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.

`level monitor|manage`
Optional.

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

`locale English|en|Spanish|es|French|fr|German|de|Italian|it|Japanese|ja|Korean|ko|Dutch|nl|Chinese-simplified|zh-s|Chinese-traditional|zh-t`
Optional. The display language. The default is English.

`password` *`password`*
Optional in console format; required for XML API format. Sets a new password for the user. 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. For user password rules, type `help syntax`.

`precision #`
Optional. Sets the number of decimal places (1–10) for display of storage-space sizes. 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. For user password rules, type `help syntax`.

`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.

`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` *`IP-address`*
Optional. For an SNMPv3 user whose `interface` parameter is set to `snmptarget`, this specifies the IP address of the host that will receive SNMP traps.

`type novice|standard|advanced|diagnostic`
Optional. Identifies the user's experience level. 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. The name is case sensitive; cannot include a comma, double quote, backslash, or space; and can have a maximum of 29 bytes.

NOTE: The user name `admin` is reserved for internal use.

Example Create user `John` who will view system information using base 2 in RAIDar:

```
# create user base 2 interfaces wbi level monitor John
Enter new password: ********
Re-enter new password: ********
Success: Command completed successfully. (John) - The new user was created.
(2012-01-20 15:54:35)
```

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 Abcd5678 MIB
Success: Command completed successfully. (MIB) - The new user was created.
(2012-01-20 15:54:45)
```

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

```
# create user interfaces snmptarget authentication-type MD5 trap-host
172.22.4.171 Traps
Enter new password: *********
Re-enter new password: *********
Success: Command completed successfully. (Traps) - The new user was created.
(2012-01-20 15:54:55)
```

See also

- set snmp-parameters
- set user
- show users

create vdisk

Description Creates a vdisk using the specified RAID level, disks, and spares. All disks used in a vdisk and its spares must be either SAS or SATA; mixing disk types is not supported.

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 vdisks, see the RAIDar User Guide.

Syntax

```
create vdisk
   level nraid|raid0|r0|raid1|r1|raid3|r3|raid5|r5|raid6|r6|raid10|r10
   |raid50|r50
   disks disks
   [assigned-to a|b|auto]
   [spare disks]
   [chunk-size 16k|32k|64k|128k|256k|512k]
   [mode online|offline]
   name
```

Parameters

`level nraid|raid0|r0|raid1|r1|raid3|r3|raid5|r5|raid6|r6|raid10|r10|raid50|r50`
Specifies the RAID level.

`disks` *disks*
IDs of the disks to include in the vdisk. RAID 10 requires a minimum of two RAID-1 sub-vdisks each having two disks. RAID 50 requires a minimum of two RAID-5 sub-vdisks each having three disks. For disk syntax, see Command syntax on page 20.

`assigned-to a|b|auto`
Optional. For a system operating in Active-Active ULP mode, this specifies the controller to own the vdisk. 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.

`spare` *disks*
Optional. IDs of 1–4 dedicated spares to assign to a RAID 1, 3, 5, 6, 10, or 50 vdisk. For disk syntax, see Command syntax on page 20.

`chunk-size 16k|32k|64k|128k|256k|512k`
Optional. The amount of contiguous data, in KB, that is written to a vdisk member before moving to the next member of the vdisk. For RAID 50, this option sets the chunk size of each RAID-5 subvdisk. The chunk size of the RAID-50 vdisk is calculated as: *configured-chunk-size* x (*subvdisk-members* - 1). For NRAID and RAID 1, `chunk-size` has no meaning and is therefore not applicable. The default size is `64k`.

`mode online|offline`
Optional. Specifies whether the vdisk is initialized online or offline.

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

name
A name for the new vdisk. The name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 20 bytes. A name that includes a space must be enclosed in double quotes.

Example Create the RAID-1 vdisk `VD1` using two disks in the first enclosure:

```
# create vdisk level raid1 disks 0.1,0.3 VD1
Success: Command completed successfully. (2012-01-20 09:57:49)
```

Create the RAID-50 vdisk `VD2` having three RAID-5 sub-vdisks, each having three disks:

```
# create vdisk level r50 disks 0.1-3:0.4-6:0.7-9 VD2
Success: Command completed successfully. (2011-10-03 11:12:54)
```

Create the RAID-6 vdisk `vdR6` using four disks:

```
# create vdisk level r6 disks 2.3-4,2.8-9 vdR6
Success: Command completed successfully. (2012-01-20 12:58:43)
```

See also

- set vdisk
- show disks
- show vdisks

create volume

Description Creates a volume in a vdisk. 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.

Syntax

```
create volume
    vdisk vdisk
    size size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]
    [mapping ports.LUN]
    [access read-write|rw|read-only|ro|no-access]
    [lun LUN]
    [ports ports]
    [snap-pool snap-pool]
    [reserve size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]]
    [snappable]
    [prepare-replication-volume]
    name
```

Parameters

`vdisk` *vdisk*
Name or serial number of the vdisk to create the volume in. For vdisk syntax, see Command syntax on page 20.

`size` *size*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
Sets the volume size using the current base, as shown by the show cli-parameters command. The unit can be specified as follows:

- If base 2 is in use: `B` (bytes), `KiB` (kibibytes), `MiB` (mebibytes), or `GiB` (gibibytes).
- If base 10 is in use: `B` (bytes), `KB` (kilobytes), `MB` (megabytes), or `GB` (gigabytes).

If no unit is specified, the unit is 512-byte blocks.

`mapping` *ports.LUN*
Deprecated; use the `ports` and `lun` parameters.

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

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

`ports` *ports*
Optional. The ports through which the host can access the volume. In a hybrid system, select either FC or iSCSI ports, not both. For port syntax, see Command syntax on page 20. If this parameter is omitted, all ports are selected.

`snap-pool` *snap-pool*
Optional. Name or serial number of the snap pool to associate with the new volume. For volume syntax, see Command syntax on page 20.

`reserve size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
Optional. Size of the snap pool to create in the vdisk. If this parameter is omitted, the size will be either 20% of the volume size or 5.37 GB, whichever is larger. Use either this parameter or the `snap-pool` parameter.

NOTE: In rare cases, a large amount of I/O can cause a snap pool that is too small to fill quickly. This can result in all snapshots being deleted due to the snap pool running out of space. Create snap pools of at least 50 GB to avoid this situation.

`snappable`
Optional. Specifies to create a master volume instead of a standard volume.

`prepare-replication-volume`
Optional. Specifies to create a secondary volume instead of a regular master volume. This parameter precludes use of the `mapping`, `lun`, and `ports` parameters because a secondary volume cannot be mapped.

`name`
A name for the new volume. The name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 20 bytes. A name that includes a space must be enclosed in double quotes.

Example Create the 20-GB volume `V1` on vdisk `VD1`, and map it to ports A1 and B1 using LUN 5:

```
# create volume vdisk VD1 size 20GB ports a1,b1 lun 5 V1
Info: The volume was created. (V1)
Info: The volume was mapped. (V1) (2012-01-18 16:53:27)
Success: Command completed successfully. (2012-01-18 16:53:27)
```

See also

- set volume
- show vdisks
- show volumes

create volume-set

Description Creates a specified number of volumes in a vdisk. 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.

Syntax

```
create volume-set
   vdisk vdisk
   basename base-name
   count #
   size size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]
   [baselun base-LUN]
   [access read-write|rw|read-only|ro|no-access]
   [ports ports]
```

Parameters

`vdisk vdisk`
Name or serial number of the vdisk to create the volumes in. For vdisk syntax, see Command syntax on page 20.

`basename base-name`
A name to which a number will be appended to generate a different name for each volume. A name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 16 bytes. A name that includes a space must be enclosed in double quotes.

Resulting volumes are numbered sequentially starting with 000. 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_v000` and `vd1_v002` exist, the next volumes created will be `vd1_v001` and `vd1_v003`.

`count #`
The number of volumes to create, from 1 to 128. Volumes are created up to the maximum number supported per vdisk.

`size size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
Sets the size for each volume using the current base, as shown by the show cli-parameters command. The unit can be specified as follows:

- If base 2 is in use: `B` (bytes), `KiB` (kibibytes), `MiB` (mebibytes), or `GiB` (gibibytes).
- If base 10 is in use: `B` (bytes), `KB` (kilobytes), `MB` (megabytes), or `GB` (gigabytes).

If no unit is specified, the unit is 512-byte blocks. If the combined size of the volumes exceeds the capacity of the vdisk, an error message is displayed and no volumes are created.

`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.

`access read-write|rw|read-only|ro|no-access`
Optional. Access privilege that hosts have to these volumes: read-write (`rw`), read-only (`ro`), or no-access. If `no-access` is specified, the volume is not mapped. The default is `read-write`.

`ports ports`
Optional. The controller ports through which hosts can access the volumes using LUNs specified by the `baselun` parameter. For port syntax, see Command syntax on page 20. If not all ports are specified, the unspecified ports are not mapped. If the `ports` and `baselun` parameters are omitted, the volumes are not mapped.

Example Create two unmapped, 100-GB volumes with base name `data-` in vdisk `data`, and show the results:

```
# create volume-set count 2 size 100GB vdisk data basename data-
Info: The volume was created. (data-000)
Info: The volume was created. (data-001)
Success: Command completed successfully. (2012-01-20 14:24:09)

# show volume-maps
Volume View [Serial Number (SN) Name (data-000) ] Mapping:
   Ports LUN   Access       Host-Port-Identifier Nickname
   -------------------------------------------------------
               not-mapped   all other hosts

Volume View [Serial Number (SN) Name (data-001) ] Mapping:
   Ports LUN   Access       Host-Port-Identifier Nickname
   -------------------------------------------------------
               not-mapped   all other hosts

Success: Command completed successfully. (2012-01-20 14:24:27)
```

Create ten 20-GB volumes with the base name `vd1_v` in vdisk `vd1`, mapped starting with LUN 5 with read-only access through port A1, and show the results:

```
# create volume-set count 10 size 20GB vdisk vd1 basename vd1_v baselun 5
access ro ports a1
Info: The volume was created. (vd1_v000)
...
Info: The volume was created. (vd1_v009)
Info: The volume was mapped. (vd1_v000)
...
Info: The volume was mapped. (vd1_v009)
Success: Command completed successfully. (2012-01-20 14:26:37)

# show volume-maps
Volume View [Serial Number (SN) Name (vd1_v000) ] Mapping:
   Ports LUN   Access       Host-Port-Identifier Nickname
   -------------------------------------------------------
   A1    5     read-only    all other hosts

Volume View [Serial Number (SN) Name (vd1_v001) ] Mapping:
   Ports LUN   Access       Host-Port-Identifier Nickname
   -------------------------------------------------------
   A1    6     read-only    all other hosts

...

Volume View [Serial Number (SN) Name (vd1_v009) ] Mapping:
   Ports LUN   Access       Host-Port-Identifier Nickname
   -------------------------------------------------------
   A1    14    read-only    all other hosts

Success: Command completed successfully. (2012-01-20 14:26:47)
```

See also

- map volume
- set volume
- show vdisks
- show volume-maps
- show volumes
- unmap volume

delete all-master-volumes

Description Deletes all master volumes associated with a specified snap pool. The volumes' schedules and tasks are also deleted.

NOTE: You must delete all snapshots that exist for the master volumes before you can delete the master volumes.

Syntax `delete all-master-volumes snap-pool` *volume*

Parameters `snap-pool` *volume*
Name or serial number of the snap pool whose master volumes should be deleted. For volume syntax, see Command syntax on page 20.

Example Delete all master volumes associated with snap pool `SP1`:

```
# delete all-master-volumes snap-pool SP1
Success: Command completed successfully. (SP1) - All master volumes were
deleted. (2012-01-20 14:56:23)
```

See also
- delete all-snapshots
- show master-volumes
- show snap-pools

delete all-snapshots

Description Deletes all snapshots associated with a specified volume. All data associated with the snapshots is deleted and their space in the snap pool is freed for use. The specified volume can be a master volume or a snap pool. The snapshots' schedules are also deleted.

Syntax

```
delete all-snapshots
   volume volume
   [delete-type all-standard-snapshots|all-replication-snapshots
   |all-snapshot-types]
```

Parameters

`volume volume`
Name or serial number of the master volume or snap pool. For volume syntax, see Command syntax on page 20.

`delete-type all-standard-snapshots|all-replication-snapshots |all-snapshot-types`
Optional; for remote-replication enabled systems only. Type of snapshots that can be deleted. If this parameter is omitted, the default is `all-standard-snapshots`, which means that the command will try to delete only standard snapshots and will not succeed if replication snapshots exist.

Example Delete all snapshots associated with master volume `MV1`:

```
# delete all-snapshots volume MV1
Info: This may take a few minutes if the system is under heavy load...
Success: Command completed successfully. (MV1) - All snapshots were deleted.
(2012-01-20 14:59:01)
```

Delete all replication snapshots associated with master volume `MV2`, which is the primary volume in a replication set:

```
# delete all-snapshots volume MV2 delete-type all-replication-snapshots
Info: This may take a few minutes if the system is under heavy load...
Success: Command completed successfully. (MV2) - All snapshots were deleted.
(2012-01-20 14:59:01)
```

See also

- show snapshots
- show volumes

delete chap-records

Description For iSCSI, deletes a specified CHAP record or all CHAP records. This command is permitted whether or not CHAP is enabled.

Syntax To delete the CHAP record for a specific originator:

```
delete chap-records name originator-name
```

To delete all CHAP records:

```
delete chap-records all
```

Parameters

`name originator-name`
The originator name, typically in IQN format.

`all`
Delete all CHAP records in the database.

Example Delete the CHAP record for a specific originator:

```
# delete chap-records name iqn.1991-05.com.microsoft:myhost.domain
Success: Command completed successfully. (iqn.1991-05.com.microsoft:myhost
.domain) - The CHAP record was deleted. (2012-01-20 12:40:22)
```

Delete all CHAP records, of which two exist:

```
# delete chap-records all
Info: Removed CHAP record 0.
Info: Removed CHAP record 1.
Success: Command completed successfully. - All CHAP records were deleted.
(2012-01-20 12:40:22)
```

See also

- create chap-record
- set chap-record
- show chap-records
- show host-parameters

delete global-spare

Description Deletes specified global spare disks.

Syntax `delete global-spare disks` *`disks`*

Parameters `disks` *`disks`*
IDs of the global spares to delete. For disk syntax, see Command syntax on page 20.

Example Delete two global spares:

```
# delete global-spare disks 1.1,1.5
Info: Global spare disk 1.1 was deleted. (1.1)
Info: Global spare disk 1.5 was deleted. (1.5)
Success: Command completed successfully. (2012-01-20 11:32:56)
```

See also

- delete vdisk-spare
- set spares
- show disks

delete host

Description Deletes a discovered or manually created host. In order to delete a discovered host, it must have a nickname. If the host is not mapped or has only default mappings, you can delete it. If the host has explicit mappings, you must delete the mappings before you can delete the host.

Syntax `delete host host`

Parameters *host*
The ID or nickname of the host.

Example Delete the manually created host named `MyHost`:

```
# delete host MyHost
Success: Command completed successfully. (2012-01-18 17:06:41)
```

Delete the discovered host named `Host1`:

```
# delete host Host1
Success: Command completed successfully. (2011-10-10 17:06:51)
```

Try to delete the mapped host whose ID is `100000062b0e5e15`:

```
# delete host 100000062b0e5e15
Error: The specified host is mapped to one or more volumes so the host was not
deleted. (2012-01-18 17:10:20)
```

See also

- set host-name
- show host-maps
- show hosts

delete master-volume

Description Deletes a master volume. The volume's schedules and tasks are also deleted.

NOTE: You must delete all snapshots that exist for the master volume before you can delete it.

Syntax `delete master-volume volume`

Parameters *volume*
Name or serial number of the master volume to delete. For volume syntax, see Command syntax on page 20.

Example Delete master volume `MV1`:

```
# delete master-volume MV1
Success: Command completed successfully. (MV1) - The master volume was deleted.
(2012-01-21 12:13:00)
```

See also
- delete all-snapshots
- show master-volumes

delete remote-system

Description Deletes the persistent association with a remote system.

After establishing replication to a remote system, if you choose to delete the remote system you can safely do so without affecting replications. However, because the remote system's name and IP address will no longer appear in user interfaces, record this information before deleting the remote system so that you can access it at a later time, such as to delete old replication images or for disaster recovery.

Syntax `delete remote-system` *`system`*

Parameters *`system`*
Name or network-port IP address of the remote system.

Example Delete remote system `System2`:

```
# delete remote-system System2
Success: Command deleted successfully. (System2) - The remote system was
deleted. (2012-01-21 12:24:18)
```

See also

- create remote-system
- remote
- set remote-system
- show remote-systems

delete replication-set

Description Dissolves a replication set. The replication volumes associated with the replication set are converted to master volumes and any replication snapshots associated with the replication volumes are converted to standard snapshots. Snapshots are converted regardless of the number of snapshots allowed by the system's license. This command must be run on the primary system.

Syntax `delete replication-set ID`

Parameters *ID*
Name or serial number of either the replication set or its primary volume.

Example Delete replication set `RS1`:

```
# delete replication-set RS1
Info: The replication set has been deleted. (RS1)
Success: Command completed successfully. (2012-01-21 12:16:58)
```

Delete the replication set with primary volume `MV1`:

```
# delete replication-set MV1
Info: The replication set has been deleted. (MV1)
Success: Command completed successfully. (2012-01-21 12:17:31)
```

See also
- show replication-sets
- show replication-volumes

delete schedule

Description Deletes a task schedule. If a component has a scheduled task that you no longer want to occur, you can delete the schedule. When a component is deleted, its schedules and tasks are also deleted.

Syntax `delete schedule` *`schedule`*

Parameters *`schedule`*
The schedule to delete.

Example Delete schedule `Sched1`:

```
# delete schedule Sched1
Success: Command completed successfully. (Sched1) - The schedule was deleted.
(2012-01-21 17:05:15)
```

See also
- show schedule-details
- show schedules

delete snap-pool

Description Deletes a snap pool.

NOTE: You must disassociate all master volumes from the snap pool before you can delete it.

Syntax `delete snap-pool` *`snap-pool`*

Parameters *`snap-pool`*
Name or serial number of the snap pool to delete. For volume syntax, see Command syntax on page 20.

Example Delete snap pool `SP1`:

```
# delete snap-pool SP1
Success: Command completed successfully. (SP1) - The snap-pool was deleted.
(2012-01-18 12:13:46)
```

See also
- show master-volumes
- show snap-pools

delete snapshot

Description Deletes specified snapshots. All data uniquely associated with the snapshot is deleted and associated space in the snap pool is freed for use. The snapshot's schedules are also deleted.

Syntax

```
delete snapshot
    [cleanup]
    [delete-priority standard-snapshot|volume-copy-snapshot|replication-snapshot
    |replicating-snapshot|common-sync-point-snapshot|only-sync-point-snapshot
    |queued-snapshot]
    [force]
    snapshots
```

Parameters

`cleanup`
Optional. When a master volume's last snapshot is deleted, automatically convert the master volume to a standard volume and delete the snap pool.

`delete-priority standard-snapshot|volume-copy-snapshot |replication-snapshot|replicating-snapshot|common-sync-point-snapshot |only-sync-point-snapshot|queued-snapshot`
Optional. Priority of snapshots that can be deleted. If the specified priority is less than the snapshot's priority, deletion is prevented. This is intended to protect against accidentally deleting high-priority snapshots. You must specify this parameter or the `force` parameter, but not both.

`force`
Optional. Overrides priority protection and forces the specified snapshot to be deleted. You must specify this parameter or the `delete-priority` parameter, but not both.

`snapshots`
Names or serial numbers of the snapshots to delete. For volume syntax, see Command syntax on page 20.

Example Delete snapshot `SS1`, which is being used in a replication operation:

```
# delete snapshot delete-priority replicating-snapshot SS1
Success: Command completed successfully. - The snapshot(s) were successfully
deleted. (2012-01-21 09:51:39)
```

Try to delete common-sync-point snapshot `SS2` by specifying a lower priority:

```
# delete snapshot delete-priority standard-snapshot SS2
Error: Snapshot priority has not been met. - One or more snapshots were not
deleted. (2012-01-21 09:49:10)
```

Force deletion of snapshot `SS2`:

```
# delete snapshot force SS2
Success: Command completed successfully. - The snapshot(s) were successfully
deleted. (2012-01-21 09:50:20)
```

Delete three standard snapshots:

```
# delete snapshot s1,s2,s3
Success: Command completed successfully. - The snapshot(s) were successfully
deleted. (2012-01-21 09:41:58)
```

See also

- delete snapshot-write-data
- show snapshots

delete snapshot-write-data

Description Deletes data written to a standard snapshot after it was created. Deleting this modified data reverts the snapshot to the state when it was first taken. This command is not allowed for a replication snapshot.

Syntax `delete snapshot-write-data` *`snapshot`*

Parameters *`snapshot`*
Name or serial number of the snapshot to delete modified data from. For volume syntax, see Command syntax on page 20.

Example Delete only modified data from snapshot `SS1`:

```
# delete snapshot-write-data SS1
Success: Command completed successfully. (SS1) - Snapshot write data was
deleted. (2012-01-21 09:54:58)
```

See also
- delete snapshot
- show snapshots

delete task

Description Deletes a task. If the task is scheduled, delete schedules that use the task.

Syntax `delete task task`

Parameters *task*
The task to delete.

Example Delete task `Task1`:

```
# delete task Task1
Success: Command completed successfully. (Task1) - The task was deleted.
(2012-01-21 17:05:46)
```

See also

- delete schedule
- show schedule-details
- show schedules
- show task-details
- show tasks

delete user

Description Deletes a user account. You can delete any user, including the default users. However, the system requires at least one CLI user with the `manage` role to exist.

Syntax

```
delete user
    [noprompt]
    name
```

Parameters

`noprompt`
Optional in console format; required for XML API format. Suppresses the confirmation prompt, which requires a yes or no response. Specifying this parameter allows the command to proceed without user interaction.

name
The user to delete. Names are case sensitive.

Example Delete user `jsmith`:

```
# delete user jsmith
Are you sure you want to delete user jsmith? yes
Success: Command completed successfully. (2011-10-10 15:55:16)
```

Delete user `Kim` and suppress the confirmation prompt:

```
# delete user noprompt Kim
Success: Command completed successfully. (2012-01-21 15:55:26)
```

Try to delete the only CLI user with the `manage` role:

```
# delete user SysAdmin
Error: At least one CLI user must retain configuration privileges at all times.
(2013-10-31 14:10:47)
```

See also

- show users

delete vdisks

Description Deletes specified vdisks. Unmaps and deletes all volumes and snapshots in the vdisks and disassociates all disks assigned to the vdisks.

△ **CAUTION:** Deleting a vdisk will delete all data on that vdisk.

NOTE:

- You cannot delete a vdisk if it contains a snap pool that is associated with a master volume on another vdisk.
- If you delete a quarantined vdisk and its missing disks are later found, the vdisk reappears as quarantined or offline and you must delete it again (to clear those disks).

Syntax

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

Parameters

`prompt yes|no`
Optional. Specifies an automatic response to the prompt that appears if a utility is running on the vdisk:

- `yes`: Stop the utility and allow the command to proceed.
- `no`: Cancel the command.

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

`vdisks`
Names or serial numbers of the vdisks to delete. For vdisk syntax, see Command syntax on page 20.

Example Delete vdisks `VD1 and VD2`:

```
# delete vdisks VD1,VD2
Info: Vdisk VD1 was deleted. (VD1) (2012-01-21 12:59:54)

Info: Vdisk VD2 was deleted. (VD2) (2012-01-21 12:59:54)

Success: Command completed successfully. (2012-01-21 12:59:54)
```

Delete vdisk `VD3` on which a utility is running:

```
# delete vdisks VD3
Vdisk VD3 has jobs running. Do you want to continue? yes
Info: Please wait - vdisks are being deleted.
Info: Vdisk VD3 was deleted. (VD3) (2012-01-21 13:00:18)

Success: Command completed successfully. (2012-01-21 13:00:18)
```

See also

- show master-volumes
- show vdisks

delete vdisk-spare

Description Deletes specified spares that are assigned to a vdisk.

Syntax

```
delete vdisk-spare
    disks disks
    vdisk
```

Parameters

`disks` *disks*
IDs of the spares to delete. For disk syntax, see Command syntax on page 20.

vdisk
Name or serial number of the vdisk to delete the spares from. For disk syntax, see Command syntax on page 20.

Example Delete spare disk 1.5 from vdisk `VD1`:

```
# delete vdisk-spare disks 1.5 VD1
Info: Vdisk spare disk 1.5 was deleted. (1.5)
Success: Command completed successfully. (2011-10-12 11:11:29)
```

See also

- delete global-spare
- set spares
- show disks
- show vdisks

delete volumes

Description Deletes specified volumes.

△ **CAUTION:** Deleting a volume will delete all data in that volume and its schedules.

Syntax `delete volumes` *`volumes`*

Parameters *`volumes`*
Names or serial numbers of the volumes to delete. For volume syntax, see Command syntax on page 20.

Example Delete volumes `V1 and V2`:

```
# delete volumes V1,V2
Info: Volume V1 was deleted. (V1) (2012-01-18 12:18:50)

Info: Volume V2 was deleted. (V2) (2012-01-18 12:18:50)

Success: Command completed successfully. (2012-01-18 12:18:50)
```

See also
- show volumes

dequarantine

Description Removes a vdisk from quarantine.

△ **CAUTION:** Carefully read this topic to determine whether to use the `dequarantine` command to manually remove a vdisk 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 vdisk 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 is applicable to your situation and for assistance in performing it. Also, see the help for the `trust` command.

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

The system will automatically quarantine a vdisk having a fault-tolerant RAID level if one or more of its disks becomes inaccessible, or to prevent invalid ("stale") data that may exist in the controller from being written to the vdisk. 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 vdisk to prevent invalid data from being written to the vdisk. 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 vdisk 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 vdisk will be automatically dequarantined if the inaccessible disks come online and the vdisk status becomes `FTOL` (fault tolerant and online), or if after 60 seconds the vdisk status is `QTCR` or `QTDN`.
- During system operation, a vdisk loses redundancy plus one more disk; for example, three disks are inaccessible in a RAID-6 vdisk or two disks are inaccessible for other fault-tolerant RAID levels. The vdisk will be automatically dequarantined if after 60 seconds the vdisk status is `FTOL`, `FTDN`, or `CRIT`.

Quarantine isolates the vdisk from host access and prevents the system from changing the vdisk 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 vdisk has one inaccessible disk. The vdisk is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the vdisk is `QTCR` or `QTDN`, the vdisk is automatically dequarantined.
- `QTCR` (quarantined critical): The vdisk is critical with at least one inaccessible disk. For example, two disks are inaccessible in a RAID-6 vdisk 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 vdisk is `QTCR` or `QTDN`, the vdisk is automatically dequarantined.
- `QTOF` (quarantined offline): The vdisk is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 vdisk.

When a vdisk 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 vdisk's volumes and volumes in other vdisks, quarantine may temporarily impact operation of those other volumes. For example, if the quarantined vdisk contains the snap pool used for snapshot, volume-copy, or replication operations, quarantine may temporarily cause the associated master volume to go offline; a volume-copy or replication operation can also be disrupted if an associated volume (snap pool, source volume, or destination volume) goes offline. Depending on the operation, the length of the outage, and the settings associated with the operation, the operation may automatically resume when the vdisk is dequarantined or may require manual intervention. A vdisk can remain quarantined indefinitely without risk of data loss.

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

- If the inaccessible disks come online, making the vdisk `FTOL`, the vdisk is automatically dequarantined.
- If after 60 seconds from being quarantined the vdisk is `QTCR` or `QTDN`, the vdisk is automatically dequarantined. The inaccessible disks are marked as failed and the vdisk 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 vdisk. 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 vdisk is dequarantined, event 173 is logged.

A quarantined vdisk 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 vdisk power up. Check that all enclosures have restarted after a power failure. If these problems are found and then fixed, the vdisk recovers and no data is lost.

If the inaccessible disks cannot be restored (for example, they failed), and the vdisk'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 vdisk becomes quarantined; when the disk is found, the vdisk is dequarantined and reconstruction starts. If reconstruction was in process, it continues where it left off.

NOTE: The only commands allowed for a quarantined vdisk are `dequarantine` and `delete vdisk`. If you delete a quarantined vdisk and its inaccessible disks later come online, the vdisk will reappear as quarantined or offline and you must delete it again (to clear those disks).

Syntax `dequarantine vdisk` *`vdisk`*

Parameters `vdisk` *`vdisk`*
Name or serial number of the vdisk to remove from quarantine. For vdisk syntax, see Command syntax on page 20.

Example After determining that vdisk `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
Success: Command completed successfully

# show vdisks
Name ... Status ...
-------------------
VD1  ... FTDN   ... (RAID 6 fault tolerant with a down disk)
-------------------
```

See also

- show vdisks
- trust

detach replication-volume

Description Prepares a secondary volume to be physically removed from a system.

When using the replication feature, if you chose to create a replication set's primary and secondary volumes in the primary system, you can perform the initial replication and then physically move the secondary volume's vdisk into the secondary system.

The process to move a secondary volume is:

1. In the system where the secondary volume resides:
   a. Detach the secondary volume.
   b. If the secondary volume's vdisk contains other secondary volumes, detach those volumes.
   c. Stop the secondary volume's vdisk.
   d. If the secondary volumes' snap pools are in other vdisks, stop those vdisks.
   e. Move the vdisks into the secondary system. This system must support the link type that the replication set is configured to use. For example, if the replication set's link type is configured to use FC links, the secondary system must have FC ports.
2. In the secondary system:
   a. Start the snap pools' vdisks.
   b. Start the secondary volumes' vdisks.
   c. Reattach the secondary volumes.

Detached volumes remain associated with their replication sets but are not updated with replication data or with replication control information. When a volume is detached its status is shown as `Detached`.

NOTE: It is recommended that the vdisk that you are moving contains only secondary volumes and their snap pools. You are allowed to move other volumes along with secondary volumes and their snap pools, but be sure that you are doing so intentionally.

NOTE: If you intend to move a vdisk's enclosure and you want to allow I/O to continue to the other enclosures, it is best if it is at the end of the chain of connected enclosures. If the enclosure is in the middle of the chain, the enclosures must be cabled with no single point of failure, so that removing the enclosure does not prevent communication between other enclosures.

Syntax

```
detach replication-volume
    [set replication-set]
    replication-volume
```

Parameters

`set` *`replication-set`*
Optional. Name or serial number of the replication set.

`replication-volume`
Name or serial number of the replication volume to detach. If the name is not unique across replication sets, specify the `set` parameter.

Example Detach secondary volume `rV1`:

```
# detach replication-volume rV1
Success: Command completed successfully. (2012-01-21 10:32:02
```

See also

- reattach replication-volume
- show replication-sets
- show replication-volumes
- start vdisk
- stop vdisk

exit

Description Log off and exit the CLI session.

Syntax `exit`

expand snap-pool

Description Expands a snap pool. Expansion is restricted to the space available on the vdisk containing the snap pool. If insufficient space is available for expansion on the vdisk, first expand the vdisk by using expand vdisk.

Syntax To expand by a specific size:

```
expand snap-pool
   size size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]
   snap-pool
```

To expand to the maximum size:

```
expand snap-pool
   size max
   snap-pool
```

Parameters `size` *`size`*`[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
Specifies the size using the current base, as shown by the show cli-parameters command. The unit can be specified as follows:

- If base 2 is in use: `B` (bytes), `KiB` (kibibytes), `MiB` (mebibytes), or `GiB` (gibibytes).
- If base 10 is in use: `B` (bytes), `KB` (kilobytes), `MB` (megabytes), or `GB` (gigabytes).

If no unit is specified, the unit is 512-byte blocks.

`size max`
Expands the volume to fill available space on the vdisk.

`snap-pool`
Name or serial number of the snap pool to expand. For volume syntax, see Command syntax on page 20.

Example Expand snap pool `SP1` by 100 GB:

```
# expand snap-pool size 100GB SP1
Success: Command completed successfully. (spData) - Expansion of volume spData
was started. (2012-01-21 11:08:31)
```

See also

- show snap-pools
- show vdisks

expand vdisk

Description Adds disks to a vdisk. All disks used in a vdisk and its spares must be either SAS or SATA; mixing disk types is not supported. Adding single-ported disks to a vdisk that contains dual-ported disks is supported; however, because single-ported disks are not fault-tolerant, a confirmation prompt will appear.

The expansion capability for each supported RAID level is:

RAID level	Expansion capability	Maximum disks
NRAID	Cannot expand.	1
0, 3, 5, 6	Can add 1–4 disks at a time.	16
1	Cannot expand.	2
10	Can add 2 or 4 disks at a time.	16
50	Can expand the vdisk one RAID-5 sub-vdisk at a time. The added RAID-5 sub-vdisk must contain the same number of disks as each original sub-vdisk.	32

IMPORTANT: Vdisk expansion cannot be stopped and can take days to complete, depending on disk type, RAID level, and other factors.

Syntax

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

Parameters

`disks` *disks*
IDs of the disks to add. For disk syntax for RAID levels other than RAID 10 and RAID 50, see Command syntax on page 20. For RAID 10 and RAID 50, you must use a comma (not a colon) to separate each mirror pair or sub-vdisk.

`prompt yes|no`
Optional. Specifies an automatic response to the confirmation prompt:

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

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

vdisk
Name or serial number of the vdisk to expand. For vdisk syntax, see Command syntax on page 20.

Example Expand vdisk `VD1` to include disk 1.11:

```
# expand vdisk disks 1.11 VD1
Success: Command completed successfully. - Expansion of vdisk was started.
(2012-01-21 12:19:36)
```

Expand RAID-10 vdisk `R10` to include two additional mirror pairs:

```
# expand vdisk disks 2.4,2.8,2.9-10 R10
```

Expand RAID-50 vdisk `R50`, which has three 3-disk sub-vdisks, to include one additional 3-disk sub-vdisk:

```
# expand vdisk disks 2.1-2,2.5 R50
```

See also

- show disks
- show vdisks

expand volume

Description Expands a standard volume. Expansion is restricted to the space available on the vdisk containing the volume. If insufficient space is available for expansion on the vdisk, first expand the vdisk by using expand vdisk.

To expand a master volume:

1. Delete all of its snapshots by using delete all-snapshots.
2. Convert it to a standard volume by using convert master-to-std.
3. Expand the standard volume by using expand volume.
4. Convert the expanded volume to a master volume by using convert std-to-master.

Syntax To expand by a specific size:

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

To expand to the maximum size:

```
expand volume
   size max
   volume
```

Parameters `size size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
Specifies the size using the current base, as shown by the show cli-parameters command. The unit can be specified as follows:

- If base 2 is in use: `B` (bytes), `KiB` (kibibytes), `MiB` (mebibytes), or `GiB` (gibibytes).
- If base 10 is in use: `B` (bytes), `KB` (kilobytes), `MB` (megabytes), or `GB` (gigabytes).

If no unit is specified, the unit is 512-byte blocks.

`size max`
Expands the volume to fill the available space on the vdisk.

volume
Name or serial number of the volume to expand. For volume syntax, see Command syntax on page 20.

Example Expand standard volume `V1` by 100 GB:

```
# expand volume size 100GB V1
Success: Command completed successfully. - Expansion of volume V1 was
successful. (2012-09-19 10:16:05)
```

See also

- expand vdisk
- show vdisks
- show volumes

export snapshot

Description Exports a replication snapshot on the local system to a new standard snapshot. The standard snapshot will reside in the same snap pool, take a snapshot license, and be independent of the replication snapshot. The standard snapshot can used like any other standard snapshot, and changes to it will not affect the replication snapshot.

The standard snapshot is subject to the snap pool's deletion policies. If the snap pool reaches its critical threshold, the snapshot may be deleted, even if it is mapped. If you want to preserve the snapshot's data, you can create a standard volume from the snapshot; see the volumecopy command.

The export command will not succeed if the replication snapshot is on a remote system or if the resulting snapshot would exceed license limits.

Syntax

```
export snapshot
   name standard-snapshot
   [set replication-set]
   replication-snapshot
```

Parameters

`name` *`standard-snapshot`*
A name for the resulting snapshot.

`set` *`replication-set`*
Optional. Name or serial number of the replication set.

`replication-snapshot`
Name or serial number of the replication snapshot to export. If the name is not unique across replication sets, specify the `set` parameter.

Example Export local replication snapshot `RepSnap1` to standard snapshot `Snap1`:

```
# export snapshot name Snap1 RepSnap1
Info: The exported snapshot will reside in the snap pool. If the snap pool
reaches its critical threshold, the snapshot may be deleted, even if it is
mapped. To preserve the exported snapshot's data, create a volume copy of the
exported snapshot.
Info: The snapshot has been exported. (Snap1)
Success: Command completed successfully. (2012-01-21 12:10:32)
```

See also

- show replication-sets
- show snapshots

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 hosts have to the volume, and the LUN presented to all hosts 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 hosts. Optionally, you can specify the LUN, ports, and access level for a mapping. A mapping can make a volume accessible to hosts, or inaccessible to hosts (known as *masking*). For example, assume a volume's default mapping allows read-only access using LUN 5. You can give one host read-write access using LUN 6, and you can give a second host no access to the volume.

NOTE: You cannot map a replication set's secondary volume.

NOTE: When mapping a volume to a host 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."

Syntax

```
map volume
    [access read-write|rw|read-only|ro|no-access]
    [mapping ports.LUN]
    [lun LUN]
    [ports ports]
    [host hosts]
    volumes
```

Parameters

`access read-write|rw|read-only|ro|no-access`
Optional. The access permission available to attached hosts: read-write (rw), read-only (ro), or no-access. If the access parameter is specified as read-write or read-only, either the `mapping` parameter or the `lun` parameter must be specified. For an explicit mapping, `no-access` causes the volume to be masked from specified hosts. If the `access` parameter is omitted, access is set to `read-write`.

`mapping` *`ports.LUN`*
Deprecated; use the `ports` and `lun` parameters.

`lun` *`LUN`*
Optional. The LUN to use for the mapping. If a single volume and multiple hosts are specified, the same LUN is used for each host. If multiple volumes and a single host are specified, the LUN will increment for the second and subsequent volumes. If multiple volumes and hosts are specified, each host 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. Do not use the `lun` parameter with the `mapping` parameter.

`ports` *`ports`*
Optional. The ports to use for the mapping; any unspecified ports become unmapped. In a hybrid system, select either FC or iSCSI ports, not both. 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. Do not use the `ports` parameter with the `mapping` parameter.

`host` *hosts*
Optional. For FC and SAS, the nickname or 16-hex-digit WWPN of each host to map the volumes to. For iSCSI, the node name (typically the IQN) or nickname of each initiator to map the volumes to. For nickname syntax, see Command syntax on page 20. If the host parameter is specified, either the `mapping` parameter or both the `lun` and `ports` parameters must be specified. If the `host` parameter is omitted, the mapping applies to all hosts that are not explicitly mapped.

volumes
Names or serial numbers of the volumes to map. For volume syntax, see Command syntax on page 20.

Example Map volume `v2` with read-only access for `Host1`, using port A1 and LUN 100:

```
# map volume access ro ports a1 lun 100 host Host1 v2
Info: Mapping succeeded. Host 207000c0ff001121 was mapped for volume v2 with LUN
100. (v2) (2012-01-18 13:58:06)
Success: Command completed successfully. (2012-01-18 13:58:06)
```

Map volumes `v2` and `v3` with read-write access for `Host2`, using ports A1 and B1 and LUN 101:

```
# map volume access rw ports a1,b1 lun 101 host Host2 v2,v3
Info: Mapping succeeded. Host 207000c0ff001122 was mapped for volume v2 with LUN
101. (v2) (2012-01-18 13:58:41)

Info: Mapping succeeded. Host 207000c0ff001122 was mapped for volume v3 with LUN
102. (v3) (2012-01-18 13:58:41)

Success: Command completed successfully. (2011-09-28 13:58:41)
```

Mask volume `v4` from `Host1` and `Host3`:

```
# map volume v4 access no-access host Host1,Host3
Info: Mapping succeeded. Host 207000c0ff001121 was mapped for volume v4 with LUN
0. (v4) (2012-01-18 13:59:50)

Info: Mapping succeeded. Host 207000c0ff001123 was mapped for volume v4 with LUN
0. (v4) (2012-01-18 13:59:50)

Success: Command completed successfully. (2012-01-18 13:59:50)
```

Map volumes `v1` and `v2` to hosts `Host1` and `Host2`, using ports A1 and B1 starting with LUN 6, and view the results:

```
# map volume ports a1,b1 lun 6 host Host1,Host2 v1,v2
Info: Mapping succeeded. Host 207000c0ff001121 was mapped for volume v1 with LUN
6. (v1) (2012-01-18 14:01:03)

Info: Mapping succeeded. Host 207000c0ff001122 was mapped for volume v1 with LUN
6. (v1) (2012-01-18 14:01:03)

Info: Mapping succeeded. Host 207000c0ff001121 was mapped for volume v2 with LUN
7. (v2) (2012-01-18 14:01:03)

Info: Mapping succeeded. Host 207000c0ff001122 was mapped for volume v2 with LUN
7. (v2) (2012-01-18 14:01:03)

Success: Command completed successfully. (2012-01-18 14:01:03)
```

```
# show volume-maps
Volume View [Serial Number (SN) Name (v1) ] Mapping:
   Ports LUN   Access       Host-Port-Identifier Nickname
   -----------------------------------------------------
   A1,B1 6     read-write   207000c0ff001121     Host1
   A1,B1 6     read-write   207000c0ff001122     Host2
               not-mapped   all other hosts

Volume View [Serial Number (SN) Name (v2) ] Mapping:
   Ports LUN   Access       Host-Port-Identifier Nickname
   -----------------------------------------------------
   A1,B1 7     read-write   207000c0ff001121     Host1
   A1,B1 7     read-write   207000c0ff001122     Host2
               not-mapped   all other hosts

Success: Command completed successfully. (2012-01-18 14:44:01)
```

See also

- show host-maps
- show hosts
- show volume-maps
- show volumes
- unmap volume

meta

Description In XML API format only, shows all property metadata for objects. This includes data not shown in `brief` mode. The data is static and never changes.

Syntax `meta` *basetypes*

Parameters *basetypes*
A basetype or a list of basetypes separated by commas (with no spaces) to specify the objects to show metadata for. The basetypes are:

```
advanced-settings-table
attribute-priorities
auto-write-through-trigger
cache-parameter
cache-settings
certificate-status
chap-records
cli-parameters
compact-flash
controller-cache-parameters
controllers
controller-statistics
debug-log-parameters
disk-hist-statistics
disk-statistics
drive-parameters
drives
drive summary
email-parameters
enclosure-components
enclosure-fru
enclosure-list
enclosures
enclosure-sku
events
expander-ports
fan
fc-port
host-port-statistics
hosts
host-view
host-view-mappings
inquiry
iscsi-parameters
iscsi-port
job-parameters
license
log-header-table
managed-logs
master-volumes
network-parameters
ntp-status
policy-threshold
port
power-supplies
redundancy
refresh-counters
remote-addresses
remote-links
remote-system
replicate-volume-tasks
replication-image
replication-image-params
replication-set
replication-volume
replication-volume-summary
reset-snapshot-tasks
sas-port
sas-status-controller-a
schedules
security-communications-protocols
sensors
ses
shutdown-status
snap-pools
snapshots
snapshot-with-retention-tasks
snap-tasks
snmp-parameters
status
system
system-parameters-table
tasks
time-settings-table
unhealthy-component
unwritable-cache
users
vdisk-hist-statistics
vdisk-statistics
versions
virtual-disks
virtual-disk-summary
volume-copy-status
volume-copy-tasks
volume-names
volume-reservations
volumes
volume-statistics
volume-view
volume-view-mappings
```

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

```
# meta drives
```

See also
- set cli-parameters

ping

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

Syntax

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

Parameters

host-address
The remote host's IP address in dotted decimal form.

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

Example Send two packets to the remote computer at 10.134.50.6:

```
# ping 10.134.50.6 2
Info: Pinging 10.134.50.6 with 2 packets.
Success: Command completed successfully. - The remote computer responded with 2
packets. (2012-01-21 17:13:00)
```

reattach replication-volume

Description Reattaches a secondary volume to its replication set.

Reattaching a secondary volume is the last part of the process for moving a secondary volume from a primary system into a secondary system. The process to move a secondary volume is:

1. In the system where the secondary volume resides:
   a. Detach the secondary volume.
   b. If the secondary volume's vdisk contains other secondary volumes, detach those volumes.
   c. Stop the secondary volume's vdisk.
   d. If the secondary volumes' snap pools are in other vdisks, stop those vdisks.
   e. Move the vdisks into the secondary system. This system must support the link type that the replication set is configured to use. For example, if the replication set's link type is configured to use FC links, the secondary system must have FC ports.
2. In the secondary system:
   a. Start the snap pools' vdisks.
   b. Start the secondary volumes' vdisks.
   c. Reattach the secondary volumes.

If the reattach operation succeeds, the secondary volume's status changes to `Establishing proxy` while it is establishing the connection to the remote (primary) system in preparation for replication; then the status changes to `Online`. The replication set is ready to resume replication operations.

If the reattach operation fails and says it is unable to get the primary volume's link type, the vdisk that contains the secondary volume may not have completed its startup activities. Wait approximately one minute for these activities to complete, then retry the operation. If this message continues to occur, check the event log to better understand the condition and for an indication of how to correct it.

NOTE: If the secondary system does not support the link type that the replication set is configured to use, the secondary volume will be attached with the wrong link type. To fix this, repeat process steps 1 and 2 above to move the secondary volume into a system that supports the required link type.

Syntax

```
reattach replication-volume
    [remote-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs]
    [set replication-set]
    replication-volume
```

Parameters

`remote-address ip=`*`IPs`*`|wwnn=`*`WWNNs`*`|wwpn=`*`WWPNs`*
Optional. Specifies host ports on the system where the secondary volume resides, 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.

`set` *`replication-set`*
Optional. Name or serial number of the replication set.

`replication-volume`
Name or serial number of the replication volume. If the name is not unique across replication sets, specify the `set` parameter.

Example Reattach secondary volume `rV1`:

```
# reattach replication-volume rV1
Success: Command completed successfully. (2012-01-21 10:40:33)
```

See also

- detach replication-volume
- show replication-sets
- show replication-volumes
- start vdisk
- stop vdisk

release volume

Description Clears host registrations and releases persistent reservations for all or specified volumes. Normally, reservations placed on volumes by hosts 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 hosts, which may result in data corruption. Before issuing this command, quiesce all hosts that have visibility to the volumes whose reservations will be released.

Syntax `release volume all|`*`volumes`*

Parameters `all|`*`volumes`*
Specifies all volumes, or the names or serial numbers of specific volumes. For volume syntax, Command syntax on page 20.

Example Release reservations for a specific volume:

```
# release volume vd04_v002
Success: Command completed successfully. (2011-11-08 09:01:25)
```

See also
- show volume-reservations
- show volumes

remote

Description Runs a command on a remote system that is associated with the local system. If the command cannot connect to remote controller A, it tries to connect to remote controller B; if unsuccessful, the remote command is not run. Output is displayed in console or XML API format depending on the local system's setting.

Syntax

```
remote
    system
    command
```

Parameters

system
Name or network-port IP address of the remote system.

command
Any CLI command that is valid for the remote user's access level.

Example Run the `show vdisks` command on remote system `System2`:

```
# remote System2 show vdisks
Name  Size     Free     Own  Pref  RAID    Disks  Spr  Chk   Status  Jobs
  Job%  Serial Number  Drive Spin Down         Spin Down Delay
------------------------------------------------------------------------
VD1   587.1GB  116.7GB  B    B     RAID50  6      0    64k   FTOL    VRSC
  41%   SN             Disabled               0
VD2   146.5GB  95.7GB   A    A     RAID0   2      0    64k   UP
        SN             Enabled - all spinning  1
------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-21 12:22:16)
```

See also

- show remote-systems

remove replication-volume

Description Removes a secondary volume from a replication set. The secondary volume is converted to a master volume. Any replication snapshots associated with that volume are converted to standard snapshots, regardless of the number of snapshots allowed by the system's license.

You must run this command on the primary system. You cannot remove the primary volume.

Syntax

```
remove replication-volume
    [nowait]
    [primary-volume volume]
    [set replication-set]
    replication-volume
```

Parameters

`nowait`
Optional. Removing a volume from a replication set can take the Storage Controller several minutes to complete. This parameter allows that processing to continue in the background so the Management Controller can process other commands.

`primary-volume` *`volume`*
Optional; use only if the replication set has a primary-volume conflict. Name or serial number of the primary volume.

`set` *`replication-set`*
Optional. Name or serial number of the replication set.

`replication-volume`
Name or serial number of the secondary volume to remove. If the name is not unique within the replication set, the volume that is not the primary volume is removed. If the name is not unique across replication sets, specify the `set` parameter.

Example Remove secondary volume `rData` from a replication set:

```
# remove replication-volume rData
Info: Started removing the secondary volume from the replication set. (rData)
Info: Verifying that the secondary volume was removed from the replication set.
This may take a couple of minutes... (rData)
Info: The secondary volume was removed from the replication set. (rData)
Success: Command completed successfully. (2012-01-21 12:53:33)
```

See also

- show replication-sets
- show replication-volumes

replicate snapshot

Description Initiates a replication operation using an existing snapshot as the data source. This command replicates the specified external standard snapshot.

If the specified snapshot has not already been replicated on the replication volume, each replication volume in the replication set is requested to replicate the snapshot data. Only snapshot preserved data is replicated; snapshot modified data is not replicated.

If you instead want to create and replicate a snapshot as a single task, use the replicate volume command.

Syntax

```
replicate snapshot
    [name replication-snapshot]
    [set replication-set]
    external-snapshot
```

Parameters

`name` *`replication-snapshot`*
Optional. A name for the resulting replication snapshot.

`set` *`replication-set`*
Optional. Name or serial number of the replication set.

`external-snapshot`
Name or serial number of the external snapshot to use as the data source. If the name is not unique across replication sets, specify the `set` parameter.

Example Replicate external snapshot `Snap1` and name the resulting replication snapshot `RepSnap1`:

```
# replicate snapshot name RepSnap1 Snap1
Info: The replication has started. (RepSnap1)
Success: Command completed successfully. (2012-01-21 12:49:39)
```

See also

- show replication-sets
- show snapshots

replicate volume

Description Creates a replication snapshot of the specified volume and initiates a replication operation. This command can follow a create replication-set command that did not specify to initiate replication.

If the snapshot you want to replicate already exists, use the replicate snapshot command instead.

NOTE: If replication requests are sent to a secondary system whose temporary replication license has expired, the requests are queued but are not processed, and the secondary system reports event 472. If this condition occurs, check for this event in the event log, event-notification emails, and SNMP traps. To continue using replication, purchase a permanent replication license.

Syntax

```
replicate volume
   [set replication-set]
   snapshot replication-snapshot
   [preserve-snapshot external-snapshot]
   volume
```

Parameters

`set replication-set`
Optional. Name or serial number of the replication set.

`snapshot replication-snapshot`
Name for the new replication snapshot.

`preserve-snapshot external-snapshot`
Optional. Name of the external snapshot to use as the source for this replication. This preserves the snapshot that is being used to replicate the volume as an external snapshot; otherwise, the snapshot is converted to a replication snapshot.

`volume`
Name or serial number of the primary volume to replicate. If the name is not unique across replication sets, specify the `set` parameter.

Example Replicate volume `MV1` and name the replication snapshot `RepSnap1`:

```
# replicate volume snapshot RepSnap1 MV1
Info: The replication has started. (RepSnap1)
Success: Command completed successfully. (2012-01-20 10:53:25)
```

See also

- show replication-sets
- show replication-volumes

rescan

Description This command forces rediscovery of disks and enclosures in the storage system. 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 disks; the controllers automatically detect these changes. When disks are inserted they are detected after a short delay, which allows the disks to spin up

Syntax `rescan`

Example Scan for device changes and re-evaluate enclosure IDs:

```
# rescan
Success: Command completed successfully. (2012-01-21 12:20:57)
```

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 quarter hour.

Syntax

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

Parameters

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

`prompt yes|no`
Optional. For scripting, this specifies an automatic response 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.

Example Reset all live statistics for both controllers:

```
# reset all-statistics
Success: Command completed successfully. (2012-01-21 11:34:40)
```

Reset all historical disk-performance statistics for both controllers:

```
# reset all-statistics historical
This command will reset all historical disk statistics.
Do you want to reset? yes
Success: Command completed successfully. (2012-01-21 11:34:50)
```

See also

- reset controller-statistics
- reset disk-error-statistics
- reset disk-statistics
- reset host-port-statistics
- reset vdisk-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. To reset this, restart or power cycle a controller.

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.

Example Reset statistics for both controllers:

```
# reset controller-statistics
Success: Command completed successfully. (2012-01-21 11:35:06)
```

See also

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

reset disk-error-statistics

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

- Number of SMART events recorded
- Number of I/O timeouts accessing the disk
- Number of times the disk did not respond
- Number of attempts by the controllers to spin up the disk
- Number of media errors (errors generated by the disk as specified by its manufacturer)
- Number of non-media errors (errors generated by the controllers or by the disk and not categorized as media errors)
- Number of block reassignments
- Number of bad blocks found

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

Syntax

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

Parameters

disks
Optional. IDs of the disks to reset statistics for. For disk syntax, see Command syntax on page 20. If this parameter is omitted, statistics are reset for all disks.

Example Reset error statistics for disks 1.1 and 2.1:

```
# reset disk-error-statistics 1.1,2.1
Success: Command completed successfully. (2012-01-21 11:35:34)
```

See also

- reset all-statistics
- reset controller-statistics
- reset disk-statistics
- reset host-port-statistics
- reset vdisk-statistics
- reset volume-statistics
- show disk-statistics
- show disks

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.

Syntax

```
reset disk-statistics
```

Example Reset statistics for all disks:

```
# reset disk-statistics
Success: Command completed successfully. (2012-01-21 11:35:52)
```

See also

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

reset host-link

Description Resets specified controller host ports (channels).

For an FC host port configured to use FC-AL (loop) topology, a loop initialization primitive (LIP) is issued.

For iSCSI, resetting a port might reset other ports.

For SAS, resetting a host port issues a `COMINIT/COMRESET` sequence and might reset other ports.

Syntax `reset host-link ports` *`ports`*

Parameters `port` *`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.

Example Reset the host link on port A1:

```
# reset host-link ports A1
Success: Command completed successfully. - Reset Host Link(s) on port(s) A1 from
current controller. (2012-01-21 11:36:28)
```

See also
- show ports

reset host-port-statistics

Description Resets performance statistics for controller host ports.

Syntax `reset host-port-statistics [ports ports]`

Parameters `ports ports`
Optional. The controller ID and port number of ports to reset statistics for. For port syntax, see Command syntax on page 20. If this parameter is omitted, statistics are reset for all controller host ports.

Example Reset statistics for all controller host ports:

```
# reset host-port-statistics
Success: Command completed successfully. (2012-01-21 11:36:59)
```

See also

- reset all-statistics
- reset controller-statistics
- reset disk-error-statistics
- reset disk-statistics
- reset vdisk-statistics
- reset volume-statistics
- show host-port-statistics
- show ports

reset smis-configuration

Description Resets the SMI-S configuration files. 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.

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. Specifies an automatic response to the confirmation prompt:

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

If this parameter is omitted, you must reply to the prompt.

`noprompt`
Optional in console format; required for XML API format. Suppresses the confirmation prompt, which requires a yes or no response. Specifying this parameter allows the command to proceed without user interaction.

Example Reset the SMI-S configuration on controller A, which you are logged in to:

```
# reset smis-configuration a
WARNING: The configuration of the SMIS service will be reset to default
settings.  Any hosts registered via SMIS will need to be registered again. Are
you sure? yes
Info: SMIS service configuration has been reset for local controller.
(2013-01-10 16:53:51)


Success: Command completed successfully. (2013-01-10 16:53:51)
```

From controller A, reset the SMI-S configuration on controller B:

```
# reset smis-configuration b
WARNING: The configuration of the SMIS service will be reset to default
settings.  Any hosts registered via SMIS will need to be registered again. Are
you sure? yes
Info: SMIS service configuration has been reset for partner controller.
(2013-01-10 16:55:08)


Success: Command completed successfully. (2013-01-10 16:55:08)
```

Reset the SMI-S configuration on both Storage Controllers:

```
# reset smis-configuration both
WARNING: The configuration of the SMIS service will be reset to default
settings.  Any hosts registered via SMIS will need to be registered again. Are
you sure? yes
Info: SMIS service configuration has been reset for local controller.
(2013-01-10 16:56:41)


Info: SMIS service configuration has been reset for partner controller.
(2013-01-10 16:56:41)


Success: Command completed successfully. (2013-01-10 16:56:41)
```

See also • restore defaults

reset snapshot

Description Deletes the data in a standard snapshot and resets it to the current data in the associated master volume. The snapshot's volume characteristics are not changed. The command prompts you to unmount/unpresent/unmap the snapshot from hosts before performing the reset; leaving it mounted can cause data corruption. This command is not allowed for a replication snapshot.

△ **CAUTION:** All data represented by the snapshot as it exists prior to issuing this command is lost.

Syntax

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

Parameters

`prompt yes|no`
Optional. Specifies an automatic response to the prompt to unmount/unpresent/unmap the snapshot before proceeding:

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

If this parameter is omitted, you must reply to the prompt.

`volume`
Name or serial number of the snapshot to reset. For volume syntax, see Command syntax on page 20.

Example Reset snapshot `SS1`:

```
# reset snapshot SS1
You MUST unmount the snapshot from all hosts before resetting it.
Ready to continue? yes
Success: Command completed successfully. - The reset of a snapshot completed.
(SS1) - The reset of a snapshot completed. (2012-01-21 13:02:59)
```

See also

- show snapshots

reset vdisk-statistics

Description Resets performance statistics for all or specified vdisks.

Syntax `reset vdisk-statistics [vdisks]`

Parameters *vdisks*
Optional. Names or serial numbers of the vdisks to reset statistics for. For vdisk syntax, see Command syntax on page 20. If this parameter is omitted, statistics are reset for all vdisks.

Example Reset statistics for vdisks `VD1` and `MyVdisk`:

```
# reset vdisk-statistics VD1,MyVdisk
Success: Command completed successfully. (2012-01-21 11:37:44)
```

See also

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

reset volume-statistics

Description Resets performance statistics for all or specified volumes.

Syntax `reset volume-statistics [volumes]`

Parameters *volumes*
Optional. Names or serial numbers of the volumes to reset statistics for. For volume syntax, see Command syntax on page 20. If this parameter is omitted, statistics are reset for all volumes.

Example Reset statistics for volume `vd1_v001`:

```
# reset volume-statistics vd1_v001
Success: Command completed successfully. (2012-01-21 11:38:05)
```

See also

- reset all-statistics
- reset controller-statistics
- reset disk-error-statistics
- reset disk-statistics
- reset host-port-statistics
- reset vdisk-statistics
- show volume-statistics
- show volumes

restart

Description Restarts the Storage Controller or Management Controller in a controller module.

If 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 controller restarts. The Management Controller is not restarted so it can provide status information to external interfaces.

If 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.

△ **CAUTION:** If you restart both controller modules, you and users lose access to the system and its data until the restart is complete.

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.

Syntax

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

Parameters

`sc|mc`
The controller to restart:

- `sc`: Storage Controller.
- `mc`: Management Controller.

`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 in console format; required for XML API format. Suppresses the confirmation prompt, which requires a yes or no response. Specifying this parameter allows the command to proceed without user interaction.

Example Restart the Management Controller in controller A, which you are logged in to:

```
# restart mc a
During the restart process you will briefly lose communication with the
specified Management Controller(s).
Continue? yes
Info: Restarting the local MC (A)...
Success: Command completed successfully. (2012-01-21 11:38:47)
```

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

```
# restart sc b
Success: Command completed successfully. - SC B was restarted. (2012-01-21
11:42:10)
```

Restart both Storage Controllers:

```
# restart sc both
Restarting both controllers can cause a temporary loss of data availability.
Do you want to continue? yes
Success: Command completed successfully. - Both SCs were restarted.  (2012-01-21
13:09:52)
```

See also

- shutdown

restore defaults

Description **For use by or with direction from a service technician.**

Restores the default configuration to the controllers. For details about which settings are restored see Settings changed by restore defaults on page 517. If the system contains only one controller module when the command is issued, the controller's redundancy mode will be set to `Single Controller` mode.

△ **CAUTION:** This command changes how the system operates and might require some reconfiguration to restore host access to volumes.

Syntax

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

Parameters

`noprompt`
Optional in console format; required for XML API format. Suppresses the confirmation prompt, which requires a yes or no response. Specifying this parameter allows the command to proceed without user interaction.

`prompt yes|no`
Optional. Specifies an automatic response to the confirmation prompt:

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

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

Example Restore the controllers' default configuration:

```
# restore defaults
WARNING: The configuration of the array controller will be re-set to default
settings. The Management Controller will restart once this is completed. Are you
sure? yes
Success: Command completed successfully. - Device default configuration was
restored.
```

See also

- reset smis-configuration
- restart

resume replication

Description Resumes a suspended replication operation on the specified secondary volume. This command must be issued on the system that owns the secondary volume.

Syntax

```
resume replication
    [set replication-set]
    replication-volume
```

Parameters

`set` *`replication-set`*
Optional. Name or serial number of the replication set.

`replication-volume`
Name or serial number of the secondary volume. If the name is not unique across replication sets, specify the `set` parameter.

Example Resume replication of primary volume `V1` to secondary volume `rV1`:

```
# resume replication rV1
Success: Command completed successfully. (2012-01-20 14:51:14)
```

See also

- abort replication
- show replication-sets
- show replication-volumes

rollback master-volume

Description Rolls back (reverts) the data on a master volume to the data that exists in a specified snapshot. You can choose whether to include modified write data from the snapshot in the rollback. You must unmount/unpresent/unmap the master volume from hosts before using this command. The command will prompt you to ensure the master volume is unmounted/unpresented/unmapped before proceeding.

△ **CAUTION:** All data that differs between the master volume and the snapshot is lost. Create a snapshot of the master volume as it currently exists before performing a rollback.

Syntax

```
rollback master-volume
    snapshot snapshot
    [modifiedsnapshot yes|no]
    [prompt yes|no]
    master-volume
```

Parameters

`snapshot` *`snapshot`*
Name or serial number of the snapshot containing the data to roll back to. For volume syntax, see Command syntax on page 20.

`modifiedsnapshot yes|no`
Optional. Specifies whether to include or exclude modified write data from the snapshot in the rollback.

- `yes`: Include modified snapshot.
- `no`: Exclude modified snapshot data.

If this parameter is omitted, modified snapshot data is excluded.

`prompt yes|no`
Optional. Specifies an automatic response to the prompt to unmount/unpresent/unmap the master volume before proceeding.

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

If this parameter is omitted, you must reply to the prompt.

`master-volume`
Name or serial number of the master volume to roll back. For volume syntax, see Command syntax on page 20.

Example Roll back master volume `MV1` to snapshot `SS1`:

```
# rollback master-volume snapshot SS1 MV1
You MUST unmount the master volume and the snapshot from all hosts before
starting a rollback operation.
Ready to continue? yes
Success: Command completed successfully. (MV) - Rollback was started.
(2012-01-21 11:45:40)
```

See also

- show master-volumes
- show snapshots

scrub disks

Description Analyzes specified disks to find and fix disk errors. This command acts on available disks, global spares, and dedicated spares, but not on leftover disks. This command will fix bad-block replacement errors, medium errors, hard errors, and SMART-count errors for the specified disks.

You can use a disk while it is being scrubbed. To check the progress of a disk scrub (DRSC) job, use the show disks command.

When a disk scrub operation starts, event 208 is logged. When a disk scrub operation ends, event 209 is logged and specifies whether errors were found and whether user action is required.

Syntax

```
scrub disks disks
```

Parameters

disks
IDs of the disks to scrub. For vdisk syntax, see Command syntax on page 20.

Example Start scrubbing disks 1.1 and 1.3:

```
# scrub disks 1.1,1.3
Info: Start scrubbing the disk at location -  (1.1)
Info: Start scrubbing the disk at location -  (1.3)
Success: Command completed successfully. (2012-10-08 11:14:11)
```

See also

- abort scrub
- scrub vdisk
- set advanced-settings
- set job-parameters
- show disks

scrub vdisk

Description Analyzes specified vdisks to find and fix disk errors. This command acts on disks in a vdisk but not dedicated spares or leftover disks. This command will fix parity mismatches for RAID 3, 5, 6, and 50; mirror mismatches for RAID 1 and 10; and media errors for all RAID levels.

Vdisk scrub can last over an hour, depending on vdisk size, utility priority, and amount of I/O activity. However, a "foreground" scrub performed with this command is typically faster than a background scrub enabled with the set job-parameters command. You can use a vdisk while it is being scrubbed. To check the progress of a vdisk scrub (VRSC) job, use the show vdisks command.

When a vdisk scrub operation starts, event 206 is logged. When a vdisk scrub operation ends, event 207 is logged and specifies whether errors were found and whether user action is required.

Syntax `scrub vdisk vdisks`

Parameters *vdisks*
Names or serial numbers of the vdisks to scrub. For vdisk syntax, see Command syntax on page 20.

Example Start scrubbing vdisk `vd1`:

```
# scrub vdisk vd1
Info: Scrub was started on vdisk vd1. (vd1)
Success: Command completed successfully. (2012-01-20 15:41:38)
```

See also

- abort scrub
- scrub disks
- set advanced-settings
- set job-parameters
- show vdisks

set advanced-settings

Description Sets advanced system configuration options.

Syntax

```
set advanced-settings
    [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]
    [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]
    [smart enabled|disabled|on|off|detect-only]
    [super-cap-failure enabled|disabled|on|off]
    [sync-cache-mode immediate|flush]
    [temperature-exceeded enabled|disabled|on|off]
    [utility-priority low|medium|high]
    [spin-down enabled|disabled|on|off]
    [spin-down-delay delay]
    [single-controller]
```

Parameters

`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 vdisks are automatically checked for disk defects to ensure system health. Background disk scrub will start 72 hours after it is enabled. The interval between background disk scrub finishing and starting again is 72 hours.

- `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 vdisks are automatically checked for disk defects to ensure system health. The interval between background vdisk scrub finishing and starting again is specified by the `background-scrub-interval` parameter.

- `disabled` or `off`: Background vdisk scrub is disabled. This is the default.
- `enabled` or `on`: Background vdisk scrub is enabled.

`background-scrub-interval` *`interval`*
Optional. Sets the interval in hours between background vdisk scrub finishing and starting again, from 1–360 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. Sets whether the storage system will automatically designate an available compatible disk as a spare to replace a failed disk in a vdisk. A compatible disk has enough capacity to replace the failed disk and is the same type (SAS or SATA).

- `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 5–3600 seconds. The default is 5 seconds.

`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.

- `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. You cannot enable this parameter if the `single-controller` parameter is enabled.

`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. Sets whether host drivers may probe for LUNs until the host drivers reach the LUN to which they have access.

- `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.

- `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.

`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.

- `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.

`super-cap-failure enabled|disabled|on|off`
Optional. Sets whether the cache policy will change from write-back to write-through when the super-capacitor that provides backup power for cache is not fully charged or fails.

- `disabled` or `off`: The super-capacitor failure trigger is disabled.
- `enabled` or `on`: The super-capacitor 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 vdisk verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect vdisk 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.

`spin-down enabled|disabled|on|off`
Optional. Sets whether available disks and 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.

`spin-down-delay` *`delay`*
Optional. Sets the period of inactivity after which available disks and global spares will spin down. The default is 15 minutes. Setting the delay to 1–360 minutes will enable spin down; setting the delay to 0 will disable spin down.

`single-controller`
Optional; for use by a service technician only. 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 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.

Example Enable partner firmware upgrade:

```
# set advanced-settings partner-firmware-upgrade enabled
Success: Command completed successfully. - The settings were changed
successfully. (2012-01-20 11:57:01)
```

Enable managed logs:

```
# set advanced-settings managed-logs enabled
Success: Command completed successfully. - The settings were changed
successfully. (2012-01-21 16:25:58)
```

See also

- scrub vdisk
- set job-parameters
- set spares
- show advanced-settings

set auto-write-through-trigger

Description Sets the trigger conditions that cause the controller to change the cache policy from write-back to write-through. You can set multiple triggers. By default `super-cap-failure` and `auto-write-back` are enabled. Alias: `set awt`.

When the cache mode is changed, an event is logged.

Syntax

```
set auto-write-through-trigger
    [controller-failure enabled|disabled|on|off]
    [super-cap-failure enabled|disabled|on|off]
    [compact-flash-failure enabled|disabled|on|off]
    [power-supply-failure enabled|disabled|on|off]
    [fan-failure enabled|disabled|on|off]
    [temperature-exceeded enabled|disabled|on|off]
    [partner-notify enabled|disabled|on|off]
    [auto-write-back enabled|disabled|on|off]
```

Parameters

`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.

`super-cap-failure enabled|disabled|on|off`
Optional. Sets whether the cache policy will change from write-back to write-through when the super-capacitor that provides backup power for cache is not fully charged or fails.

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

`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.

`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.

`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.

`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.

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

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

`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.

Example Enable the controller-failure trigger and disable the partner-notification trigger:

```
# set auto-write-through-trigger controller-failure enabled partner-notify
disabled
Success: Command completed successfully. - Auto-write-through-trigger parameters
were changed. (2012-01-21 11:50:05)
```

See also
- show auto-write-through-trigger
- show events

set awt

See set auto-write-through-trigger.

set cache-parameters

Description Sets a volume's cache options.

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.

Syntax

```
set cache-parameters
    [write-policy write-back|write-through|wb|wt]
    [optimization standard|no-mirror]
    [read-ahead-size disabled|default|maximum|64KB|128KB|256KB|512KB|1MB|2MB|4MB
    |8MB|16MB|32MB]
    volume
```

Parameters

`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 default and preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput.
- `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 auto-write-through-trigger command.

`optimization standard|no-mirror`
Optional. Sets the cache optimization mode:

- `standard`: Optimizes cache for both sequential and random reads. This is the default.
- `no-mirror`
  When this mode is enabled, each controller stops mirroring its cache metadata to the partner controller. This improves write I/O response time but at the risk of losing data during a failover. ULP behavior is not affected, with the exception that during failover any write data in cache will be lost.

`read-ahead-size`
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 after two back-to-back reads are made. Read ahead is triggered by two back-to-back accesses to consecutive logical block address (LBA) ranges. Read ahead can be forward (that is, increasing LBAs) or reverse (that is, 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.

- `disable`: Turns off read-ahead cache.
- `default`: Sets one chunk for the first access in a sequential read and one stripe for all subsequent accesses. The controllers treat non-RAID and RAID-1 vdisks internally as if they have a stripe size of 64 Kbyte, even though they are not striped. This setting works well for most applications.
- `maximum`: Allows the controller to dynamically calculate the maximum read-ahead cache size for the volume.
- `64 KB`, `128 KB`, `256 KB`, `512 KB`, `1 MB`, `2 MB`, `4 MB`, `8 MB`, `16 MB`, or `32 MB`: Sets a specific cache size.

`volume`
Name or serial number of the volume to change. For volume syntax, see Command syntax on page 20.

Example Set the cache policy and cache optimization mode for volume `V1`:

```
# set cache-parameters optimization standard read-ahead-size maximum V1
Success: Command completed successfully. - Cache parameters were changed.
(2012-01-21 11:52:03)
```

See also
- show cache-parameters
- show volumes

set chap-record

Description For iSCSI, changes an 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.

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.

`mutual-name` *recipient-name*
Optional; for mutual CHAP only. The recipient name, typically in IQN format. The name 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 an iSCSI port Target ID value. 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. A storage system's secret is shared by both controllers. This parameter and `mutual-name` must be set together.

Example For mutual CHAP, add a recipient name and secret to a CHAP record:

```
# set chap-record name iqn.1991-05.com.microsoft:myhost.domain mutual-name
iqn.1995-03.com.acme:01.storage.00c0ffd6000a mutual-secret ABCdef123456
Success: Command completed successfully.
(iqn.1991-05.com.microsoft:myhost.domain) - The CHAP record was changed.
(2012-01-21 11:54:33)
```

See also

- create chap-record
- delete chap-records
- show chap-records
- show host-parameters
- show iscsi-parameters

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.

Syntax

```
set cli-parameters
    [base 2|10]
    [console|api|api-embed]
    [brief enabled|disabled|on|off]
    [locale English|en|Spanish|es|French|fr|German|de|Italian|it|Japanese|ja
    |Korean|ko|Dutch|nl|Chinese-simplified|zh-s|Chinese-traditional|zh-t]
    [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.
- `10`: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. This 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`
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.
- `ipa`: Alternate form of XML output for internal use only.
- `json`: Alternate data-interchange format for internal use only.

`brief enabled|disabled|on|off`
Optional.

- `enabled` or `on`: In XML output, shows a subset of attributes of object properties. The `name` and `type` attributes are always shown.
- `disabled` or `off`: In XML output, shows all attributes of object properties. This is the default.

`locale`
`English|en|Spanish|es|French|fr|German|de|Italian|it|Japanese|ja|Korean|ko|Dutch|nl|Chinese-simplified|zh-s|Chinese-traditional|zh-t`
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 XML 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.

Example Set CLI parameters:

```
# set cli-parameters timeout 600 precision 2 units GB temperature-scale f
Success: Command completed successfully. - The settings were changed
successfully. (2012-01-21 11:56:08)
```

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 CLI to show output in console format:

```
# set cli-parameters console
Success: Command completed successfully. - The settings were changed
successfully. (2012-01-21 11:56:17)
```

See also

- show cli-parameters

set controller-date

Description Sets the date and time parameters for the system. You can set the date and time manually or configure the system to communicate with a Network Time Protocol (NTP) server. Alternatively, you can configure NTP by using the set ntp-parameters command.

NOTE: If you specify valid NTP parameters and manual date/time parameters in the same command, the NTP parameters will take precedence. If the NTP server cannot be contacted, the date and time will not be changed and no error message will be displayed.If you specify the `timestamp` parameter and other manual date/time parameters in the same command, the `timestamp` parameter will take precedence.

Syntax To set the date and time manually:

```
set controller-date
   jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec
   day
   hh:mm:ss
   year
```

To set the date and time manually by specifying a timestamp:

```
set controller-date
   timestamp timestamp
   timezone +|-hh[:mm]
```

To configure use of NTP:

```
set controller-date
   ntp enabled|disabled|on|off
   ntpaddress IP-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.

`ntpaddress` *IP-address*
The network address of an available NTP server.

`timezone +|-`*hh*`[:`*mm*`]`
The system's time zone as an offset in hours (-1 to -12, +1 to +13) and minutes (0–59) from Coordinated Universal Time (UTC). For example, the Pacific Time Zone offset is -8 during Pacific Standard Time or -7 during Pacific Daylight Time.

`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.

Example Manually set the system time and date to 1:45 PM on September 22, 2011:

```
# set controller-date sep 22 13:45:0 2011
Success: Command completed successfully. - Date/Time successfully set.
(2011-11-02 13:45:03)
```

Manually set the system date and time to 4:30:50 PM on November 2, 2011 by specifying a timestamp and an offset for the Central Time zone:

```
# set controller-date timestamp 1320273050 timezone -6
Success: Command completed successfully. - Date/Time successfully set.
(2011-11-02 16:30:53)
```

Set the system to use NTP with an offset for the Mountain Time zone:

```
# set controller-date ntp enabled ntpaddress 69.10.36.3 timezone -7
Success: Command completed successfully. - Date/Time successfully set.
(2011-11-02 12:15:22)
```

Set the system to use NTP with an offset for the Bangalore, India, time zone:

```
# set controller-date ntp enabled ntpaddress 69.10.36.3 timezone +5:30
Success: Command completed successfully. - Date/Time successfully set.
(2011-11-02 23:00:02)
```

See also

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

set debug-log-parameters

Description **For use by or with direction from a service technician.**

Sets the types of debug messages to include in the Storage Controller debug log.

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:

- `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.
- `capi`: Internal Configuration API debug messages. Enabled by default.
- `capi2`: Internal Configuration API tracing debug messages. Disabled by default.
- `disk`: Disk interface debug messages. Enabled by default.
- `dms`: Snapshot feature debug messages. Enabled by default.
- `emp`: Enclosure Management Processor debug messages. Enabled by default.
- `fo`: Failover and recovery debug messages. Enabled by default.
- `fruid`: FRU ID debug messages. Enabled by default.
- `hb`: Not used.
- `host`: Host interface debug messages. Enabled by default.
- `init`: Not used.
- `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`: Not used.
- `raid`: RAID debug messages. Enabled by default.
- `rcm`: Removable-component manager debug messages. Disabled by default.
- `res2`: Internal debug messages. Disabled by default.
- `resmgr`: Reservation Manager debug messages. Disabled by default.

Example Include RAID and cache messages, exclude EMP messages, and leave other message types unchanged:

```
# set debug-log-parameters raid+ cache+ emp-
Success: Command completed successfully. - Debug-log parameters were changed.
(2012-01-21 11:58:38)
```

See also

- show debug-log-parameters

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.
- 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. To set spin-down parameters for a vdisk, use set vdisk.

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.

Syntax

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

Parameters

`smart enabled|disabled|on|off|detect-only`
Optional. Sets whether SMART is enabled or disabled for disks:

- `disabled` or `off`: Disables SMART for all disks in the system and for all disks added to the system.
- `enabled` or `on`: Enables SMART for all disks in the system and for all disks added to the system. This is the default.
- `detect-only`: Detects but does not change the SMART setting of each disk in the system, and for each new disk added to the system.

`spin-down enabled|disabled|on|off`
Optional. Sets whether available disks and 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.

`spin-down-delay` *`delay`*
Optional. Sets the period of inactivity after which available disks and global spares will spin down. The default is 15 minutes. Setting the delay to 1–360 minutes will enable spin down; setting the delay to 0 will disable spin down.

Example 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
Success: Command completed successfully. (2012-01-21 11:59:37)
```

See also

- show disk-parameters

set email-parameters

Description Sets SMTP notification parameters for events and managed logs.

Syntax

```
set email-parameters
   domain domain
   email-list email-addresses
   [include-logs enabled|disabled|on|off]
   notification-level crit|error|warn|info|none
   sender sender
   server server
```

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.

`email-list` *`email-addresses`*

Enter up to four comma-separated email addresses for recipients of event notifications. Each email address can have a maximum of 320 bytes. If the managed logs feature is enabled, the fourth email-address is used to specify the address of the log collection system. For example: `IT-team@MyDomain.com,,,LogCollector@MyDomain.com`

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

Optional. When the managed logs feature is enabled, this option activates the "push" mode, automatically attaching system log files to managed logs email notifications that are sent to the log collection system. This option is disabled by default.

`notification-level crit|error|warn|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.
- `info`: Sends notifications for all events.
- `none`: Disables email notification. If this option is specified, no other parameters are required and their current values are not changed.

`sender` *`sender`*

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. Because this name is used as part of an email address, do not include spaces. For example: `Storage-1`.

`server` *`server`*

The IP address of the SMTP mail server to use for the email messages.

Example Set the system to send an email from `RAIDsystem@mydomain.com` to both `sysadmin@mydomain.com` and `JSmith@domain2.com` when a non-Informational event occurs, and to send an email with attached logs to `logcollector@mydomain.com` when logs need to be transferred:

```
# set email-parameters server 10.1.1.10 sender RAIDsystem domain mydomain.com
notification-level warn include-logs enabled email-list
sysadmin@mydomain.com,JSmith@domain2.com,,logcollector@mydomain.com
Info: Set Email Address 1 to: sysadmin@mydomain.com (sysadmin@mydomain.com)
Info: Set Email Address 2 to: JSmith@domain2.com (sysadmin@mydomain.com)
Info: Set Email Address 3 to:
Info: Set Email Address 4 to: logcollector@mydomain.com
(logcollector@mydomain.com)
Info: Set Email Server Name to: 10.1.1.10 (10.1.1.10)
Info: Set Email Domain Name to: mydomain.com (mydomain.com)
Info: Set Email Notification Level to: warn (mydomain.com)
Info: Set Email Sender Name to: RAIDsystem (RAIDsystem)
Info: Set Email Include Logs: enabled (enabled)
Success: Command completed successfully. (2012-01-21 15:07:46)
```

See also

- show email-parameters
- test

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. A value that contains a space must be enclosed in double quotes.

These values are used when user interfaces show enclosure-related data; for example, in output of the show enclosures command and in event-log entries related to enclosures.

Syntax

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

Parameters

`name new-name`
A new name for the enclosure. The name can include a maximum of 20 bytes, using printable UTF-8 characters except double quote, left angle bracket, comma, or backslash. A value that contains a space must be enclosed in double quotes.

`location location`
The location of the enclosure. The name can include a maximum of 20 bytes, using characters except double quote, left angle bracket, comma, or backslash. A value that contains a space must be enclosed in double quotes.

`rack-number rack-number`
The number of the rack containing the enclosure, from 0–255.

`rack-position rack-position`
The enclosure's position in the rack, from 0–255.

`enclosure-number`
The enclosure ID.

Example Set parameters for enclosure 1:

```
# set enclosure 1 name Storage-5 location Lab rack-number 9 rack-position 3
Success: Command completed successfully. (2012-01-21 12:03:12)
```

See also

- show enclosures

set expander-fault-isolation

Description **For use by or with direction from a service technician.**

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.

Syntax

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

Parameters

`encl` *`enclosure-ID`*
The enclosure ID of the enclosure containing the PHY.

`controller a|b|both`
The I/O module containing the Expander Controller whose setting you want to change: A, B, or both.

`enabled|disabled|on|off`
Whether to enable or disable PHY fault isolation.

Example Disable PHY fault isolation for Expander Controller A in an enclosure:

```
# set expander-fault-isolation encl 0 controller a disabled
Success: Command completed successfully. - Expander fault isolation was
disabled. (2012-01-21 12:05:41)
```

Re-enable PHY fault isolation for Expander Controller A in the same enclosure:

```
# set expander-fault-isolation encl 0 controller a enabled
Success: Command completed successfully. - Expander fault isolation was enabled.
(2012-01-21 12:05:51)
```

See also

- set expander-phy
- show enclosures
- show expander-status

set expander-phy

Description **For use by or with direction from a service technician.**

Disables or enables a specific PHY.

Syntax

```
set expander-phy
   encl enclosure-ID
   controller a|b|both
   type drive|sc-0|sc-1|ingress|egress
   phy phy-ID
   enabled|disabled|on|off
```

Parameters

`encl` *`enclosure-ID`*
The enclosure ID of the enclosure containing the PHY.

`controller a|b|both`
The I/O module containing the PHY to enable or disable: A, B, or both.

`type drive|sc-0|sc-1|ingress|egress`
The PHY type:

- `drive`: PHY connected to a disk drive.
- `egress`: PHY in an egress port.
- `ingress`: PHY in an ingress port.
- `sc-0`: PHY in the ingress bus to the local Storage Controller.
- `sc-1`: PHY in the ingress bus to the partner Storage Controller.

`phy` *`phy-ID`*
The logical PHY number.

`enabled|disabled|on|off`
Whether to enable or disable the specified PHY.

Example Disable the first egress PHY in controller A, and check the resulting status:

```
# set expander-phy encl 0 controller a type egress phy 0 disabled
Success: Command completed successfully. - Disabled PHY 0 on controller a in
enclosure 0. (PHY type: egress) (2012-01-21 12:07:36)

# show expander-status
Encl  Ctlr  Phy  Type    Status           Elem Status  Disabled  Reason
--------------------------------------------------------------------------------
...
0     A     0    Egress  Disabled         Disabled     Disabled  PHY control
--------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-21 12:03:42)
```

Enable the PHY for disk 5 in controller B, and check the resulting status:

```
# set expander-phy encl 0 controller b type drive phy 5 enabled
Success: Command completed successfully. - Enabled PHY 5 on controller b in
enclosure 0. (PHY type: drive) (2012-01-21 12:07:50)

# show expander-status
Encl  Ctlr  Phy  Type    Status           Elem Status  Disabled  Reason
--------------------------------------------------------------------------------
...
0     B     5    Drive   Enabled-Healthy  OK           Enabled
--------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-21 12:03:42)
```

See also

- set expander-fault-isolation
- show enclosures
- show expander-status

set host-name

Description Changes the nickname of a host entry.

This command can also be used to remove a manually created host. If the host is unmapped it is immediately removed; if the host is mapped, it will be removed after you unmap it.

Syntax

```
set host-name
   id host
   [new-nickname]
```

Parameters

`id host`
The ID or nickname of the host.

new-nickname
Optional. Changes the host's nickname to the specified name. The name is case sensitive; cannot include a comma, double quote, left angle bracket, or backslash; and can have a maximum of 15 bytes. A name that includes a space must be enclosed in double quotes. If this parameter is omitted for a manually created host, the host will be removed.

Example Initially set the nickname for a discovered host:

```
# set host-name id 257000c0ffd74c07 Host1
Success: Command completed successfully. (2011-10-12 12:17:00)
```

Change `Host1`'s nickname to `MyHost`:

```
# set host-name id Host1 MyHost
Success: Command completed successfully. (2012-01-21 12:14:07)
```

Remove the nickname for a discovered host:

```
# set host-name id MyHost
Success: Command completed successfully. (2011-10-12 12:17:20)
```

Remove a manually created host:

```
# set host-name id MyHost
Success: Command completed successfully. (2012-01-21 12:19:16)
```

See also

- create host
- delete host
- show hosts

set host-parameters

Description Sets controller host-port parameters for communication with attached hosts. You can set parameters for FC and iSCSI ports; there are no parameters for SAS ports.

Attempting to change FC loop IDs requires restarting the controllers; otherwise, new settings take effect without restarting the controllers.

By default, iSCSI port speeds are auto-negotiated. To prevent them from acquiring inappropriately low speeds, use the set iscsi-parameters command.

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|y|n|expert]
    [speed 2g|4g|8g|auto]
```

To set iSCSI-port parameters:

```
set host-parameters
    [controller a|b|both]
    [gateway address]
    [ip address]
    [iscsi-ip-version ipv4|ipv6]
    [netmask address]
    [noprompt]
    [ports ports|all]
    [prompt yes|no|expert]
```

Parameters `controller a|b|both`
Deprecated; use the `ports` parameter.

`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).
- `point-to-point`: Fibre Channel point-to-point. To ensure maximum performance, this is the only option for 3XX3 models.
- `auto`: Loop preferred, otherwise point-to-point, based on the detected connection type. This is the default for 3XX0 models.

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.

`gateway address`
Optional. For iSCSI, the port gateway address.

`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.

`iscsi-ip-version ipv4|ipv6`
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.

`netmask address`
Optional. For iSCSI, the port netmask address.

`noprompt`
Optional in console format; required for XML API format. Suppresses the confirmation prompt, which requires a `yes` or `no` response. 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 on page 20.

`prompt yes|no|expert`
Optional. Specifies an automatic response to the confirmation prompt:

- `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 the prompt.

`speed 2g|4g|8g|auto`
Optional. For FC, sets a forced link speed in Gbit/sec 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.

Example On a system with FC ports, set the link speed to 8 Gbit/sec for ports A1 and B1:

```
# set host-parameters speed 8g ports a1,b1
WARNING: This change will take effect immediately. Changes may affect access to
data. Are you sure? yes
Success: Command completed successfully. - The host parameters were changed
successfully. (2012-01-21 15:42:52)
```

On a system with FC ports, set controller A ports to request loop ID 14 and controller B ports to use soft target addressing, and suppress the confirmation prompt:

```
# set host-parameters fibre-loop-id 14,soft noprompt
Info: Changes to FC loop IDs will not take effect until the affected Storage
Controller is rebooted.
Success: Command completed successfully. - The host parameters were changed
successfully. (2012-01-21 15:45:00)
```

On a system with FC ports, set the link speed to 4 Gbit/sec for ports A1 and B1; set controller A ports to request loop ID 5 and controller B ports to request loop ID 32; and suppress the confirmation prompt:

```
# set host-parameters speed 4g ports a1,b1 fibre-loop-id 5,32 noprompt
Info: Changes to FC loop IDs will not take effect until the affected Storage
Controller is rebooted.
Success: Command completed successfully. - The host parameters were changed
successfully. (2012-01-21 15:46:14)
```

On a system with iSCSI ports, for port A3 change the IP address:

```
# set host-parameters ip 10.134.50.6 port a3 iscsi-ip-version ipv4
WARNING: This change will take effect immediately. Changes may affect access to
data. Are you sure? yes
Success: Command completed successfully. - The host parameters were changed
successfully. (2012-01-21 15:46:51)
```

Specify that iSCSI ports will use IPv6 addressing:

```
# set host-parameters iscsi-ip-version ipv6
Success: Command completed successfully. - iSCSI parameter(s) were changed
successfully. (2012-01-21 15:47:30)
```

See also

- restart
- set iscsi-parameters
- show host-parameters

set iscsi-parameters

Description For iSCSI, changes system-wide iSCSI parameters.

Syntax

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

Parameters

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

`jumbo-frame enabled|disabled|on|off`
Enables or disables support for jumbo frames. Disabled by default. A normal frame can contain 1500 bytes whereas a jumbo frame can contain a maximum of 9000 bytes 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.

`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/sec, overriding a downshift that can occur during auto-negotiation with 1-Gbit/sec HBAs. This setting does not apply to 10-Gbit/sec HBAs.

`isns enabled|disabled|on|off`
Enables or disables registration with a specified Internet Storage Name Service server, which provides name-to-IP-address mapping. Disabled by default.

`isns-ip iSNS-IP`
Specifies the IP address of an iSNS server. The default address is all zeroes.

`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.

`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.

Example For a storage system 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
Success: Command completed successfully. - iSCSI parameter(s) were changed
successfully. (2012-01-21 12:21:15)
```

Specify that iSCSI ports will use IPv6 addressing:

```
# set iscsi-parameters iscsi-ip-version ipv6
Success: Command completed successfully. - iSCSI parameter(s) were changed
successfully. (2012-01-21 12:21:20)
```

See also
- set host-parameters
- show iscsi-parameters

set job-parameters

Description Sets parameters for background vdisk scrub, partner firmware upgrade, and other jobs.

Syntax

```
set job-parameters
    [background-scrub enabled|disabled|on|off]
    [partner-firmware-upgrade enabled|disabled|on|off]
    [utility-priority low|medium|high]
```

Parameters

`background-scrub enabled|disabled|on|off`
Optional. Sets whether disks in vdisks are automatically checked for disk defects to ensure system health. The interval between background vdisk scrub finishing and starting again is 24 hours.

`partner-firmware-upgrade enabled|disabled|on|off`
Optional. Sets whether component firmware versions are monitored and will be automatically updated on the partner controller.

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

`utility-priority low|medium|high`
Optional. Sets the priority at which data-redundancy utilities, such as vdisk verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect vdisk 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.

Example Enable background scrubbing of vdisks and disable partner firmware upgrade:

```
# set job-parameters background-scrub on partner-firmware-upgrade off
Info: Parameter 'background-scrub' was set to 'on'. (2012-01-21 12:22:14)
Info: Parameter 'partner-firmware-upgrade' was set to 'off'. (2012-01-21
12:22:14)
Success: Command completed successfully. - The settings were changed
successfully. (2012-01-21 12:22:14)
```

See also

- scrub vdisk
- set advanced-settings
- show job-parameters

set led

Description Changes the state of the identification LED on a specified disk or enclosure. For a disk this affects the fault LED. For an enclosure this affects the unit locator LED. LEDs are described in the Setup Guide.

Syntax To set a disk LED:

```
set led
   disk ID
   enable|disable|on|off
```

To set an enclosure LED:

```
set led
   enclosure ID
   enable|disable|on|off
```

Parameters `disk ID`
The disk to locate. For disk syntax, see Command syntax on page 20.

`enclosure ID`
The enclosure to locate.

`enable|disable|on|off`
Specifies to set or unset the LED.

Example Identify disk 5 in the first enclosure:

```
# set led disk 0.5 on
Success: Command completed successfully. - Enabling identification LED for disk
0.5... (2012-01-21 12:23:18)
```

Stop identifying the first enclosure:

```
# set led enclosure 0 off
Success: Disabling identification LED for enclosure 0... (2012-01-21 12:24:03)
```

set network-parameters

Description Sets parameters for controller module network ports.

You can manually set static IP values for each controller, or you can specify that IP values should be set automatically for both controllers through communication with a Dynamic Host Configuration Protocol (DHCP) server.

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.

You can also set link speed, auto-negotiation, and duplex-mode parameters to enable Ethernet switches to communicate with the storage system. These settings will persist if the Ethernet cable is disconnected and reconnected, but will revert to default values if the controller is removed from the enclosure. These settings affect only the network port of the controller on which this command is entered.

Syntax

```
set network-parameters
    [dhcp]
    [ip address]
    [netmask netmask]
    [gateway gateway]
    [controller a|b]
    [ping-broadcast enabled|disabled|on|off]
    [link-speed 10mbps|100mbps]
    [duplex-mode full|half]
    [auto-negotiation enabled|disabled|on|off]
    [prompt yes|no]
    [noprompt]
```

Parameters

`dhcp`
Optional. Specifies to use DHCP to set both controllers' IP values.

`ip` *`address`*
Optional. An IP address for the port.

`netmask` *`netmask`*
Optional. An IP subnet mask for the port.

`gateway` *`gateway`*
Optional. A gateway IP address for the port.

`controller a|b`
Optional. For IP-related parameters, this specifies whether to apply settings to controller A or B. If this parameter is omitted, settings are applied to the controller being accessed. This parameter does not apply to Ethernet switch-related parameters, whose settings are always applied to the controller being accessed.

`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.

`link-speed 10mbps|100mbps`
Optional. Specifies the maximum link speed for auto-negotiation.

- `10mbps`: Sets the link speed to 10 Mb/s.
- `100mbps`: Sets the link speed to 100 Mb/s. If this parameter is omitted and a port's link speed is not set, it will be set to 100 Mb/s.

`duplex-mode full|half`
Optional. Specifies the duplex mode.

- `full`: Sets the port to use full duplex. If this parameter is omitted and a port's duplex mode is not set, it will be set to full duplex.
- `half`: Sets the port to use half duplex.

`auto-negotiation enabled|disabled|on|off`
Optional. Specifies whether to auto-negotiate the link speed.

- `enabled` or `on`: Enables auto-negotiation. If you enable auto-negotiation you must also specify the `link-speed` parameter to set the maximum supported speed for auto-negotiation. Because the controller will choose the proper duplex mode for the negotiated speed, you cannot specify the `duplex-mode` parameter.
- `disabled` or `off`: Disables auto-negotiation. If you disable auto-negotiation and don't specify the `link-speed` and `duplex-mode` parameters, the controller will use the current settings of the network port.

If this command is specified and the `auto-negotiation` parameter is omitted, auto-negotiation will be enabled.

`prompt yes|no`
Optional. For scripting, this specifies an automatic response to the confirmation prompt that appears when an Ethernet switch parameter is changed:

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

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

`noprompt`
Optional in console format; required for XML API format. Suppresses the confirmation prompt that appears when an Ethernet switch parameter is changed, which requires a yes or no response. Specifying this parameter allows the command to proceed without user interaction.

Example Use DHCP to set network port IP values:

```
# set network-parameters dhcp
Success: Command completed successfully. - Request to set network parameters has
been initiated. (2011-10-12 12:26:45)
```

Manually set network port IP values for controller A (disabling DHCP for both controllers, if it was enabled):

```
# set network-parameters ip 192.168.0.10 netmask 255.255.255.0 gateway
192.168.0.1 controller a
Success: Command completed successfully. - Request to set network parameters has
been initiated. (2012-01-21 12:26:50)
```

For the controller you are accessing, set the network port to auto-negotiate with a maximum link speed of 100 Mb/s:

```
# set network-parameters auto-negotiation on link-speed 100mbps
WARNING: You are attempting to change the Ethernet settings for this Management
Controller, which will affect the link speed and duplex mode settings. Are you
sure? yes
Success: Command completed successfully. - Request to set network parameters has
been initiated. (2012-10-18 15:38:10)
```

For the controller you are accessing, for which auto-negotiation is disabled, set the network port to use a maximum link speed of 10 Mb/s and half-duplex mode:

```
# set network-parameters link-speed 10mbps duplex-mode half
WARNING: You are attempting to change the Ethernet settings for this Management
Controller, which will affect the link speed and duplex mode settings. Are you
sure? yes
Success: Command completed successfully. - Request to set network parameters has
been initiated. (2012-10-18 15:38:35)
```

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.

Syntax

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

Parameters

`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.

`ntpaddress` *`IP-address`*
The network address of an available NTP server.

`timezone +|-`*`hh`*`[:`*`mm`*`]`
The system's time zone as an offset in hours (-1 to -12, +1 to +13) and minutes (0–59) from Coordinated Universal Time (UTC). For example, the Pacific Time Zone offset is -8 during Pacific Standard Time or -7 during Pacific Daylight Time.

Example 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
Success: Command completed successfully. - Date/Time successfully set.
(2011-10-11 14:52:19)
```

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
Success: Command completed successfully. - Date/Time successfully set.
(2011-10-11 14:52:29)
```

See also

- set controller-date
- show controller-date
- show ntp-status

set password

Description Sets a user's 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.

Syntax

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

Parameters

`password` *password*
Optional. Sets a new password for the user. 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. For user password rules, type `help syntax`.

user
Optional. The user name to set the password for. If this parameter is omitted, this command affects the logged-in user's password.

Example Change the password for the default user, `manage`:

```
# set password manage
Enter new password: ********
Re-enter new password: ********
Success: Command completed successfully. (manage) - The password was changed.
(2011-10-11 14:48:03)
```

Change the password for user `JDoe`:

```
# set password JDoe password Abcd%1234
Success: Command completed successfully. (JDoe) - The password was changed.
(2011-10-11 14:48:12)
```

See also

- show users

set priorities

Description Sets snapshot-retention priorities for a specified snap pool. Snap-pool priorities, in conjunction with snapshot priorities, determine which snapshots are retained if system resource limitations require some snapshots to be automatically deleted.

Lower-priority snapshots will be deleted before higher-priority snapshots. Priority values are 1–65535. To use a default priority, specify the value `0`.

Syntax

```
set priorities
    [standard-snap #]
    [volume-copy #]
    [replication-snap #]
    [replicating #]
    [common-sync-point #]
    [only-sync-point #]
    [queued #]
    snap-pool
```

Parameters

`standard-snap #`
Optional. Retention priority for a standard snapshot. The default is 0x6000 (24576).

`volume-copy #`
Optional. Retention priority for a snapshot that is being used to copy data from a source volume to a destination volume. This attribute is temporary for the duration of the volume-copy process. The default is 0xa000 (40960).

`replication-snap #`
Optional. Retention priority for a replication snapshot. The default is 0x4000 (16384).

`replicating #`
Optional. Retention priority for a snapshot that is being replicated to a secondary volume. This snapshot is required in order to resume the replication. The attribute is temporary for the duration of the replication process. The default is 0xc000 (49152).

`common-sync-point #`
Optional. Retention priority for the latest snapshot that is copy complete on all secondary volumes. It identifies a common point in time that is known by all destinations. The default is 0x8000 (32768).

`only-sync-point #`
Optional. Retention priority for the only sync point that is available on at least one secondary volume. If this snapshot is removed, then the next replication requires a full sync to be performed. The default is 0xe000 (57344).

`queued #`
Optional. Retention priority for a snapshot that was taken for remote replication but is queued waiting for the previous replications to complete. The default is 0x2000 (8192).

`snap-pool`
Name or serial number of the snap pool.

Example Set attribute priorities for snap pool `SP1`, raising the priority for standard snapshots and leaving other priorities unchanged:

```
# set priorities only-sync-point 65535 SP1
Success: Command completed successfully. - The priorities were successfully set.
(2012-01-21 12:28:24)
```

See also

- show priorities
- show snap-pools

set prompt

Description Sets the prompt for the current CLI session.

Syntax `set prompt` *`prompt`*

Parameters *`prompt`*
The new prompt, which can include any printable UTF-8 characters except left angle bracket, backslash, and double quote, and can have a maximum of 16 bytes. A prompt that includes a space must be enclosed in double quotes.

Example Change the prompt from "`# `" to "`CLI$ `" and start entering another command:

```
# set prompt "CLI$ "
Success: Command completed successfully. (2012-08-14 14:47:23)
CLI$ show ...
```

set protocols

Description Enables or disables management services and protocols.

Syntax

```
set protocols
    [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]
    [smis enabled|disabled|on|off]
    [snmp enabled|disabled|on|off]
    [ssh enabled|disabled|on|off]
    [telnet enabled|disabled|on|off]
    [usmis enabled|disabled|on|off]
```

Parameters

`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.

`ftp enabled|disabled|on|off`
Optional. Enables or disables the expert interface for updating firmware. This is enabled by default.

`http enabled|disabled|on|off`
Optional. Enables or disables the standard RAIDar web server. This is enabled by default.

`https enabled|disabled|on|off`
Optional. Enables or disables the secure RAIDar web server. This is enabled by default.

`ses enabled|disabled|on|off`
Optional. Enables or disables the in-band SCSI Enclosure Management Services interface. This is enabled by default.

`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 enabled by default.

`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.

`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.

Example Disable unsecure HTTP connections and enable FTP:

```
# set protocols http disabled ftp enabled
Success: Command completed successfully. (2012-01-21 14:46:55)
```

See also

- show protocols

set remote-system

Description Changes remote-system credentials stored on the local system. Do this when the user name or password to access a remote system has been changed on that system

Syntax

```
set remote-system
    [password password]
    [username username]
    system
```

Parameters

`password` *password*
Optional. New password to access the remote system. The value is displayed in clear text.

`username` *username*
Optional. New user name to access the remote system.

`system`
Name or network-port IP address of the remote system.

Example Change the password that is stored to access a remote system:

```
# set remote-system password Abc_123 System2
Info: The password was set. (System2) (2012-01-21 14:45:22)

Success: Command completed successfully. (System2) - The remote system was set.
(2012-01-21 14:45:22)
```

See also

- create remote-system
- delete remote-system
- remote
- show remote-systems

set replication-primary-volume

Description Changes the primary volume for a replication set. You must issue this command to each volume in the replication set. If the volumes in a replication set have different primary-volume settings — for example, if the primary volume was changed while one volume was offline — this results in a primary-volume conflict. Change the primary volume on the secondary system, then, if possible, change the primary volume on the primary system.

As part of this command, you can initiate a rollback to a specified snapshot to synchronize the new primary volume with a known data image.

When the secondary volume becomes the primary volume, it only retains the replication images that the primary volume had and deletes any images that the primary volume did not have. Because the secondary volume may not have successfully replicated all the images associated with the primary volume, the secondary volume might have a subset of the primary volume's images.

Syntax

```
set replication-primary-volume
   [nowait]
   primary-volume replication-volume
   [set replication-set]
   [snapshot snapshot]
   volume replication-volume
```

Parameters

`nowait`
Optional. Changing the primary volume can take the Storage Controller several minutes to complete. This parameter allows that processing to continue in the background so the Management Controller can process other commands.

`primary-volume` *`replication-volume`*
Name or serial number of the replication volume to designate as the new primary volume for the replication set. If the name is not unique, you must specify the serial number.

`set` *`replication-set`*
Optional. Name or serial number of the replication set.

`snapshot` *`snapshot`*
Optional. Name or serial number of a snapshot to roll the replication volume data back to.

`volume` *`replication-volume`*
Name or serial number of a volume in the replication set whose primary volume you want to change. If one of the volumes in the replication set is offline, this must specify the volume that remains online. If the name is not unique across replication sets, specify the `set` parameter.

Example For this example, assume that:

- Replication set `RS` has the primary volume `Data` and the secondary volume `rData`.
- Primary volume `Data` resides in the primary system, `System1`.
- Secondary volume `rData` resides in the secondary system, `System2`.

On `System1`, view the status of replication set `RS`:

```
# show replication-sets RS
Replication Set [Name (RS) Serial Number (<SN>) ] Primary Volume:
   Name  ...  Status ... Location Primary-Volume ... Primary-Volume-Status
   ------------------------------------------------------------------------
   Data  ...  Online ... Local    Data           ... Online
   rData ...  Online ... Remote   Data           ... Online
```

On System1, unmap the primary volume from hosts.

On System2, set secondary volume rData to be the primary volume:

```
# set replication-primary-volume volume rData primary-volume rData
Info: Started setting the primary volume of the replication set. (RS)
Info: Setting the primary volume of the replication set. This may take a
couple of minutes... (RS)
Info: Successfully set primary volume:  (rData)
Info: The primary volume of the replication set was changed. (RS)
Success: Command completed successfully. (2012-13-23 11:48:30)
```

On System2, view the set's status and notice that the primary volume has changed and that a primary-volume conflict exists:

```
# show replication-sets RS
Replication Set [Name (RS) Serial Number (<SN>) ] Primary Volume:
   Name  ...  Status ... Location Primary-Volume ... Primary-Volume-Status
   ------------------------------------------------------------------------
   Data  ...  Online ... Remote   Data           ... Conflict
   rData ...  Online ... Local    rData          ... Conflict
```

On System1, view the set's status and notice that it does not reflect the primary-volume change, thereby causing the conflict:

```
# show replication-sets RS
Replication Set [Name (RS) Serial Number (<SN>) ] Primary Volume:
   Name  ...  Status ... Location Primary-Volume ... Primary-Volume-Status
   ------------------------------------------------------------------------
   Data  ...  Online ... Local    Data           ... Conflict
   rData ...  Online ... Remote   Data           ... Conflict
```

On System1, as already done on System2, set rData to be the primary volume:

```
# set replication-primary-volume volume Data primary-volume rData
Info: Started setting the primary volume of the replication set. (RS)
Info: Setting the primary volume of the replication set. This may take a
couple of minutes... (RS)
Info: Successfully set primary volume:  (rData)
Info: The primary volume of the replication set was changed. (RS)
Success: Command completed successfully. (2012-13-23 11:55:50)
```

On System1 (the new secondary system), view the set's status and notice that the system is set to use the new primary volume and the conflict is resolved:

```
# show replication-sets RS
Replication Set [Name (RS) Serial Number (<SN>) ] Primary Volume:
   Name  ...  Status ... Location Primary-Volume ... Primary-Volume-Status
   ------------------------------------------------------------------------
   Data  ...  Online ... Local    rData          ... Online
   rData ...  Online ... Remote   rData          ... Online
```

Wait a couple of minutes for processing to complete. Then, on System2 (the new primary system), view the set's status and notice that the system is set to use the new primary volume and that the conflict is resolved:

```
# show replication-sets
Replication Set [Name (RS) Serial Number (<SN>) ] Primary Volume:
   Name  ...  Status ... Location Primary-Volume ... Primary-Volume-Status
   ------------------------------------------------------------------------
   Data  ...  Online ... Local    rData          ... Online
   rData ...  Online ... Remote   rData          ... Online
```

Map the new primary volume to hosts.

See also

- show replication-sets
- show replication-volumes
- show snapshots
- unmap volume

set replication-volume-parameters

Description Sets parameters for a specified replication volume. This command must be run separately on each system where the volume resides; changes to these parameters are not automatically synchronized across systems.

Syntax

```
set replication-volume-parameters
   [link-type FC|iSCSI]
   [max-queue #]
   [max-retry-time #]
   [monitor-interval #]
   [on-collision newest|oldest]
   [on-error retry|suspend]
   [priority low|medium|high]
   [remote-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs]
   [set replication-set]
   replication-volume
```

Parameters

`link-type FC|iSCSI`
Optional. Specifies the type of ports being used for the inter-system link:

- `FC`: FC ports.
- `iSCSI`: iSCSI ports.

`max-queue #`
Optional. Number of replication images to consider when determining the next image to replicate: 1–64. Used only if the `on-collision` parameter is set to `oldest`.

`max-retry-time #`
Optional; valid only if the `on-error` parameter is set to `retry`. Maximum time in seconds to retry a single replication if an error occurs. Allowed values are 0–64000; the default is 1800 (30 minutes). A value of 0 means do not time out retries; that is, retry forever. By default, a retry will occur 5 minutes after an error occurs. If another error occurs and the difference in time between when the error occurs and the initial retry time is greater than the `max-retry-time` value, the replication will be suspended.

In order to prevent a replication set from suspending when multiple independent, discontinuous errors occur during a single replication, set `max-retry-time` for the secondary volume either to 0 (retry forever) or to 60 minutes for each 10GB of volume size.

`monitor-interval #`
Optional. Interval in seconds at which the primary volume should query the secondary volume. Values less than 300 (5 minutes) or greater than 1800 (30 minutes) are not allowed.

`on-collision newest|oldest`
Optional. Collision policy to use when the image queue depth is met:

- `newest`: Only the latest replication image should be considered for the next replication operation.
- `oldest`: Only the latest *N* replication images should be considered for the next replication operation, where *N* is defined by the `max-queue` parameter and the oldest of these images should be considered first.

`on-error retry|suspend`
Optional. Error policy to use when errors occur during the replication process:

- `retry`: Retry the operation for the time specified in the `max-retry-time` parameter.
- `suspend`: Suspend the replication operation.

`priority low|medium|high`
Optional. Priority of the replication process on the replication volume: low, medium, or high.

`remote-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs`
Optional. Remote addresses associated with the replication volume. Specifies host ports on the remote system by IP address, World Wide Node Name, or World Wide Port Name. An IP address value can include a port number; for example, `10.134.11.10:3260`. Multiple values must be separated by commas and no spaces; for example: `ip=10.134.2.1,10.134.2.2`.

`set replication-set`
Optional. Name or serial number of the replication set.

`replication-volume`
Name or serial number of the replication volume. If the name is not unique within the replication set, the local volume is assumed. If the name is not unique across replication sets, specify the set parameter.

Example Set a new remote address and error policy for replication volume `MV2` in replication set `RS1`:

```
# set replication-volume-parameters remote-address ip=10.1.66.55 on-error
suspend set RS1 MV2
Success: Command completed successfully. (2012-01-21 16:10:04)
```

See also
- show replication-sets
- show replication-volumes

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.

When scheduling `ReplicateVolume` tasks, a best practice is to schedule no more than three volumes to start replicating at the same time, and for those replications to recur no less than 60 minutes apart. If you schedule more replications to start at the same time, or schedule replications to start more frequently, some scheduled replications may not have time to complete.

Syntax

```
set 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 `ReplicateVolume` 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 weekday|weekendday|Sunday|Monday|Tuesday|Wednesday|Thursday|Friday |Saturday of year|month|January|February|March|April|May|June|July |August|September|October |November|December]`
  Constrains the days or months when the task is permitted to run. Ensure that this constraint includes the start date.
- `[count #]`
  Constrains the number of times the task is permitted to run.
- `[expires yyyy-mm-dd hh:mm [AM|PM]]`
  Specifies when the schedule expires, after which the task will no longer run.

`task-name task-name`
The task to run. The name is case sensitive.

`schedule-name`
Name of the schedule to change.

Example Change parameters, including the associated task, for schedule `Sched1`:

```
# set schedule schedule-specification "start 2011-01-01 00:01 every 1 days
expires 2011-12-31 00:01" task-name Snap Sched1
Success: Command completed successfully. (Sched1) - The schedule was modified.
(2011-10-14 08:28:50)
```

See also

- show schedule-details
- show schedules
- show task-details
- show tasks

set snap-pool-policy

Description Sets the recovery policy that determines the action taken when a specified snap pool's error and critical threshold levels are reached. The policy for the warning threshold is preset to `notifyonly`. A snap pool's default error policy is `autoexpand` and default critical policy is `deletesnapshots`.

NOTE: The policies `deleteoldestsnapshot` and `deletesnapshots` do not apply business logic to the delete decision and may delete snapshots that are mounted/presented/mapped or modified. You may set retention priorities for a snap pool as a way of suggesting that some snapshots are more important than others, but these priorities do not ensure any specific snapshot is protected.

Syntax

```
set snap-pool-policy
    [error autoexpand|deleteoldestsnapshot|deletesnapshots|haltwrites
    |notifyonly]
    [critical deleteoldestsnapshot|deletesnapshots|haltwrites]
    [autoexpansionsize size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]]
    snap-pool
```

Parameters

`error autoexpand|deleteoldestsnapshot|deletesnapshots|haltwrites|notifyonly`
Optional. The policy to invoke when the error threshold level of snap-pool usage is reached.

- `autoexpand`: Automatically expand the snap pool using the `autoexpansionsize` value. If the snap pool's space usage reaches the percentage specified by its error threshold, the system will log Warning event 230 and will try to automatically expand the snap pool by the snap pool's `autoexpansionsize` value (below).
  - If the snap pool is successfully expanded, the system will log Informational event 444.
  - If the snap pool cannot be expanded because there is not enough available space in its vdisk, the system will log Warning event 444 and will automatically delete the oldest snapshot that is not a current sync point.

  Each time the snap-pool's error threshold is reached and the system cannot auto-expand the vdisk, the oldest remaining snapshot (that is not a current sync point) will be deleted. This behavior occurs for each snap pool independently, based on its space usage.
- `deleteoldestsnapshot`: Delete the oldest snapshot.
- `deletesnapshots`: Delete all snapshots.
- `haltwrites`: Halt writes to all master volumes and snapshots associated with the snap pool.
- `notifyonly`: Generates an event to notify the administrator.

`critical deleteoldestsnapshot|deletesnapshots|haltwrites`
Optional. Specifies the policy to invoke when the critical threshold level of snap-pool usage is reached.

`autoexpansionsize size[B|KB|MB|GB|TB|KiB|MiB|GiB|TiB]`
The amount by which the snap pool will be automatically expanded when the threshold level is reached. The value uses the current base, as shown by the show cli-parameters command. The unit can be specified as follows:

- If base 2 is in use: `B` (bytes), `KiB` (kibibytes), `MiB` (mebibytes), or `GiB` (gibibytes).
- If base 10 is in use: `B` (bytes), `KB` (kilobytes), `MB` (megabytes), or `GB` (gigabytes).

If no unit is specified, the unit is 512-byte blocks.

snap-pool
Name or serial number of the snap pool to set the policy for. For volume syntax, see Command syntax on page 20.

Example Set snap pool SP1 to automatically expand by 10 GB when its error threshold is reached:

```
# set snap-pool-policy error autoexpand autoexpansionsize 10GB SP1
Success: Command completed successfully. (2012-01-21 12:32:28)
```

See also

- set priorities
- set snap-pool-threshold
- show snap-pools

set snap-pool-threshold

Description Sets the percentages of snap-pool space used that trigger the warning and error threshold policies. Three thresholds are defined:

- Warning: The snap pool is moderately full. When this threshold is reached, an event is generated to alert the administrator.
- Error: The snap pool is nearly full and unless corrective action is taken, snapshot data loss is probable. When this threshold is reached, an event is generated to alert the administrator and the associated snap-pool policy is triggered.
- Critical: The snap pool is 98% full and data loss is imminent. When this threshold is reached, an event is generated to alert the administrator and the associated snap-pool policy is triggered.

Syntax

```
set snap-pool-threshold
    [warning #%]
    [error #%]
    snap-pool
```

Parameters

`warning #%`
The percent of snap-pool space used that triggers the warning threshold policy. This value must be less than the error threshold value. The default is 75%.

`error #%`
The percent of snap-pool space used that triggers the error threshold policy. This value must be less than 98%. The default is 90%.

`snap-pool`
Name or serial number of the snap pool to set the threshold for. For volume syntax, see Command syntax on page 20.

Example Set the warning and error thresholds for snap pool `SP1`:

```
# set snap-pool-threshold warning 60% error 85% SP1
Success: Command completed successfully. (2012-01-21 12:33:46)
```

See also

- set snap-pool-policy
- show snap-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.

Syntax

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

Parameters

`enable crit|error|warn|info|none`
Optional. Sets the level of trap notification:

- `crit`: Sends notifications for Critical events only.
- `error`: Sends notifications for Error and Critical events.
- `warn`: Sends notifications for Warning, Error, and Critical events.
- `info`: Sends notifications for all events.
- `none`: All events are excluded from trap notification and traps are disabled.

`add-trap-host address`
Optional. Specifies the IP address of a destination host that will receive traps. Three trap hosts can be set.

`del-trap-host address`
Optional. Deletes a trap destination host.

`trap-host-list trap-host-list`
Optional. Replaces the current list.

`read-community string`
Optional. Sets a community string for read-only access. This value is also included in traps that are sent. The value is case sensitive; can include any character except left angle bracket, single quote, and double quote; and can have a maximum of 31 bytes.

`write-community string`
Optional. Sets a community string for write access. The value is case sensitive; can include any character except left angle bracket, single quote, and double quote; and can have a maximum of 31 bytes.

Example 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
Success: Command completed successfully. - SNMP parameters were
changed.(2011-10-11 14:43:26)
```

See also

- set protocols
- show snmp-parameters
- test

set spares

Description Creates or deletes spare disks for redundant (RAID 1, 3, 5, 6, 10, 50) vdisks.

A global spare is available to any redundant vdisk with the same disk type. The system can have eight global spares. Each must have enough capacity to replace the smallest disk in any existing vdisk.

A dedicated spare is assigned to a redundant vdisk with the same disk type. A vdisk can have four spares. Each must have enough capacity to replace the smallest disk in that vdisk.

△ **CAUTION:** When setting global spares, the existing set of global spares is completely replaced by the newly specified set of disks. When setting dedicated spares, the existing set of dedicated spares for the specified vdisk is completely replaced by the newly specified set of disks. So, for example, if you want to add new global spares to the ones that already exist, you must specify all the existing global spare disks as well as the new disks that you want to add.

Syntax

```
set spares
   disks disks|none
   [vdisk vdisk]
```

Parameters

`disks` *disks*|none
IDs of the disks to designate as spares, or `none` to delete all global spares if no vdisk is specified or all dedicated spares for a specified vdisk. For disk syntax, see Command syntax on page 20.

`vdisk` *vdisk*
Optional. Name or serial number of the vdisk to assign spares to. For vdisk syntax, see Command syntax on page 20. If this parameter is omitted, the disks will be global spares.

Example Designate disk 1.2 as a global spare:

```
# set spares disks 1.2
Info: Global spare disk 1.2 was added.
Success: Command completed successfully. (2012-01-20 15:00:36)
```

Designate disk 1.3 as a dedicated spare for vdisk `VD1`:

```
# set spares disks 1.3 vdisk VD1
Info: Vdisk spare disk 1.3 was added. (1.3)
Success: Command completed successfully. (2012-01-20 10:12:01)
```

Try to designate a disk of one type as a spare for a vdisk using a different disk type:

```
# set spares disk 2.1 vdisk VD1
Error: The specified spare cannot be used. - Disk 2.1 is not the same type as the
ones currently used by the vdisks. (2.1)
Error: Command failed. (2011-10-12 10:09:30)
```

Delete all global spares:

```
# set spares disks none
Info: Global spare disk 1.2 was deleted. (1.2)
Success: Command completed successfully. (2011-10-11 15:01:57)
```

Delete all dedicated spares for vdisk VD1:

```
# set spares disks none vdisk VD1
Info: Vdisk spare disk 1.3 was deleted. (1.3)
Success: Command completed successfully. (2011-10-12 10:12:54)
```

See also

- delete global-spare
- delete vdisk-spare
- set advanced-settings
- show disks
- show vdisks

set system

Description Sets the system's name, contact person, location, and description. Each value can include a maximum of 79 bytes, using printable UTF-8 characters except left angle bracket, backslash, or double quote. A value that contains a space must be enclosed in double quotes.

The name, location, and contact are included in event notifications. All four values are included in system debug logs for reference by service personnel. When using the WBI, the system name appears in the browser title bar or tab.

Syntax

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

Parameters

`name value`
A name to identify the system.

`contact value`
The name of the person who administers the system.

`location value`
The location of the system.

`info value`
A brief description of what the system is used for or how it's configured.

Example Set the system name to `Test` and the contact to `J. Doe`:

```
# set system name Test contact "J. Doe"
Success: Command completed successfully. (2012-01-21 14:42:12)
```

See also

- show system

set task

Description Changes parameters for a `TakeSnapshot`, `ReplicateVolume`, 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.

Syntax

```
set task
    [snapshot-prefix prefix]
    [retention-count #]
    [dest-vdisk vdisk]
    [dest-prefix prefix]
    [modified-snapshot yes|no]
    [replication-mode new-snapshot|last-snapshot]
    name
```

Parameters

`snapshot-prefix` *`prefix`*
Optional. A label to identify snapshots created by this task. Snapshot names have the format *`prefix`*`_s#`, where `#` starts at `001`.

`retention-count #`
Optional. For a `TakeSnapshot` task, the number of snapshots created by this task to retain, from 1 to the licensed limit. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted. If you reduce a task's retention count, excess snapshots will be removed the next time the task runs.

For a `ReplicateVolume` task, the number of replication images created by this task to retain, from 2 to 32. When a new image exceeds this limit, the oldest image with the same prefix is deleted. This parameter applies to the primary volume only; for the secondary volume, images will accumulate until either the secondary vdisk's space limit is reached or the maximum number of images is reached, after which the oldest image will be deleted as new images are created.

`dest-vdisk` *`vdisk`*
Optional. Name or serial number of the destination vdisk for the volume copy. For vdisk syntax, see Command syntax on page 20.

`dest-prefix` *`prefix`*
Optional. A label to identify the volume copy created by this task. Copy names have the format *`prefix`*`_c#`, where `#` starts at `001`.

`modified-snapshot yes|no`
Optional. For a `VolumeCopy` task, specifies whether to include or exclude modified write data from the snapshot in the copy. This parameter applies only when the source volume is a snapshot; it is ignored if the source volume is a master volume.

- `yes`: Include modified snapshot data.
- `no`: Exclude modified snapshot data.

If this parameter is omitted for a snapshot, modified snapshot data is excluded.

`replication-mode new-snapshot|last-snapshot`
Optional. Specifies whether to replicate a new snapshot of the volume to the remote system, or to replicate the last (most recent existing) snapshot of the volume to the remote system.

- `new-snapshot`: Replicate a new snapshot.
- `last-snapshot`: Replicate the most recent existing snapshot.

If this parameter is omitted, a new snapshot is replicated.

`name`
Name of the task to change.

Example Change parameters for a TakeSnapshot-type task named `Snap`:

```
# set task snapshot-prefix VD1v1 retention-count 2 Snap
Success: Command completed successfully. (Snap) - The task was
modified.(2012-01-21 12:37:49)
```

Change parameters for a VolumeCopy-type task named `Copy`:

```
# set task dest-vdisk VD3 dest-prefix VD1v1 modified-snapshot no Copy
Success: Command completed successfully. (Copy) - The task was
modified.(2012-01-21 12:37:52)
```

Change parameters for a ReplicateVolume-type task named `Replicate`:

```
# set task snapshot-prefix VD1v2 replication-mode last-snapshot Replicate
Success: Command completed successfully. (Replicate) - The task was
modified.(2012-01-21 12:37:57)
```

See also

- create task
- delete task
- set schedule
- show schedule-details
- show schedules
- show task-details
- 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.

NOTE: User changes take effect when the user next logs in.

Syntax

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

Parameters

`authentication-type MD5|SHA|none`
Optional. For an SNMPv3 user, this specifies whether to use a security authentication protocol. This parameter requires the password parameter and, for the `snmptarget` interface, the `trap-host` parameter.

- `MD5`: MD5 authentication. This is the default.
- `SHA`: SHA (Secure Hash Algorithm) 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.
- `10`: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. This 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. The defaults are `cli` and `wbi`.

- `cli`: Command-line interface.
- `wbi`: Web-browser interface (RAIDar).
- `ftp`: File transfer protocol 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.

`level monitor|manage`
Optional.

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

`locale English|en|Spanish|es|French|fr|German|de|Italian|it|Japanese|ja|Korean|ko|Dutch|nl|Chinese-simplified|zh-s|Chinese-traditional|zh-t`
Optional. The display language. The default is English.

`password` *`password`*
Optional in console format; required for XML API format. Sets a new password for the user. For an SNMPv3 user whose `authentication-type` parameter is set to use authentication, this specifies the authentication password. For user password rules, type `help syntax`.

`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. For user password rules, type `help syntax`.

`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.

`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` *`IP-address`*
Optional. For an SNMPv3 user whose `interface` parameter is set to `snmptarget`, this specifies the IP address of the host that will receive SNMP traps.

`type novice|standard|advanced|diagnostic`
Optional. Identifies the user's experience level. 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. Names are case sensitive.

Example Change the temperature scale and accessible interfaces for user `jsmith`:

```
# set user jsmith temperature-scale f interfaces wbi,cli
Success: Command completed successfully. - The settings were changed
successfully. (2012-01-21 14:39:50)
```

Change the password for user `JDoe`:

```
# set user JDoe password Abcd%1234
Success: Command completed successfully. - The settings were changed
successfully. (2012-01-21 14:39:56)
```

Change the authentication type for SNMPv3 user `Traps`:

```
# set user Traps authentication-type MD5 password Snmp%Trap
Success: Command completed successfully. - The settings were changed
successfully. (2012-01-12 14:40:10)
```

For the only CLI user with the `manage` role, try to reduce the role to monitor:

```
# set user SysAdmin roles monitor
Error: At least one CLI user must retain configuration privileges at all times.
(2013-10-31 14:10:47)
```

See also

- set password
- show users

set vdisk

Description Changes parameters for a specified vdisk.

Syntax

```
set vdisk
    [name new-name]
    [owner a|b]
    [spin-down-delay delay]
    vdisk
```

Parameters

`name new-name`
Optional. A new name for the vdisk. For vdisk syntax, see Command syntax on page 20.

`owner a|b`
Optional. The new owner: controller A or B.

△ **CAUTION:** Before changing the owning controller for a vdisk, you must stop host I/O to the vdisk's volumes. Volume mappings are not affected.

`spin-down-delay delay`
Optional. Sets the period of inactivity after which the vdisk's disks and dedicated spares automatically spin down, from 1–360 minutes. 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.

---

vdisk
Name or serial number of the vdisk to change. For vdisk syntax, see Command syntax on page 20.

Example Rename vdisk `VD1`, change its owner to controller A, and set its spin-down delay to 10 minutes:

```
# set vdisk name VD2 owner a spin-down-delay 10 VD1
Success: Command completed successfully. (2012-01-21 12:29:15)
```

See also

- show vdisks

set volume

Description Changes a volume's name and identifying information.

Syntax

```
set volume
    [access read-write|rw|read-only|ro]
    [identifying-information description]
    [name new-name]
    volume
```

Parameters

`access read-write|rw|read-only|ro`
Deprecated; to change mapping settings, use the map volume on page 98.

`identifying-information` *`description`*
Optional. A description of the volume to help a host-side user identify it. The value can have a maximum of 127 bytes, using printable UTF-8 characters except left angle bracket, double quote, or backslash. A value that contains a space must be enclosed in double quotes.

`name` *`new-name`*
Optional. A new name for the volume. For volume syntax, see Command syntax on page 20.

`volume`
Name or serial number of the volume to change. For volume syntax, see Command syntax on page 20.

Example Rename volume `V1` to `V2`:

```
# set volume name V2 V1
Success: Command completed successfully. - The specified volume name change(s)
were made. (2012-01-21 14:36:13)
```

Set identifying information for `V3`:

```
# set volume identifying-information "Project X data" V3
Success: Command completed successfully. - The specified volume name change(s)
were made. (2012-01-21 14:36:33)
```

See also

- show host-maps
- show volumes
- show volume-maps

show advanced-settings

Description Shows the settings for advanced system-configuration options.

Syntax `show advanced-settings`

Output `Vdisk Background Scrub`
Shows whether disks in vdisks are automatically checked for disk defects to ensure system health. The interval between background vdisk scrub finishing and starting again is specified by the Vdisk `Background Scrub Interval` field.

- `Disabled`: Background vdisk scrub is disabled. This is the default.
- `Enabled`: Background vdisk scrub is enabled.

`Vdisk Background Scrub Interval`
Shows the interval between background vdisk scrub finishing and starting again, from 1–360 hours. The default is 24 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 vdisk verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect vdisk background scrub, which always runs at “background” priority.)

- `High`: Utilities have higher priority than host I/O. This can cause heavy I/O to be slower than normal. 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.

`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. This is the default.
- `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 vdisk if no compatible spare is available.

- `Disabled`: The dynamic spares feature is disabled. This is the default.
- `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 5–3600 seconds. The default is 5 seconds.

`Host Control of Caching`
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. This is the default.
- `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.
- `Flush To Disk`: Good status is returned only after all write-back data for the specified volume is flushed to disk.

`Independent Cache Performance Mode`
Shows the cache redundancy mode for a dual-controller storage system.

- `Disabled`: Controller failover is enabled and data in a controller's write-back cache is mirrored to the partner controller. This is the default.
- `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. This is the default.
- `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.

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

`Supercap Failure`
Shows whether the cache policy will change from write-back to write-through when the super-capacitor that provides backup power for cache is not fully charged or fails.

- `Disabled`: The super-capacitor failure trigger is disabled.
- `Enabled`: The super-capacitor failure trigger is enabled. This is the default.

`CompactFlash Failure`
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. This is the default.

`Power Supply Failure`
Shows whether the cache policy will change from write-back to write-through when a power supply fails.

- `Disabled`: The power-supply failure trigger is disabled. This is the default.
- `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. This is the default.
- `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 failure trigger is disabled. This is the default.
- `Enabled`: The over-temperature failure trigger is enabled.

`Partner Notify`
Shows whether the partner controller will be notified when a trigger condition occurs.

- `Disabled`: Notification is disabled; the partner controller will continue using its current caching mode. This is the default.
- `Enabled`: Notification is enabled; the partner controller will change to write-through mode for better data protection.

`Auto Write Back`
Shows whether the cache mode will change from write-through to write-back when the trigger condition is cleared.

- `Disabled`: Auto-write-back is disabled.
- `Enabled`: Auto-write-back is enabled. This is the default.

`Drive Spin Down Non-Vdisk Enable`
Shows whether available disks and global spares will spin down after a period of inactivity shown by the `Drive Spin Down Non-Vdisk Delay` field.

- `Disabled`: Drive spin down for available disks and global spares is disabled. This is the default.
- `Enabled`: Drive spin down for available disks and global spares is enabled.

`Drive Spin Down Non-Vdisk Delay`
Shows the period of inactivity in minutes after which available disks and global spares will spin down, from 1–360 minutes. The default is 15 minutes. The value 0 means spin down is disabled.

`Disk Background Scrub`
Shows whether disks that are not in vdisks 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. This is the default.
- `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. This is the default.
- `Enabled`: The managed logs feature is enabled.

Example Show advanced system-configuration settings:

```
# show advanced-settings
Vdisk Background Scrub: Enabled
Vdisk Background Scrub Interval: 24
Partner Firmware Upgrade: Disabled
Utility Priority: High
SMART: Enabled
Dynamic Spare Configuration: Disabled
Enclosure Polling Rate: 5
Host Control of Caching: Enabled
Sync Cache Mode: Immediate
Independent Cache Performance Mode: Disabled
Missing LUN Response: Not Ready
Controller Failure: Disabled
Supercap Failure: Enabled
CompactFlash Failure: Enabled
Power Supply Failure: Disabled
Fan Failure: Disabled
Temperature Exceeded: Disabled
Partner Notify: Disabled
Auto Write Back: Enabled
Drive Spin Down Non-Vdisk Enable: Enabled
Drive Spin Down Non-Vdisk Delay: 30
Disk Background Scrub: Disabled
Managed Logs: Disabled

Success: Command completed successfully. (2012-01-18 14:29:38)
```

Basetypes

- advanced-settings-table
- status

See also

- set advanced-settings

show auto-write-through-trigger

Description Shows the system's write-through trigger settings. When a trigger condition occurs and the trigger is enabled, the RAID controller cache mode changes from write-back to write-through. Alias: `show awt`.

Syntax `show auto-write-through-trigger`

Output `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. This is the default.
- `Enabled`: The controller failure trigger is enabled.

`Supercap Failure`
Shows whether the cache policy will change from write-back to write-through when the super-capacitor that provides backup power for cache is not fully charged or fails.

- `Disabled`: The super-capacitor failure trigger is disabled.
- `Enabled`: The super-capacitor failure trigger is enabled. This is the default.

`CompactFlash Failure`
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. This is the default.

`Power Supply Failure`
Shows whether the cache policy will change from write-back to write-through when a power supply fails.

- `Disabled`: The power-supply failure trigger is disabled. This is the default.
- `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. This is the default.
- `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 failure trigger is disabled. This is the default.
- `Enabled`: The over-temperature failure trigger is enabled.

`Partner Notify`
Shows whether the partner controller will be notified when a trigger condition occurs.

- `Disabled`: Notification is disabled; the partner controller will continue using its current caching mode. This is the default.
- `Enabled`: Notification is enabled; the partner controller will change to write-through mode for better data protection.

`Auto Write Back`
Shows whether the cache mode will change from write-through to write-back when the trigger condition is cleared.

- `Disabled`: Auto-write-back is disabled.
- `Enabled`: Auto-write-back is enabled. This is the default.

Example Show the system's auto-write-through trigger settings:

```
# show auto-write-through-trigger
Auto Write-Through Triggers
---------------------------
Controller Failure: Disabled
Supercap Failure: Enabled
CompactFlash Failure: Enabled
Power Supply Failure: Disabled
Fan Failure: Disabled
Temperature Exceeded: Disabled
Partner Notify: Disabled
Auto Write Back: Enabled

Success: Command completed successfully. (2012-01-18 14:30:31)
```

Basetypes
- auto-write-through-trigger
- status

See also
- set auto-write-through-trigger

show awt

See show auto-write-through-trigger.

show cache-parameters

Description Shows cache settings and status for the system and optionally for a volume.

Syntax `show cache-parameters [volume]`

Parameters *volume*
Optional. Name or serial number of the volume to show settings for. For volume syntax, see Command syntax on page 20. If this parameter is not specified, only system-wide settings are shown.

Output

System/controller 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`: There is only a single controller in the enclosure.
- `Fail 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.

`Write Back Status`
Shows 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.

- `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.
- `Unknown`: The CompactFlash card's status is 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 default and 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`: Optimizes cache for both sequential and random reads. Appropriate for applications that read and write small files in random order, such as transaction-based and database update applications. This is the default.
- `no-mirror`: When this mode is enabled, each controller stops mirroring its cache metadata to the partner controller. This improves write I/O response time but at the risk of losing data during a failover. ULP behavior is not affected, with the exception that during failover any write data in cache will be lost.

`Read Ahead Size`
If a volume is specified, its read-ahead cache setting:

- `Disabled`: Read-ahead caching is disabled.
- `Default`: One chunk for the first access in a sequential read and one stripe for all subsequent accesses.
- `Maximum`: Maximum read-ahead size calculated by the controller.
- `64 KB`, `128 KB`, `256 KB`, `512 KB`, `1 MB`, `2 MB`, `4 MB`, `8 MB`, `16 MB`, or `32 MB`: Size selected by a user.

Example Show the cache parameters for the system and for volume `V1`:

```
# show cache-parameters V1
System Cache Parameters
-----------------------
Operation Mode: Active-Active ULP

  Controller A Cache Parameters
  -----------------------------
  Write Back Status: Enabled
  CompactFlash Status: Installed
  Cache Flush: Enabled

  Controller B Cache Parameters
  -----------------------------
  Write Back Status: Enabled
  CompactFlash Status: Installed
  Cache Flush: Enabled

Volume Cache Parameters
-----------------------
Serial Number: SN
Name: V1
Cache Write Policy: write-back
Cache Optimization: standard
Read Ahead Size: Default

Success: Command completed successfully. (2012-01-18 14:31:19)
```

Basetypes

- cache-settings
- cache-parameter
- status

See also

- set cache-parameters
- show volumes

show certificate

Description Shows the status of the system's security certificate.

Syntax `show certificate`

Output `Certificate Status`

- `Default`: No customer-supplied or alternate certificate has been installed.
- `Customer-supplied`: A custom or alternate certificate has been installed.

`Time Created`
Date and time in the format *`year-month-day hour:minutes:seconds`* when the custom certificate was created.

Example Show certificate status for the system:

```
# show certificate
Certificate Status
------------------
Certificate Status: Customer-supplied
Time Created: 2012-09-27 10:41:03

Success: Command completed successfully. (2012-09-27 11:15:09)
```

Basetypes

- certificate-status

See also

- create certificate

show chap-records

Description For iSCSI, shows all CHAP records or the record for a specific originator. This command is permitted whether or not CHAP is enabled.

Syntax

```
show chap-records [name originator-name]
```

Parameters

`name originator-name`
Optional. The originator name, typically in IQN format. If this parameter is omitted, the command displays CHAP records for all originators.

Output

`Initiator Name`
Originator name.

`Initiator Secret`
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.

Example Show the CHAP record for a specific host initiator:

```
# show chap-records name iqn.1991-05.com.microsoft:myhost.domain
CHAP Record(s)
--------------
Initiator Name: iqn.1991-05.com.microsoft:myhost.domain
Initiator Secret: 123456abcDEF
Mutual CHAP Name: iqn.1995-03.com.acme:01.storage.00c0ffd6000a
Mutual CHAP Secret: ABCdef123456

Success: Command completed successfully. (2012-01-18 14:31:50)
```

Basetypes

- chap-records
- status

See also

- create chap-record
- delete chap-records
- set chap-record
- show host-parameters

show cli-parameters

Description Shows the current CLI session preferences.

Syntax `show cli-parameters`

Output `Timeout`
Time in seconds that the session can be idle before it automatically ends. Valid values are 120–43200 seconds (2–720 minutes). The default is 1800 seconds (30 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. 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.
- `ipa`: Alternate form of XML output for internal use only.
- `json`: Alternate data-interchange format for internal use only.

`Brief Mode`

- `Enabled`: In XML output, shows a subset of attributes of object properties. The `name` and `type` attributes are always shown.
- `Disabled`: In XML output, shows all attributes of object properties. This is the default.

`Base`
Base for entry and display of storage-space sizes:

- `2`: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude.
- `10`: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. This 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.

`Pager`

- `Enabled`: Halts output after each full screen to wait for keyboard input. This is the default.
- `Disabled`: Output is not halted. When displaying output in XML API format, which is intended for scripting, disable paging.

`Locale`
Display language. The default is English.

`Precision`
Number of decimal places (1–10) shown for display of storage-space sizes. The default is 1.

`Units`
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.

`Temperature Scale`

- `Fahrenheit`: Temperatures are shown in degrees Fahrenheit.
- `Celsius`: Temperatures are shown in degrees Celsius. This is the default.

Example Show current CLI settings:

```
# show cli-parameters
CLI Parameters
--------------
Timeout: 1800
Output Format: Console
Brief Mode: Disabled
Base: 10
Pager: Enabled
Locale: English
Precision: 1
Units: Auto
Temperature Scale: Celsius

Success: Command completed successfully. (2012-01-18 14:32:33)
```

Basetypes

- cli-parameters
- status

See also

- set cli-parameters

show configuration

Description Shows system configuration information.

Syntax `show configuration`

Output

- System information from show system
- Controller information from show controllers
- Controller firmware and hardware version information from versions with the `details` option.
- Host and expansion port information from show ports
- Disk information from show disks
- Disk information by enclosure from show disks with the `encl` option.
- Vdisk information from show vdisks
- Enclosure status information from show enclosures
- Field-replaceable unit (FRU) information from show frus

Basetypes

- system
- controllers
- versions
- port
- drives
- enclosure-list
- virtual-disks
- enclosures
- status

show controller-date

Description Shows the system's current date and time.

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.

Example Show the date and time on a system that is using NTP:

```
# show controller-date
Controller Date: 2012-01-18 14:57:04
Time-Zone Offset: -6:00

Success: Command completed successfully. (2012-01-18 14:57:04)
```

Basetypes

- time-settings-table
- status

See also

- set controller-date
- show ntp-status

show controllers

Description Shows information about each controller module in the storage system.

Syntax `show controllers`

Output `Controller ID`

- `A`: Controller A.
- `B`: Controller B.

`Serial Number`

- Serial number of the controller module.
- `Not Available`: The controller module is down or not installed.

`Hardware Version`
Controller module hardware version.

`CPLD Version`
Complex Programmable Logic Device firmware version.

`MAC Address`
Controller network port MAC address.

`WWNN`
Storage system World Wide Node Name (WWNN).

`IP Address`
Controller network port IP address.

`IP Subnet Mask`
Controller network port IP subnet mask.

`IP Gateway`
Controller network port gateway IP address.

`Disks`
Number of disks in the storage system.

`Vdisks`
Number of vdisks in the storage system.

`Cache Memory Size (MB)`
Controller module cache memory size (MB).

`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`
- `Unknown`

`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` is `Yes`, a reason for the failover appears; otherwise, `Not applicable` appears.

`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.

`Position`
Position of the controller in the enclosure:

- `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. This is the default.
- `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.
- `Fail 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.

Example Show controller information:

```
# show controllers
Controllers
-----------
Controller ID: A
Serial Number: SN
Hardware Version: 25
CPLD Version: 8
MAC Address: 00:C0:FF:27:50:24
WWNN: WWNN
IP Address: 10.134.11.100
IP Subnet Mask: 255.255.0.0
IP Gateway: 10.134.0.1
Disks: 17
Vdisks: 2
Cache Memory Size (MB): 1024
Host Ports: 4
Disk Channels: 2
Disk Bus Type: SAS
Status: Operational
Failed Over to This Controller: No
Fail Over Reason: Not applicable
Health: OK
Health Reason:
Health Recommendation:
Position: Top
Phy Isolation: Enabled
Controller Redundancy Mode: Active-Active ULP
Controller Redundancy Status: Redundant

Controllers
-----------
Controller ID: B
...

Success: Command completed successfully. (2012-01-18 14:58:54)
```

Basetypes

- controllers
- status

See also

- show configuration
- show frus

show controller-statistics

Description Shows live performance statistics for controller A, B, or both.

Properties shown only in XML API format are described in XML API basetype properties on page 341.

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`
Controller ID in the form `controller_`*`ID`*.

`CPU Load`
Percentage of time the CPU is busy, from 0–100.

`Power On Time (Secs)`
Number of seconds since the controller was restarted.

`Bytes per second`
Data transfer rate 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.

`Number of Reads`
Number of read operations since these statistics were last reset or since the controller was restarted.

`Number of 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.

`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.

`Total Power On Hours`
The total amount of hours the controller has been powered on in its life time.

Example Show statistics for controller A:

```
# show controller-statistics a
Durable ID    CPU Load  Power On Time (Secs)  Bytes per second  IOPS
  Number of Reads  Number of Writes  Data Read  Data Written
  Reset Time           Total Power On Hours
------------------------------------------------------------------------
controller_A  5         437034               5596.6KB          406
  235196190        331183103         6922.3GB   7999.1GB
  2012-01-18 10:14:50  127449.88
------------------------------------------------------------------------
Success: Command completed successfully. (2012-09-19 11:34:41)
```

Basetypes

- controller-statistics
- status

See also

- reset all-statistics
- reset controller-statistics
- show disk-statistics
- show host-port-statistics
- show vdisk-statistics
- show volume-statistics

show debug-log-parameters

Description **For use by or with direction from a service technician.**

Shows which debug message types are enabled (`On`) or disabled (`Off`) for inclusion in the Storage Controller debug log.

Syntax

```
show debug-log-parameters
```

Output

- `host`: Host interface debug messages. Enabled by default.
- `disk`: Disk interface debug messages. Enabled by default.
- `mem`: Internal memory debug messages. Disabled by default.
- `fo`: Failover and recovery debug messages. Enabled by default.
- `msg`: Inter-controller message debug messages. Enabled 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.
- `misc`: Internal debug messages. Enabled by default.
- `rcm`: Removable-component manager debug messages. Disabled by default.
- `raid`: RAID debug messages. Enabled by default.
- `cache`: Cache debug messages. Enabled by default.
- `emp`: Enclosure Management Processor debug messages. Enabled by default.
- `capi`: Internal Configuration API debug messages. Enabled by default.
- `mui`: Internal service interface debug messages. Enabled by default.
- `bkcfg`: Internal configuration debug messages. Enabled by default.
- `awt`: Auto-write-through cache triggers debug messages. Disabled by default.
- `res2`: Internal debug messages. Disabled by default.
- `capi2`: Internal Configuration API tracing debug messages. Disabled by default.
- `dms`: Snapshot feature debug messages. Enabled by default.
- `fruid`: FRU ID debug messages. Enabled by default.
- `resmgr`: Reservation Manager debug messages. Disabled by default.
- `init`: Not used.
- `ps`: Not used.
- `hb`: Not used.

Example Show debug log parameters:

```
# show debug-log-parameters
Debug Log Parameters
--------------------
host: On
disk: On
mem: Off
...

Success: Command completed successfully. (2012-01-18 14:59:52)
```

Basetypes

- debug-log-parameters
- status

See also

- set debug-log-parameters

show disk-parameters

Description Shows disk settings.

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. This is the default.
- `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 parameter cannot be changed.

`Timeout Retry Maximum`
Maximum number of times a timed-out I/O operation can be retried before the operation is failed.

`Attempt Timeout`
Number of seconds before an I/O operation is aborted and possibly retried.

Overall Timeout
Total time in seconds before an I/O operation is failed regardless of the `Attempt Timeout` and `Number of Retries` settings.

`Drive Spin Down Non-Vdisk Enable`
Shows whether available disks and global spares will spin down after a period of inactivity shown by the `Drive Spin Down Non-Vdisk Delay` field.

- `Disabled`: Drive spin down for available disks and global spares is disabled. This is the default.
- `Enabled`: Drive spin down for available disks and global spares is enabled.

`Drive Spin Down Non-Vdisk Delay`
Shows the period of inactivity in minutes after which available disks and global spares will spin down, from 1–360 minutes. The default is 15 minutes. The value 0 means spin down is disabled.

Example Show disk settings:

```
# show disk-parameters
Disk Parameters
---------------
SMART: Enabled
Drive Write Back Cache: Disabled
Timeout Retry Maximum: 3
Attempt Timeout: 8
Overall Timeout: 105
Drive Spin Down Non-Vdisk Enable: Disabled
Drive Spin Down Non-Vdisk Delay: 0

Success: Command completed successfully. (2012-01-18 15:00:13)
```

Basetypes

- drive-parameters
- status

See also

- set disk-parameters

show disks

Description Shows information about all disks in the storage system. If no parameter is specified, the command shows information for all installed disks.

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.

Syntax To show information about disks:

```
show disks
    [disks]|[free]|[all]|[vdisk vdisk]
    [perf]
```

To show information about all disk slots:

```
show disks encl
```

Parameters

disks
Optional. IDs of the disks to show information about. For disk syntax, see Command syntax on page 20.

free
Optional. Shows information about all disks that are available.

all
Optional. Shows information about all installed disks.

vdisk *vdisk*
Optional. Shows information for disks in the specified vdisk. For vdisk syntax, see Command syntax on page 20.

perf
Optional. 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.

encl
Optional. Shows information about each disk slot, whether it contains a disk or not. Do not specify this parameter with other parameters; they will be ignored.

Output

Without the `encl` option:

Location
Disk's enclosure ID and slot number.

Serial Number
Disk serial number.

Vendor
Disk vendor.

Rev
Firmware revision number.

`How Used`

- `AVAIL`: Available.
- `FAILED`: The disk is unusable and must be replaced. Reasons for this status include: excessive media errors; SMART error; disk hardware failure; unsupported disk.
- `GLOBAL SP`: Global spare.
- `LEFTOVR`: Leftover.
- `VDISK`: Used in a vdisk.
- `VDISK SP`: Spare assigned to a vdisk.

Any jobs running on the disk or its vdisk follow the How Used value:

- `DRSC`: The disk is being scrubbed.
- `EXPD`: The vdisk is being expanded.
- `INIT`: The vdisk is being initialized.
- `RCON`: The vdisk is being reconstructed.
- `VRFY`: The vdisk is being verified.
- `VRSC`: The vdisk is being scrubbed.

`Type`

- SAS: Dual-port SAS.
- SAS-S: Single-port SAS.
- SATA: Dual-port SATA.
- SATA-S: Single-port SATA.
- sSATA: Dual-port SATA SSD.
- sSAS: Dual-port SAS SSD.

`Size`
Disk capacity.

`Rate*(Gb/s)`
Data transfer rate in Gbit/second. A footnote indicates that it is normal behavior for the rate to vary.

Some 6-Gbps disks might not consistently support a 6-Gbps transfer rate. If this happens, the controller automatically adjusts transfers to those disks to 3 Gbps, increasing reliability and reducing error messages with little impact on system performance. This rate adjustment persists until the controller is restarted or power-cycled.

`SP`
Shows which controller a single-ported disk is connected to.

`Total I/Os`
If the `perf` parameter is specified, this field shows the total number of I/Os (reads and writes).

`Data Transferred`
If the `perf` parameter is specified, this field shows the total number of bytes transferred.

`I/O Resp Time`
If the `perf` parameter is specified, this field shows the total time to complete I/O.

`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.

With the `encl` option:

`Status`

- `Up`: The disk is present and is properly communicating with the expander.
- `Spun Down`: The disk is present and has been spun down by the drive spin down feature.
- `Warning`: The disk is present but the system is having communication problems with the disk LED processor. For disk and midplane types where this processor also controls power to the disk, power-on failure will result in `Error` status.
- `Error`: The disk is present but is not detected by the expander.
- `Unknown`: Initial status when the disk is first detected or powered on.
- `Not Present`: The disk slot indicates that no disk is present.

`Encl`
Enclosure number where the disk is located.

`Slot`
Slot number in the enclosure where the disk is located.

`Vendor`
Disk vendor.

`Model`
Disk model number.

`Serial Number`
Disk serial number.

`Size`
Disk size.

Example Show information for all installed disks:

```
# show disks
Location  Serial Number  Vendor    Rev    How Used    Type    Size
  Rate*(Gb/s)  SP  Health
  Health Reason
  Health Recommendation
--------------------------------------------------------------------------------
0.0       SN             vendor    rev    VDISK       SAS     146.8GB
  3.0              OK
0.1       SN             vendor    rev    AVAIL       SAS     146.8GB
  3.0              N/A
  The disk has been spun down by the drive-spin-down feature.
  - No action is required.
0.2       SN             vendor    rev    LEFTOVR     SAS     146.8GB
  3.0              Degraded
  A disk that was previously a member of a vdisk has been detected.
  - If the associated vdisk is offline or quarantined, contact technical
support; otherwise, clear the disk's metadata to reuse the disk.
0.3       SN             vendor    rev    VDISK SP    SAS     146.8GB
  3.0              OK
...
1.0       SN             vendor    rev    GLOBAL SP   SATA-S  120.0GB
  3.0          A   OK
1.1       SN             vendor    rev    VDISK VRFY  SATA-S  120.0GB
  3.0          A   OK
...
--------------------------------------------------------------------------------
Info: * Rates may vary. This is normal behavior. (2012-01-18 08:10:01)

Success: Command completed successfully. (2012-01-18 08:10:01)
```

Show information for all disks:

```
# show disks encl
Status       Encl  Slot  Vendor  Model  Serial Number  Size
--------------------------------------------------------------------------------
Up           0     0     vendor  model  SN             146.8GB
Not Present  0     1     N/A     N/A    N/A            N/A
...
--------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 09:23:11)
```

Show performance statistics for all installed disks:

```
# show disks perf
Location  Serial Number  Vendor    Rev    How Used    Type    Size
  Rate*(Gb/s)  SP  Total I/Os  Data Transferred  I/O Resp Time  Health
  Health Reason  Health Recommendation
--------------------------------------------------------------------------------
0.0       <SN>           <vendor>  <rev>  VDISK       SAS     146.8GB
  3.0              1263524500  25.6MB            71             OK
...
--------------------------------------------------------------------------------
Info: * Rates may vary. This is normal behavior. (2012-01-18 12:57:41)

Success: Command completed successfully. (2012-01-18 12:57:41)
```

Basetypes
- drives
- enclosure-list
- status

See also
- show vdisks

show disk-statistics

Description Shows live or historical performance statistics for disks. You can view live statistics for all or specified disks, or historical statistics for a specified disk. The system samples disk-performance statistics every quarter hour and retains performance data for 30 days only.

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.

Properties shown only in XML API format are described in XML API basetype properties on page 341.

Syntax To show live statistics:

```
show disk-statistics [disks]
```

To show historical statistics:

```
show disk-statistics
   disk
   historical
   [time-range "date/time-range"]
   [count number-of-data-samples]
   [all]
```

Parameters *disks*
Optional. Identifies one or more disks to show live statistics for. If this parameter is omitted, statistics will be shown for all disks. For disk syntax, see Command syntax on page 20.

disk
Identifies one disk to show historical statistics for. For disk syntax, see Command syntax on page 20.

`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.

`count` *number-of-data-samples*
Optional. Specifies the number of data samples to display, from 1–100. 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.

`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.

Output (Live)

`Durable ID`
Disk ID in the form `disk_`*`enclosure-number.disk-number`*.

`Serial Number`
Disk serial number.

`Bytes per second`
Data transfer rate 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.

`Number of Reads`
Number of read operations since these statistics were last reset or since the controller was restarted.

`Number of 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.

`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.

Output (Historical)

`Durable ID`
Disk ID in the form `disk_`*`enclosure-number.disk-number`*.

`Serial Number`
Disk serial number.

`Total I/Os`
Total number of read and write operations since the last sampling time.

`Number of Reads`
Shown by the `all` parameter. Number of read operations since the last sampling time.

`Number of Writes`
Shown by the `all` parameter. Number of write operations since the last sampling time.

`Data Transferred`
Total amount of data read and written since the last sampling time.

`Data Read`
Shown by the `all` parameter. Amount of data read since the last sampling time.

`Data Written`
Shown by the `all` parameter. Amount of data written since the last sampling time.

`Total IOPS`
Total number of read and write operations per second since the last sampling time.

`Read IOPS`
Shown by the `all` parameter. Number of read operations per second since the last sampling time.

`Write IOPS`
Shown by the `all` parameter. Number of write operations per second since the last sampling time.

`Total Bps`
Total data transfer rate, in bytes per second, since the last sampling time.

`Read Bps`
Shown by the `all` parameter. Data transfer rate, in bytes per second, for read operations since the last sampling time.

`Write Bps`
Shown by the `all` parameter. Data transfer rate, in bytes per second, for write operations since the last sampling time.

`Queue Depth`
Shown by the `all` parameter. 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`
Average response time, in microseconds, for read and write operations since the last sampling time.

`Read Resp Time`
Shown by the `all` parameter. Average response time, in microseconds, for read operations since the last sampling time.

`Write Resp Time`
Shown by the `all` parameter. Average response time, in microseconds, for write operations since the last sampling time.

`Average I/O Size`
Shown by the `all` parameter. Average data size of read and write operations since the last sampling time.

`Average Read I/O Size`
Shown by the `all` parameter. Average data size of read operations since the last sampling time.

`Average Write I/O Size`
Shown by the `all` parameter. Average data size of write operations since the last sampling time.

`Number of Disk Errors`
Shown by the `all` parameter. 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.

Example Show live statistics for disks 1.1 and 2.1:

```
# show disk-statistics 1.1,2.1
Durable ID  Serial Number  Bytes per second  IOPS  Number of Reads
  Number of Writes  Data Read  Data Written  Reset Time
------------------------------------------------------------------------------
disk_1.1    SN             3936.2KB          67    23241330
  14457080          1309.8GB   857.1GB       2012-01-17 19:22:54
disk_2.1    SN             4972.0KB          85    33941798
  14529518          1935.5GB   846.1GB       2012-01-17 21:01:20
------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 12:53:55)
```

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"
Durable ID           Serial Number
-----------------------------------------
disk_1.5             SN

   Total I/Os  Data Transferred  Total IOPS  Total Bps  I/O Resp Time
     Sample Time
   ------------------------------------------------------------------------------
   183018      11.9GB            203         13.3MB     222
     2011-12-05 17:00:00
   1961773     128.5GB           2179        142.8MB    240
     2011-12-05 16:45:00
-----------------------------------------
Success: Command completed successfully. (2012-01-18 12:39:11)
```

Show all samples of historical statistics for disk 1.5:

```
# show disk-statistics 1.5 historical all
Durable ID           Serial Number
-----------------------------------------
disk_1.5             SN

   Total I/Os   Number of Reads  Number of Writes  Data Transferred  Data Read
     Data Written  Total IOPS  Read IOPS  Write IOPS  Total Bps  Read Bps
     Write Bps  Queue Depth  I/O Resp Time  Read Resp Time  Write Resp Time
     Average I/O Size  Average Read I/O Size  Average Write I/O Size
     Number of Disk Errors  Sample Time
   ------------------------------------------------------------------------------
   121174       60588            60586            5800.5MB          2900.3MB
     2900.1MB      134         67         67          6445.0KB   3222.5KB
     3222.0KB   709072       13062          12759           13366
     47.6KB            47.6KB                47.6KB
     0                      2012-01-18 12:30:00
   ...
-----------------------------------------
Success: Command completed successfully. (2012-01-18 12:39:27)
```

Basetypes

- disk-statistics (live)
- drive-summary (historical)
- status

See also

- reset all-statistics
- reset disk-error-statistics
- reset disk-statistics
- show controller-statistics
- show disks
- show host-port-statistics
- show vdisk-statistics
- show volume-statistics

show email-parameters

Description Shows email (SMTP) notification parameters for events and managed logs.

Syntax `show email-parameters`

Output `Email Notification`

- `Disabled`: Email notification is disabled. This is the default.
- `Enabled`: Email notification is enabled.

`Email Notify Filter`

Shows the minimum severity for which the system should send event notifications:

- `crit`: Sends notifications for Critical events only.
- `error`: Sends notifications for Error and Critical events.
- `warn`: Sends notifications for Warning, Error, and Critical events.
- `info`: Sends notifications for all events.
- `none`: Disables email notification and clears the settings. This is the default.

This parameter does not apply to managed-logs notifications.

`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.

`Email Server`
The IP address 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.

`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. This option is disabled by default.

Example Show settings for email notification:

```
# show email-parameters
Email Parameters (SMTP)
-----------------------
Email Notification: Enabled
Email Notify Filter: warn
Email Address 1: sysadmin@mydomain.com
Email Address 2:
Email Address 3:
Log Destination: logCollector@mydomain.com
Email Server: 10.1.1.10
Email Domain: mydomain.com
Email Sender: RAIDsystem
Include Logs: Disabled

Success: Command completed successfully. (2012-01-18 12:51:04)
```

Basetypes
- email-parameters
- status

See also
- set email-parameters

show enclosures

Description Shows information about the enclosures in the storage system. Full detail available in XML API output only.

Syntax `show enclosures`

Output `Encl`
Enclosure ID.

`Encl WWN`
Enclosure WWN.

`Name`
Enclosure name.

`Location`
Enclosure location; blank if not set.

`Rack`
Number of the rack containing the enclosure.

`Pos`
Position of the enclosure in the rack.

`Vendor`
Enclosure vendor.

`Model`
Enclosure model.

`EMP # BUS:ID Rev`
Address and firmware revision of the Enclosure Management Processor in each controller's Expander Controller.

`Midplane Type`

- `2U24-6Gv2`: Midplane for 2U, reduced-depth, 24-disk enclosure with 6-Gbps maximum data rate to disks.
- `2U24-6G`: Midplane for 2U, 24-disk enclosure with 6-Gbps maximum data rate to disks.
- `2U24-3G`: Midplane for 2U, 24-disk enclosure with 3-Gbps maximum data rate to disks.
- `2U12-6Gv2`: Midplane for 2U, reduced-depth, 12-disk enclosure with 6-Gbps maximum data rate to disks.
- `2U12-6G`: Midplane for 2U, 12-disk enclosure with 6-Gbps maximum data rate to disks.
- `2U12-3G`: Midplane for 2U, 12-disk enclosure with 3-Gbps maximum data rate to disks.
- `N/A`: Other type of midplane.

`PCIe 2-Capable`
Shown for 3XX3 models only.

- `False`: Enclosure is not capable of using PCI Express version 2.
- `True`: Enclosure is capable of using PCI Express version 2.

`Health`

- `OK`
- `Degraded`
- `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.

Example Show information about the enclosures:

```
# show enclosures
Encl  Encl WWN  Name        Location  Rack  Pos  Vendor    Model
    EMP A CH:ID  Rev  EMP B CH:ID Rev  Midplane Type  Health  Health Reason
    Health Recommendation
-------------------------------------------------------------------------------
0     WWN       Controller  Lab       0     4    vendor    model
    01:031 1115       00:031 1115      2U24-3G        OK

-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:01:05)
```

Basetypes

- enclosures
- status

See also

- set enclosure
- show sensor-status

show enclosure-status

Description Deprecated; use show enclosures, show frus, or show sensor-status.

Shows the status of system enclosures and their components. For each attached enclosure, the command shows general SCSI Enclosure Services (SES) information followed by component-specific information.

Syntax `show enclosure-status`

Output

General SES fields:

`Chassis`
Chassis serial number.

`Vendor`
Enclosure vendor name.

`Product ID`
Product model identifier.

`CPLD`
Complex Programmable Logic Device version.

`EMP # BUS:ID Rev`
Address and firmware revision of the Enclosure Management Processor in each controller's Expander Controller.

`WWPN`
World wide port name of the SES device reporting the enclosure status.

`Status`
Overall status of the enclosure:

- `Absent`: The enclosure is not present.
- `Error`: The enclosure has a fault.
- `OK`: The enclosure is operating normally.

`Not Available`: Status is not available.

Enclosure Component Status fields:

`Type`
Component type:

- `FAN`: Cooling fan unit.
- `PSU`: Power supply unit.
- `Temp`: Temperature sensor.
- `Voltage`: Voltage sensor.
- `Disk`: Disk drive module.

`#`
Component ID

`Status`
Component status:

- `Absent`: The component is not present.
- Error: The component or at least one subcomponent has failed.
- Warning: The component or at least one subcomponent is not working normally.
- `OK`: The component and any subcomponents are working normally. Temperature status `OK` indicates that the sensor is working properly, not that the temperature is within an acceptable range.
- `N/A`: Status is not available.

`FRU P/N`
Part number of the field-replaceable unit (FRU) that contains the component.

`FRU S/N`
Serial number of the FRU that contains the component.

`Add'l Data`
Additional data, if applicable:

- `addr=`: For a disk, the slot address.
- `temp=`: For a temperature sensor, the temperature.
- `voltage=`: For a voltage sensor, the voltage.
- `--`: No data.

Example Show enclosure status:

```
# show enclosure-status
Chassis  Vendor    Product ID  CPLD  EMP A CH:ID  Rev   EMP B CH:ID  Rev
  WWPN    Status
-------------------------------------------------------------------------------
SN       vendor    product     21          00:031 1115        01:031 1115
  WWPN    OK
-------------------------------------------------------------------------------
Type     #   Status  FRU P/N  FRU S/N  Add'l Data
-----------------------------------------------------
FAN      00  OK      PN       SN       --
...
PSU      00  OK      PN       SN       --
...
Temp     00  OK      PN       SN       temp=37 C
...
Voltage  00  OK      PN       SN       voltage=11.86
...
Disk     00  OK      PN       SN       addr=0
...
-----------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:01:36)
```

Basetypes

- ses
- enclosure-components
- status

See also

- show enclosures

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.

For further information about diagnosing and resolving problems, see:

- The troubleshooting chapter and the LED descriptions appendix in your product's Setup Guide
- The topics about verifying component failure in your product's FRU Installation and Replacement Guide

Syntax To show a certain number of events:

```
show events
   [detail]
   [last #]
   [a|b|both|error]
```

To show events by time:

```
show events
   [detail]
   [from timestamp]
   [to timestamp]
   [a|b|both|error]
```

To show events by ID:

```
show events
   [detail]
   [from-event event-ID]
   [to-event event-ID]
   [a|b|both|error]
```

Parameters `detail`
Optional. Shows additional information and recommended actions for displayed events. This information is also in the Event Descriptions Reference Guide.

`last #`
Optional. Shows the latest specified number of events. If this parameter is omitted, all events are shown.

`from timestamp`
Optional. Shows events including and 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.

`to timestamp`
Optional. Shows events before and including 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.

`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.

`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.

`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.

Output

- Date and time when the event was logged
- Event code identifying the type of event to help diagnose problems; for example, `[181]`
- 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.
- Event-specific message giving details about the event

Example 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 2011 at 11:59:00 p.m. through May 2 2011 at 11:59:00 a.m.:

```
# show events from 043011235900 to 050211115900
```

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
- status

See also

- clear events
- set snmp-parameters
- show snmp-parameters

show expander-status

Description **For use by or with direction from a service technician.**

Shows diagnostic information relating to SAS Expander Controller physical channels, known as PHY lanes. For each enclosure, this command shows status information for PHYs in I/O module A and then I/O module B.

Syntax `show expander-status`

Output `Encl`
Enclosure that contains the SAS expander.

`Ctlr`
I/O module that contains the SAS expander.

`Phy`
Identifies a PHY's logical location within a group based on the PHY type. Logical IDs are 0–23 for drive PHYs; 0–1 for SC PHYs; and 0–3 for other PHYs. If the PHY's controller module or expansion module is not installed, this field shows "`--`".

`Type`

- `Drive`: 1-lane PHY that communicates between the expander and a disk drive.
- `Egress`: 4-lane PHY that communicates between the expander and an expansion port or SAS Out port.
- `SC-1`: (Controller module only) 2-lane PHY that communicates between the expander and the partner's expander.
- `SC-0`: (Controller module only) 4-lane PHY that communicates between the expander and the SC.
- `Ingress`: (Expansion module only) 4-lane PHY that communicates between the expander and an expansion port.
- `Inter-Exp`: (Expansion module only) Communicates between the expander and the partner's expander.
- `Undefined`: No status information is available.
- `Unused`: The PHY exists in the expander but is not connected, by design.

`Status`

- `Enabled - Healthy`: The PHY is enabled and healthy.
- `Enabled - Degraded`: The PHY is enabled but degraded.
- `Disabled`: The PHY has been disabled by a user or by the system.

`Elem Status`
A standard SES status for the element:

- `Disabled`: Critical condition is detected.
- `Error`: Unrecoverable condition is detected. Appears only if there is a firmware problem related to PHY definition data.
- `Non-critical`: Non-critical condition is detected.
- `Not Used`: Element is not installed in enclosure.
- `OK`: Element is installed and no error conditions are known.
- `Unknown`: Either:
  - Sensor has failed or element status is not available. Appears only if an I/O module indicates it has fewer PHYs than the reporting I/O module, in which case all additional PHYs are reported as unknown.
  - Element is installed with no known errors, but the element has not been turned on or set into operation.

Disabled

- Enabled: PHY is enabled.
- Disabled: PHY is disabled.

Reason

- Blank if Elem Status is OK.
- Error count interrupts: PHY disabled because of error-count interrupts.
- Phy control: PHY disabled by a SES control page as a result of action by a Storage Controller or user.
- Not ready: PHY is enabled but not ready. Appears for SC-1 PHYs when the partner I/O module is not installed. Appears for Drive, SC-1, or Ingress PHYs when a connection problem exists such as a broken connector.
- 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.

Example Show expander status for a single-enclosure system with an empty disk slot:

```
# show expander-status
Encl  Ctlr  Phy  Type    Status              Elem Status   Disabled
  Reason
--------------------------------------------------------------------------------
0    A     0    Drive   Enabled - Healthy   OK            Enabled
0    A     1    Drive   Enabled - Degraded  Non-critical  Enabled
  Not ready
  ...
0    A     23   Drive   Disabled            OK            Disabled
  Drive removed
0    A     0    SC-1    Enabled - Healthy   OK            Enabled
0    A     1    SC-1    Enabled - Healthy   OK            Enabled
0    A     0    SC-0    Enabled - Healthy   OK            Enabled
  ...
0    A     3    SC-0    Enabled - Healthy   OK            Enabled
0    A     0    Egress  Enabled - Healthy   OK            Enabled
  ...
0    A     3    Egress  Enabled - Healthy   OK            Enabled
--------------------------------------------------------------------------------

Encl  Ctlr  Phy  Type    Status              Elem Status   Disabled
  Reason
--------------------------------------------------------------------------------
0    B     0    Drive   Enabled - Healthy   OK            Enabled
0    B     1    Drive   Enabled - Degraded  Non-critical  Enabled
  Not ready
  ...
0    B     23   Drive   Disabled            OK            Disabled
  Drive removed
0    B     0    SC-1    Enabled - Healthy   OK            Enabled
0    B     1    SC-1    Enabled - Healthy   OK            Enabled
0    B     0    SC-0    Enabled - Healthy   OK            Enabled
  ...
0    B     0    Egress  Enabled - Healthy   OK            Enabled
  ...
0    B     3    Egress  Enabled - Healthy   OK            Enabled
--------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:02:13)
```

Basetypes

- sas-status-controller-a
- status

See also

- clear expander-status
- set expander-fault-isolation
- set expander-phy

show fans

Description Shows information about each fan in the storage system.

Syntax `show fans`

Output `Name`
Fan name in the form `Fan loc:`*`position`*`-PSU `*`power-supply-ID`*. The position is as viewed from the back of the enclosure.

`Location`
Fan location in the form `Enclosure `*`enclosure-ID - position`*. The position is as viewed from the back of the enclosure.

`Status`

- `Up`
- `Warning`
- `Error`
- `Not Present`
- `Unknown`

`Speed`
Fan speed (RPM).

`Position`
Fan position, as viewed from the back of the enclosure:

- Left.
- Right.

`Serial Number`

- (blank): Not applicable.

`Firmware Version`

- (blank): Not applicable.

`Hardware Version`

- (blank): Not applicable.

`Health`

- `OK`
- `Degraded`
- `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.

Example Show fan information for a single-enclosure system:

```
# show fans
Name                 Location             Status  Speed  Position
  Serial Number  Firmware Version  Hardware Version  Health  Health Reason
  Health Recommendation
-------------------------------------------------------------------------------
Fan Loc:left-PSU 1   Enclosure 1 - Left   Up      4959   Left
                                                     OK

Fan Loc:right-PSU 2  Enclosure 1 - Right  Up      4959   Right
                                                     OK

-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 13:28:22)
```

Basetypes

- fan
- status

See also

- show power-supplies

show frus

Description Shows FRU (field-replaceable unit) information for the storage system. Some information is for use by service technicians.

Syntax `show frus`

Output **FRU fields:**

`Name`

- `CHASSIS_MIDPLANE`: 2U chassis and midplane circuit board.
- `RAID_IOM`: Controller module.
- `BOD_IOM`: Expansion module.
- `POWER_SUPPLY`: Power supply module.

`Description`
FRU description.

`Part Number`
FRU part number.

`Serial Number`
FRU serial number.

`Revision`
Hardware revision level.

`Dash Level`
FRU template revision number.

`FRU Shortname`
Short description.

`Manufacturing Date`
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`
City, state/province, and country where the FRU was manufactured.

`Manufacturing Vendor ID`
JEDEC ID of the manufacturer.

`FRU Location`
Location of the FRU in the enclosure:

- `MID-PLANE SLOT`: Chassis midplane.
- `UPPER IOM SLOT`: Controller module or expansion module A.
- `LOWER IOM SLOT`: Controller module or expansion module B.
- `LEFT PSU SLOT`: Power supply module on the left, as viewed from the back.
- `RIGHT PSU SLOT`: Power supply module on the right, as viewed from the back.

`Configuration SN`
Configuration serial number.

`FRU Status`

- `Absent`: Component is not present.
- `Fault`: One or more subcomponents has a fault.
- `OK`: All subcomponents are operating normally.
- `Not Available`: Status is not available.

`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`.

Basetypes

- enclosure-sku
- enclosure-fru
- status

show host-maps

Description Shows mapping information for volumes that are mapped to all hosts or to a specified host.

Syntax `show host-maps [host]`

Parameters *host*
Optional. Specifies the host's nickname or ID. If this parameter is omitted, mapping information for all hosts is shown.

Output ID

- For FC and SAS: Host WWPN.
- For iSCSI: iSCSI host initiator's node name (typically the IQN).

Name
Host port nickname.

Name
Name of the volume seen by the host.

Serial Number
Serial number of the volume seen by the host.

LUN
LUN used to access the volume.

Access
Type of host access to the volume:

- read-write: Read and write.
- read-only: Read only.
- no-access: No access.

Ports
Controller host ports that the mapping applies to.

Example Show volume mappings for all hosts:

```
# show host-maps
Host View [ID (AABBCCDDEEFF0011) Name (Host1) ] Mapping:
     Name   Serial Number                    LUN   Access       Ports
     ------------------------------------------------------------------
     vd2_v2 SN                               1     read-write   A0,A1,B0,B1
     vd2_v0 SN                               10    read-write   A1,B1
     vd2_v1 SN                                     no-access

  Host View [ID (1A2B3C4D5E6F8900) Name (Host2) ] Mapping:
     Name   Serial Number                    LUN   Access       Ports
     ------------------------------------------------------------------------
     vd2_v2 SN                               0     read-write   A0,A1,B0,B1
     vd2_v0 SN                               10    read-only    A1,B
     vd2_v1 SN                               11    read-write   A1

  Host View [ID (210100E08B33340B) Name (Host3) ] Mapping:
     Name   Serial Number                    LUN   Access       Ports
     ------------------------------------------------------------------
     vd2_v2 SN                               0     read-write   A0,A1,B0,B1
     vd2_v0 SN                               10    read-only    A1,B1
     vd2_v1 SN                                     no-access

Success: Command completed successfully. (2012-01-18 15:02:52)
```

Basetypes

- host-view
- status

See also

- show hosts
- show volume-maps
- show volumes

show host-parameters

Description Shows information about host ports on both controllers. This command shows the same information as the show ports command.

Syntax `show host-parameters`

Output

`Ports`
Controller ID and port number.

`Media`

- `FC(L)`: Fibre Channel-Arbitrated Loop (public or private).
- `FC(P)`: Fibre Channel Point-to-Point.
- `FC(-)`: Fibre Channel disconnected.
- `SAS`: Serial Attached SCSI.
- `iSCSI`: Internet SCSI.

`Target ID`
Port WWN or IQN.

`Status`

- `Up`: Port is cabled and has an I/O link.
- `Disconnected`: Either no I/O link is detected or the port is not cabled.

`Speed (A)`
Actual link speed in Gbit/sec. Blank if not applicable.

`Speed (C)`
Configured host-port link speed:

- FC: `Auto`, `8Gb`, `4Gb`, or `2Gb` (Gbit/sec).
- iSCSI: `Auto` or `1Gb` (Gbit/sec).
- Blank if not applicable.

`Health`

- `OK`
- `Degraded`
- `Fault`
- `N/A`

`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.

`Topo (C)`
FC and SAS only. Configured topology.

`Width`
SAS only. Number of PHY lanes in the SAS port.

`PID`
FC only. Primary loop ID, or blank if not applicable.

`IP-Ver`
iSCSI only. IP version: IPv4 or IPv6.

`PIP`
iSCSI only. Primary IP address.

PIP-Gateway
iSCSI only. Primary gateway IP address.

PIP-Netmask
iSCSI only. Primary subnet mask IP address.

MAC
iSCSI only. Unique Media Access Control (MAC) hardware address, also called the physical address.

SIP
iSCSI only. Secondary IP address. This field is only displayed during failover.

SIP-Gateway
iSCSI only. Secondary gateway IP address. This field is only displayed during failover.

SIP-Netmask
iSCSI only. Secondary subnet mask IP address. This field is only displayed during failover.

MAC(S)
iSCSI only. Secondary MAC address. This field is only displayed during failover.

Example Show port information for a system with two FC ports:

```
# show host-parameters
Ports Media    Target ID         Status        Speed(A) Speed(C)  Health
  Health Reason                Health Recommendation
-------------------------------------------------------------------------------
A0    FC(L)    WWPN              Up            8Gb      Auto      OK
  OK


   Topo(C) PID
   ------------
   Loop    0

A1    FC(-)    WWPN              Disconnected           Auto      N/A
  There is no host connection to this host port.  - No action is required.

   Topo(C) PID
   ------------
   Loop    0

-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:03:24)
```

Show port information for a system with two iSCSI ports:

```
# show host-parameters
Ports Media   Target ID         Status        Speed(A) Speed(C)  Health
  Health Reason                 Health Recommendation
-------------------------------------------------------------------------------
A0    iSCSI   IQN               Up            1Gb      Auto      OK


   IP-Ver PIP          PIP-Gateway PIP-Netmask MAC
   ------------------------------------------------------------
   IPv4   10.134.9.100 10.134.0.1  255.255.0.0 00:C0:FF:29:00:24

A1    iSCSI   IQN               Disconnected          Auto      N/A
  There is no host connection to this host port.  - No action is required.

   IP-Ver PIP          PIP-Gateway PIP-Netmask MAC
   ------------------------------------------------------------
   IPv4   10.134.9.101 10.134.0.1  255.255.0.0 00:C0:FF:29:00:23

-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:03:55)
```

Show port information for a system with two SAS ports:

```
# show host-parameters
Ports Media    Target ID         Status        Speed(A)  Health
  Health Reason                 Health Recommendation
-------------------------------------------------------------------------------
A0    SAS      WWPN              Up            Auto      OK


   Topo(C) Width
   --------------
   Direct  4

A1    SAS      WWPN              Disconnected  Auto      N/A
  There is no host connection to this host port.  - No action is required.

   Topo(C) Width
   --------------
   Direct  4

-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:04:10)
```

Basetypes

- port
- status

See also

- set host-parameters
- show ports

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.

Syntax `show host-port-statistics [ports ports]`

Parameters `ports ports`
Optional. The controller ID and port number of ports to show information about. For port syntax, see Command syntax on page 20. If this parameter is omitted, information is shown for all host ports.

Output `Durable ID`
Host port ID in the form `hostport_controller-ID-and-port-number.`

`Bytes per second`
Data transfer rate 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.

`Number of Reads`
Number of read operations since these statistics were last reset or since the controller was restarted.

`Number of 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.

`Queue Depth`
Number of pending I/O operations being serviced.

`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.

`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.

Example Show host-port statistics:

```
# show host-port-statistics
Durable ID   Bytes per second  IOPS  Number of Reads  Number of Writes
  Data Read  Data Written  Queue Depth  I/O Resp Time  Read Resp Time
  Write Resp Time  Reset Time
--------------------------------------------------------------------------------
hostport_A0  72.0MB            549   45372779         5020328
  5947.1GB   657.8GB       0            1517248        1106826
  5226569          2012-01-17 21:01:20
...
--------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 16:25:41)
```

Basetypes

- host-port-statistics
- status

See also

- reset all-statistics
- reset host-port-statistics
- show controller-statistics
- show disk-statistics
- show vdisk-statistics
- show volume-statistics
- show host-port-statistics
- show ports

show hosts

Description Shows hosts that volumes can be mapped to. Host entries are automatically created for hosts that have sent an `inquiry` command or a `report luns` command to the system. Hosts typically do this when they boot up or scan 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 nickname for the host.

Syntax `show hosts`

Output `Host ID`
Host WWPN or iSCSI node name.

`Name`
Host nickname.

`Discovered`

- `Yes`: The host was discovered and its entry was automatically created.
- `No`: The host entry was manually created.

`Mapped`
Shows whether the host is explicitly mapped to any volumes:

- `Yes`: At least one volume is explicitly mapped to the host.
- `No`: No volumes are explicitly mapped to the host.

`Host Type`

- 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`

Example Show hosts:

```
# show hosts
Host ID                                    Name      Discovered Mapped
  Host Type
------------------------------------------------------------------------
100000A0B8040BAC                                     Yes        No
  FC
100000A0B8040BAD                           My-host   Yes        Yes
  FC
1111111111111111                           testhost  No         No
  FC
iqn.1991-05.com.microsoft:myhost.domain    Server1   No         No
  iSCSI
------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:04:59)
```

Basetypes

- hosts
- status

See also

- create host
- delete host
- set host-name

show inquiry

Description Shows inquiry data for each controller module.

Syntax `show inquiry`

Output

- Product vendor name, product ID, and vendor ID.
- Management Controller firmware version and loader version.
- Storage Controller firmware version and loader version.
- Controller module serial number.
- Media Access Control (MAC) address.
- Network port IP address.

Example Show inquiry data for a system in which controller B is not installed:

```
# show inquiry
Product Information
-------------------
Vendor Name:
Product ID: model
SCSI Vendor ID: vendor

Inquiry Controller A
--------------------
Management Controller Code Version: L240R001
Management Controller Loader Code Version: 2.5
Storage Controller Code Version: T240R01
Storage Controller Loader Code Version: 23.008
Serial Number: SN
MAC Address: 00:C0:FF:29:41:60
IP Address: 10.134.1.100

Inquiry Controller B
--------------------
Management Controller Code Version: Not Present
Management Controller Loader Code Version: Not Present
Storage Controller Code Version: Not Present
Storage Controller Loader Code Version: Not Present
Serial Number: Not Present
MAC Address: Not Present
IP Address: Not Present

Success: Command completed successfully. (2012-01-18 15:05:25)
```

Basetypes

- inquiry
- status

See also

- versions

show iscsi-parameters

Description For iSCSI, shows system-wide iSCSI parameters.

Syntax

```
show iscsi-parameters
```

Output

`CHAP`
Whether Challenge-Handshake Authentication Protocol is enabled or disabled.

`Jumbo Frames`
Whether jumbo-frame support is enabled or disabled.

`iSNS`
Whether Internet Storage Name Service support is enabled or disabled.

`iSNS IP`
Address of the iSNS server.

`iSNS Alt IP`
Address of the alternate iSNS server.

`iSCSI Speed`
Whether host port link speed is set to auto-negotiate (`auto`) or to 1 Gbit/sec.

`iSCSI IP Version`
Whether iSCSI host port addresses use IPv4 or IPv6 format.

Example Show system-wide iSCSI parameters:

```
# show iscsi-parameters
iSCSI Parameters
----------------
CHAP: Disabled
Jumbo Frames: Disabled
iSNS: Disabled
iSNS IP: 0.0.0.0
iSNS Alt IP: 0.0.0.0
iSCSI Speed: auto
iSCSI IP Version: 4

Success: Command completed successfully. (2012-01-18 15:05:53)
```

Basetypes

- iscsi-parameters
- status

See also

- set iscsi-parameters

show job-parameters

Description Shows parameters for background vdisk scrub, partner firmware upgrade, and other jobs.

Syntax

```
show job-parameters
```

Output

`Vdisk Background Scrub`
Shows whether disks in vdisks are automatically checked for disk defects to ensure system health. The interval between background vdisk scrub finishing and starting again is 24 hours.

- `Disabled`: Background vdisk scrub is disabled. This is the default.
- `Enabled`: Background vdisk scrub is enabled.

`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 vdisk verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect vdisk background scrub, which always runs at “background” priority.)

- `High`: Utilities have higher priority than host I/O. This can cause heavy I/O to be slower than normal. 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.

Example Show a system’s job parameters:

```
# show job-parameters
Job Parameters
--------------
Vdisk Background Scrub: Disabled
Partner Firmware Upgrade: Enabled
Utility Priority: High

Success: Command completed successfully. (2012-01-18 15:07:25)
```

Basetypes

- job-parameters
- status

See also

- set job-parameters

show license

Description Shows the status of licensed features in the storage system.

Syntax `show license`

Output `License Key`

- The license key, if a license is installed and valid.
- `not installed`, if a license is invalid or is not installed.

`Maximum Licensable Snapshots`
Number of snapshots that the highest-level license allows.

`Base Maximum Snapshots`
Number of snapshots allowed without an installed license.

`Licensed Snapshots`
Number of snapshots allowed by the installed license.

`In-Use Snapshots`
Number of existing licensed snapshots.

`Snapshots Expire`

- `Never`. License is purchased and doesn't expire.
- Number of days remaining for a temporary license.
- `Expired`. Temporary license has expired and cannot be renewed.
- `Expired/Renewable`. Temporary license has expired and can be renewed.
- `N/A`. No license installed.

`Volume Copy`
Shows whether Volume Copy functions are enabled or disabled.

`Volume Copy Expires`

- `Never`. License is purchased and doesn't expire.
- Number of days remaining for a temporary license.
- `Expired`. Temporary license has expired and cannot be renewed.
- `Expired/Renewable`. Temporary license has expired and can be renewed.
- `N/A`. No license installed.

`Replication`
Shows whether AssuredRemote functions are enabled or disabled.

`Replication Expires`

- `Never`. License is purchased and doesn't expire.
- Number of days remaining for a temporary license.
- `Expired`. Temporary license has expired and cannot be renewed.
- `Expired/Renewable`. Temporary license has expired and can be renewed.
- `N/A`. No license installed.

`VDS`
Shows whether the VDS (Virtual Disk Service) Hardware Provider is enabled or disabled.

`VDS Expires`

- `Never`. License is purchased and doesn't expire.
- Number of days remaining for a temporary license.
- `Expired`. Temporary license has expired and cannot be renewed.
- `Expired/Renewable`. Temporary license has expired and can be renewed.
- `N/A`. No license installed.

`VSS`
Shows whether the VSS (Volume Shadow Copy Service) Hardware Provider is enabled or disabled.

`VSS Expires`

- `Never`. License is purchased and doesn't expire.
- Number of days remaining for a temporary license.
- `Expired`. Temporary license has expired and cannot be renewed.
- `Expired/Renewable`. Temporary license has expired and can be renewed.
- `N/A`. No license installed.

`SRA`
Shows whether Storage Replication Adapter (SRA) support is enabled or disabled.

`SRA Expires`

- `Never`. License is purchased and doesn't expire.
- Number of days remaining for a temporary license.
- `Expired`. Temporary license has expired and cannot be renewed.
- `Expired/Renewable`. Temporary license has expired and can be renewed.
- `N/A`. No license installed.

Example Show information about the installed license:

```
# show license
License Key: 0004b56810eb357d0f75d65c13c6e846
Maximum Licensable Snapshots: value
Base Maximum Snapshots: value
Licensed Snapshots: value
In-Use Snapshots: value
Snapshots Expire: 2 days remaining
Volume Copy: Enabled
Volume Copy Expires: Never
Replication: Enabled
Replication Expires: 2 days remaining
VDS: Enabled
VDS Expires: Never
VSS: Enabled
VSS Expires: Never
SRA: Enabled
SRA Expires: Never

Success: Command completed successfully. (2012-10-18 15:07:43)
```

Basetypes

- license
- status

show master-volumes

Description Shows information about all master volumes, or ones associated with a specified controller or snap pool.

Syntax

```
show master-volumes
    [controller a|b|both]
    [snap-pool volume]
```

Parameters

`controller a|b|both`
Optional. Shows master volumes owned by controller A only, by controller B only, or by either controller (`both`). If this parameter is omitted, master volumes owned by either controller are shown.

`snap-pool` *`volume`*
Optional. Only includes master volumes associated with the specified snap pool name or serial number. For volume syntax, see Command syntax on page 20.

Output

`Vdisk`
Vdisk name.

`Serial Number`
Master volume serial number.

`Name`
Master volume name.

`Size`
Total size of the master volume.

`Status`
Indicates whether the master volume is available or unavailable.

`Status-Reason`
Shows `---` for `Available` status, or a reason for `Unavailable` status:

- `MV Not Accessible`: Master volume is not accessible.
- `MV Not Found`: Master volume is not found.
- `RV`: Replication volume (either a primary volume or a secondary volume).
- `RV Prepared`: Replication-prepared volume, which could become a secondary volume in a replication set.
- `SP Not Accessible`: Snap pool is not accessible.
- `SP Not Found`: Snap pool is not found.
- `Unknown`

`Snap-pool Name`
Name of the associated snap pool.

`Snapshots`
Number of snapshots that exist for the master volume.

`Snap Data`
Amount of snap-pool space occupied by this master volume for its associated snapshots (preserved and write data).

`Rollback`
Either the percent complete if rollback is in progress, or `---` if rollback is not in progress.

Example Show information about all master volumes:

```
# show master-volumes
Vdisk Serial Number  Name  Size      Status       Status-Reason
  Snap-pool Name  Snapshots  Snap Data  Rollback
------------------------------------------------------------------------------
VD1   SN             MV1   14.9GB    Available    ---
  SP1             1          1090.5MB   ---
VD1   SN             MV2   9999.9MB  Unavailable  SP Not Accessible
  SP2             0          0B         0%
------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:08:06)
```

Basetypes

- master-volumes
- status

See also

- convert master-to-std
- create master-volume
- delete all-master-volumes
- delete master-volume
- expand volume
- rollback master-volume

show network-parameters

Description Shows the settings and health of each controller module's network port.

Syntax `show network-parameters`

Output `IP Address`
Network port IP address.

`Gateway`
Network port gateway IP address.

`Subnet Mask`
Network port IP subnet mask.

`MAC Address`
Controller's unique Media Access Control address.

`Addressing Mode`

- `Manual`: Network settings set manually (statically).
- `DHCP`: DHCP used to set network parameters.

`Link Speed`

- `Unknown`: Either the link speed has not been set, or it has been unset because the controller module was removed from its enclosure.
- `10mbps`: The network port link speed is set to 10 Mb/s.
- `100mbps`: The network port link speed is set to 100 Mb/s.

`Duplex Mode`

- `Undefined`: Either the duplex mode has not been set, or it has been unset because the controller module was removed from its enclosure.
- `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`

`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.

Example Show network parameters for a storage system using DHCP:

```
# show network-parameters
Network Parameters Controller A
-------------------------------
IP Address: 10.134.129.188
Gateway: 10.134.0.1
Subnet Mask: 255.255.0.0
MAC Address: value
Addressing Mode: DHCP
Link Speed: Unknown
Duplex Mode: Undefined
Auto Negotiation: Disabled
Health: OK
Health Reason:
Health Recommendation:

Network Parameters Controller B
-------------------------------
IP Address: 10.134.129.189
Gateway: 10.134.0.1
Subnet Mask: 255.255.0.0
MAC Address: value
Addressing Mode: DHCP
Link Speed: Unknown
Duplex Mode: Undefined
Auto Negotiation: Disabled
Health: OK
Health Reason:
Health Recommendation:

Success: Command completed successfully. (2012-10-29 15:09:03)
```

Show network parameters for a storage system using manual addressing:

```
# show network-parameters
Network Parameters Controller A
-------------------------------
IP Address: 172.22.1.200
Gateway: 172.22.1.1
Subnet Mask: 255.255.255.0
MAC Address: value
Addressing Mode: Manual
...

Network Parameters Controller B
-------------------------------
IP Address: 172.22.1.201
Gateway: 172.22.1.1
Subnet Mask: 255.255.255.0
MAC Address: value
Addressing Mode: Manual
...
```

Show network parameters for a storage system in which controller A is set to auto-negotiate at a link speed up to 100 MB/s in full-duplex mode with a connected Ethernet switch:

```
# show network-parameters
Network Parameters Controller A
-------------------------------
IP Address: 172.22.1.200
Gateway: 172.22.1.1
Subnet Mask: 255.255.255.0
MAC Address: value
Addressing Mode: Manual
Link Speed: 100mbps
Duplex Mode: Full
Auto Negotiation: Enabled
...

Network Parameters Controller B
-------------------------------
IP Address: 172.22.1.201
Gateway: 172.22.1.1
Subnet Mask: 255.255.255.0
MAC Address: value
Addressing Mode: Manual
Link Speed: Unknown
Duplex Mode: Undefined
Auto Negotiation: Disabled
...
```

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.

Syntax `show ntp-status`

Output `NTP Status`

- `activated`: NTP is enabled.
- `deactivated`: NTP is disabled.

`NTP Server Address`
NTP server IP address, or 0.0.0.0 if not set.

`Last Server Contact`
Date and time in the format *`year-month-day hour:minutes:seconds`* of the last message received from the NTP server; or none.

Example Show NTP status for the system:

```
# show ntp-status
NTP Status
----------
NTP Status: activated
NTP Server Address: 69.10.36.3
Last Server Contact: 2012-01-18 15:30:44

Success: Command completed successfully. (2012-01-18 15:39:41)
```

Basetypes

- ntp-status
- status

See also

- set controller-date

show ports

Description Shows information about host ports on both controllers. This command shows the same information as the show host-parameters command.

Syntax `show ports`

Output `Ports`
Controller ID and port number.

`Media`

- `FC(P)`: Fibre Channel Point-to-Point (public or private).
- `FC(L)`: Fibre Channel-Arbitrated Loop.
- `FC(-)`: Not applicable, as when the port is disconnected.
- `SAS`: Serial Attached SCSI.
- `iSCSI`: Internet SCSI.

`Target ID`
Port WWN or IQN.

`Status`
Whether the port is operational, has a problem, or is disconnected.

`Speed (A)`
Actual host-port link speed, or blank if not applicable.

`Speed (C)`
Configured host-port link speed:

- FC: `Auto`, `8Gb`, `4Gb`, or `2Gb` (Gbit/sec).
- iSCSI: `Auto` or `1Gb` (Gbit/sec).
- Blank if not applicable.

`Health`

- `OK`
- `Degraded`
- `Fault`
- `N/A`

`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.

`Topo (C)`
FC and SAS only. Configured topology.

`Width`
SAS only. Number of PHY lanes in the SAS port.

`PID`
FC only. Primary loop ID, or blank if not applicable.

`IP-Ver`
iSCSI only. IP version: IPv4 or IPv6.

`PIP`
iSCSI only. Primary IP address.

`PIP-Gateway`
iSCSI only. Primary gateway IP address.

PIP-Netmask
iSCSI only. Primary subnet mask IP address.

MAC
iSCSI only. Unique Media Access Control (MAC) hardware address, also called the physical address.

SIP
iSCSI only. Secondary IP address. This field is only displayed during failover.

SIP-Gateway
iSCSI only. Secondary gateway IP address. This field is only displayed during failover.

SIP-Netmask
iSCSI only. Secondary subnet mask IP address. This field is only displayed during failover.

MAC(S)
iSCSI only. Secondary MAC address. This field is only displayed during failover.

Example Show port information for a system with two FC ports:

```
# show ports
Ports Media    Target ID         Status        Speed(A) Speed(C)  Health
  Health Reason                Health Recommendation
-------------------------------------------------------------------------------
A0    FC(L)    WWPN              Up            8Gb      Auto      OK
  OK


   Topo(C) PID
   ------------
   Loop    0

A1    FC(-)    WWPN              Disconnected           Auto      N/A
  There is no host connection to this host port.  - No action is required.

   Topo(C) PID
   ------------
   Loop    0

-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:03:24)
```

Show port information for a system with two iSCSI ports:

```
# show ports
Ports Media   Target ID         Status        Speed(A) Speed(C)  Health
  Health Reason                 Health Recommendation
-------------------------------------------------------------------------------
A0    iSCSI   IQN               Up            1Gb      Auto      OK


   IP-Ver PIP          PIP-Gateway PIP-Netmask MAC
   ------------------------------------------------------------
   IPv4   10.134.9.100 10.134.0.1  255.255.0.0 00:C0:FF:29:00:24

A1    iSCSI   IQN               Disconnected          Auto      N/A
  There is no host connection to this host port.  - No action is required.

   IP-Ver PIP          PIP-Gateway PIP-Netmask MAC
   ------------------------------------------------------------
   IPv4   10.134.9.101 10.134.0.1  255.255.0.0 00:C0:FF:29:00:23

-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:03:55)
```

Show port information for a system with two SAS ports:

```
# show ports
Ports Media    Target ID         Status        Speed(A)  Health
  Health Reason                 Health Recommendation
-------------------------------------------------------------------------------
A0    SAS      WWPN              Up            Auto      OK


   Topo(C) Width
   --------------
   Direct  4

A1    SAS      WWPN              Disconnected  Auto      N/A
  There is no host connection to this host port.  - No action is required.

   Topo(C) Width
   --------------
   Direct  4

-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:04:10)
```

Basetypes

- port
- status

See also

- set host-parameters

show power-supplies

Description Shows information about each power supply in the storage system.

Syntax `show power-supplies`

Output `Encl`
Enclosure ID.

`Serial Number`
Power supply serial number.

`Name`
Power supply identifier and location.

`Health`

- `OK`
- `Degraded`
- `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.

Example Show power-supply information:

```
# show power-supplies
Encl  Serial Number  Name                Health   Health Reason
  Health Recommendation
------------------------------------------------------------------------------
0     SN             PSU 0, Left         OK

0     SN             PSU 1, Right        OK

------------------------------------------------------------------------------
Success: Command completed successfully. (2012-09-19 12:08:57)
```

Basetypes

- unhealthy-component
- power-supplies
- fan
- status

See also

- show fans
- show frus

show priorities

Description Shows snapshot-retention priorities for a specified snap pool. Snap-pool priorities, in conjunction with snapshot priorities, determine which snapshots are retained if system resource limitations require some snapshots to be automatically deleted.

Lower-priority snapshots will be deleted before higher-priority snapshots. Priority values are 0–65535.

Syntax `show priorities` *`snap-pool`*

Parameters *`snap-pool`*
Name or serial number of the snap pool.

Output `Attribute Name`

- `Standard Snapshot`
- `Volume Copy Snapshot`: A snapshot that is being used to copy data from a source volume to a destination volume. This attribute is temporary for the duration of the volume-copy process.
- `Replication Snapshot`
- `Replicating Snapshot`: A snapshot that is being replicated to a secondary volume. This snapshot is required in order to resume the replication. The attribute is temporary for the duration of the replication process.
- `Common Sync Point Snapshot`: The latest snapshot that is copy-complete on all secondary volumes. It identifies a common point in time that is known by all destinations.
- `Only Sync Point Snapshot`: The only sync point that is available on at least one secondary volume. If this snapshot is removed, then the next replication requires a full sync to be performed.
- `Queued Snapshot`: A snapshot that was taken for remote replication but is queued waiting for the previous replications to complete.
- `DRM Snapshot`: A temporary standard snapshot created from a replication snapshot for the purpose of doing a test failover for disaster recovery management (DRM).

`Priority`
Retention priority for the corresponding attribute.

Example Show priorities for snap-pool `SP1`:

```
# show priorities SP1
Attribute Name                  Priority
-----------------------------------------------
Standard Snapshot               0x6000 (default)
Volume Copy Snapshot            0xa000 (default)
Replication Snapshot            0x4000 (default)
Replicating Snapshot            0xc000 (default)
Common Sync Point Snapshot      0x8000 (default)
Only Sync Point Snapshot        0xe000 (default)
Queued Snapshot                 0x2000 (default)
DRM Snapshot                    0xb000 (default)
-----------------------------------------------
Success: Command completed successfully. (2012-01-18 15:11:03)
```

Basetypes

- attribute-priorities
- status

See also

- set priorities
- show snap-pools

show protocols

Description Shows which management services and protocols are enabled or disabled.

Syntax `show protocols`

Example Show the status of service and security protocols:

```
# show protocols
Service and Security Protocols
------------------------------
Web Browser Interface (HTTP): Enabled
Secure Web Browser Interface (HTTPS): Enabled
Command Line Interface (Telnet): Enabled
Secure Command Line Interface (SSH): Enabled
Storage Management Initiative Specification (SMI-S): Enabled
Unsecure Storage Management Initiative Specification (SMI-S 5988): Disabled
File Transfer Protocol (FTP): Disabled
Simple Network Management Protocol (SNMP): Enabled
Service Debug (Debug): Disabled
In-band SES Management (SES): Enabled
Success: Command completed successfully. (2012-01-18 15:13:23)
```

Basetypes

- security-communications-protocols
- status

See also

- set protocols

show redundancy-mode

Description Shows the redundancy status of the system.

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.
- `Fail 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.

`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.

Example From either controller, show the redundancy status of a dual-controller system where both controllers are operating:

```
# show redundancy-mode
System Redundancy
-----------------
Controller Redundancy Mode: Active-Active ULP
Controller Redundancy Status: Redundant
Controller A Status: Operational
Controller A Serial Number: SN
Controller B Status: Operational
Controller B Serial Number: SN

Success: Command completed successfully. (2012-01-18 11:02:36)
```

From either controller, show the redundancy status of a dual-controller system where controller B is down:

```
# show redundancy-mode
System Redundancy
-----------------
Controller Redundancy Mode: Fail Over
Controller Redundancy Status: Operational but not redundant
Controller A Status: Operational
Controller A Serial Number: SN
Controller B Status: Down
Controller B Serial Number: SN

Success: Command completed successfully. (2012-02-01 11:03:39)
```

From either controller, show the redundancy status of a dual-controller system where both controllers are down:

```
# show redundancy-mode
System Redundancy
-----------------
Controller Redundancy Mode: Down
Controller Redundancy Status: Down
Controller A Status: Down
Controller A Serial Number: SN
Controller B Status: Down
Controller B Serial Number: SN

Success: Command completed successfully. (2012-02-01 11:03:39)
```

Show the redundancy status of a single-controller system:

```
# show redundancy-mode
System Redundancy
-----------------
Controller Redundancy Mode: Single Controller
Controller Redundancy Status: Operational but not redundant
Controller A Status: Operational
Controller A Serial Number: SN
Controller B Status: Not installed
Controller B Serial Number: Not Available

Success: Command completed successfully. (2011-09-22 13:21:05)
```

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.

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.

Syntax `show remote-systems [system]`

Parameters *system*
Optional. Name or network-port IP address of a specific remote system.

Example Show information about remote system System2:

```
# show remote-systems System2
Remote System
-------------
System Name: System2
System Contact: J. Smith
System Location: Denver lab
System Information: Uninitialized Info
Vendor Name: vendor
Product ID: product
Product Brand: brand
IP Address Controller A: 10.122.1.21
IP Address Controller B: 10.122.1.22
Username: manage
Status: Connected
Last Connected: 2012-01-18 12:58:15

Success: Command completed successfully. (2012-01-18 15:14:23)
```

Basetypes
- remote-system
- status

See also
- create remote-system
- delete remote-system
- remote
- set remote-system

show replication-images

Description Shows information about replication images for a specified replication volume.

Syntax

```
show replication-images
    [set replication-set]
    [replication-volume]
```

Parameters

`set replication-set`
Optional. Name or serial number of the replication set.

`replication-volume`
Optional. Name or serial number of the replication volume. If the name is not unique within the replication set, the local volume is assumed. If the name is not unique across replication sets, specify the set parameter.

Output

Replication volume summary information:

`Name`
Replication volume name.

`Serial Number`
Replication volume serial number.

`Type`
Replication volume type:

- `Primary Volume`: The volume is the primary volume in a replication set.
- `Secondary Volume`: The volume is the secondary volume in a replication set.

Replication volume image information:

`Image Serial Number`
Replication image serial number.

`Image Name`
User-defined name assigned to the primary image.

`Snapshot Serial`
Replication snapshot serial number associated with the image. The replication snapshot is associated with the replication volume specified in the request.

`Snapshot Name`
Replication snapshot name associated with the image. For a secondary image, this value is not filled in until the replication is completed.

`Creation Date/Time`
Date and time when the replication image was created on the replication volume.

Information shown for secondary images, not primary images:

`Status`
Status of the replication image:

- `N/A`: The image information is not valid.
- `Queued`: The image is known to exist in the primary-view volume but replication has not started.
- `Replicating`: The image is being replicated.
- `Suspended`: The image is being replicated but replication is suspended.
- `Complete`: The image is created, fully replicated, and available.
- `Create-Snapshot`: The image is fully replicated but a snapshot of the image is being created.
- `Offline`: The image has been replicated but is unusable due to an error.

`Progress`
Percentage complete if the image is being replicated. Applies only to secondary volumes.

`Start Date/Time`
Date and time when replication started on the replication volume.

`Last Update`
Date and time when the image was last updated (either due to an ongoing replication operation or the replication being completed).

`Suspended`
Date and time when the image was suspended or resumed.

`Est Complete`
Estimated time when replication is expected to complete.

`Time [HH:MM:SS]`
Total time of replication (in hours, minutes, and seconds) including any suspension time.

Example Show information about replication images for replication set `rsvol1`:

```
# show replication-images rsvol1
Name       Serial Number  Type
-----------------------------------------------------------------
vd01_v001  SN             Primary Volume

   Image Serial Number  Image Name     Snapshot Serial  Snapshot Name
     Creation Date/Time
   ------------------------------------------------------------------------
   SN                   vd01_v001_i01  SN               vd01_v001_i01
     2012-01-18 14:24:33
   SN                   vd01_v001_i02  SN               vd01_v001_i02
     2012-01-18 14:25:33

rvd01_v001 SN             Secondary Volume

   Image Serial Number  Image Name     Snapshot Serial  Snapshot Name
     Creation Date/Time
   ------------------------------------------------------------------------
   SN                   vd01_v001_i01  SN               Snap12319447290
     2012-01-18 14:52:09

      Status    Progress  Start Date/Time      Last Update          Suspended
        Est Complete  Time [HH:MM:SS]
      ------------------------------------------------------------------------
      Complete  N/A       2012-01-18 14:24:34  2012-01-18 14:52:09  N/A
        N/A           00:27:35

   SN                   vd01_v001_i02  SN               Snap12319447530
     2012-01-17 14:52:33

      Status    Progress  Start Date/Time      Last Update          Suspended
        Est Complete  Time [HH:MM:SS]
      ------------------------------------------------------------------------
      Complete  N/A       2012-01-18 14:52:09  2012-01-18 14:52:33  N/A
        N/A           00:00:24

-----------------------------------------------------------------
Success: Command completed successfully. (2012-01-18 15:14:42)
```

Basetypes
- replication-volume-summary
- status

See also
- show replication-sets
- show replication-volumes

show replication-sets

Description Shows information about replication sets on the local system. You can view information about all replication sets or a specific replication set.

Syntax `show replication-sets [replication-set]`

Parameters `replication-set`
Optional. Name or serial number of a replication set or volume for which to display replication-set-level information. If this parameter is omitted, information is shown for all replication sets.

Output

Replication set information:

`Name`
Replication set name.

`Serial Number`
Replication set serial number.

Replication volume information:

`Name`
Replication volume name.

`Serial Number`
Replication volume serial number.

`Status`
Replication volume status: `Replicating`, `Suspended`, `Initializing`, `Inconsistent`, `Offline`, `Online`, or `Establishing proxy`. After a secondary volume is reattached it has `Establishing proxy` status while establishing a proxy connection with the remote (primary) system in preparation for replication.

`Status-Reason`
More information about the status value, or `N/A` for `Online` status.

`Monitor`
Replication volume monitoring status:

- `OK`: Communication to the remote volume is successfully occurring on the FC or iSCSI network.
- `Failed`: Communication to the remote volume has failed because of an FC or iSCSI network issue or because the remote volume has gone offline.

`Location`
Replication volume location: `Local` or `Remote`

`Primary-Volume`
Primary volume name. If the replication set has a primary-volume conflict, all associated primary volumes are displayed.

`Primary-Volume-Serial`
Primary volume serial number. If the replication set has a primary-volume conflict, all associated primary volumes are displayed.

`Primary-Volume-Status`
Primary volume status: `Online`, `Offline`, `Conflict`, or `N/A`

`MaxQueue`
Number of replication images to consider when determining the next image to replicate. Used only if the `On Collision` parameter is set to `Oldest`.

`MaxRetryTime`
Amount of time in seconds that the replication volume should retry a replication operation on any specific image when errors occur. Used only if the `On Error` parameter is set to `Retry`.

`On Error`
Error policy to invoke when errors occur during the replication process: `Retry` or `Suspend`.

`Link Type`
Type of ports used to link the primary and secondary volumes:

- `FC`: FC ports.
- `iSCSI`: iSCSI ports.

`On Collision`
Collision policy used to determine the next image to replicate when multiple replication images are queued: `Newest` or `Oldest`.

`Monitor Interval`
Interval in seconds at which the primary volume should query the secondary volume.

`Priority`
Priority of the replication process on the replication volume: `Low`, `Medium`, or `High`.

`Connection Status`

- `Not Attempted`: Communication has not been attempted to the remote volume.
- `Online`: The volumes in the replication set have a valid connection but communication is not currently active.
- `Active`: Communication is currently active to the remote volume.
- `Offline`: No connection is available to the remote system.

`Connection Time`
Date and time of the last communication with the remote volume, or `N/A`.

Remote link information:

`Connected Ports`

- For a remote primary or secondary volume, this field shows the IDs of up to two hosts ports in the local system that are connected to the remote system. If two ports are connected but only one is shown, this indicates that a problem is preventing half the available bandwidth from being used.
- For a local primary or secondary volume, this field shows N/A.

`Remote Address`
The address of each host port in the remote system through which the volume is accessible.

Example Show information about all replication sets:

```
# show replication-sets
Replication Set [Name (rsvd01_v001) Serial Number (SN) ] Primary Volume:
  Name       Serial Number  Status  Status-Reason  Monitor  Location
  Primary-Volume  Primary-Volume-Serial  Primary-Volume-Status  MaxQueue
  MaxRetryTime  On Error  Link Type  On Collision  Monitor Interval
  Priority  Connection Status  Connection Time
  ------------------------------------------------------------------------------
  vd01_v001  SN             Online  N/A            OK       Remote
  vd01_v001       SN                     Online                32
  1800          Retry     iSCSI      Oldest        300
  Medium     Online             2012-01-18 10:04:00

     Connected Ports  Remote Address
     ----------------------------------------------------------------
     A1               IP=10.134.9.46:3260
                      IP=10.134.9.47:3260
                      IP=10.134.9.48:3260
     A1               IP=10.134.9.49:3260
```

```
  rvd01_v001 SN             Online  N/A            OK       Local
  vd01_v001       SN                    Online                 32
  1800          Retry     iSCSI      Oldest        300
  Medium    Not Attempted      N/A

     Connected Ports  Remote Address
     ----------------------------------------------------------------
     N/A              IP=10.134.9.40:3260
     N/A              IP=10.134.9.41:3260
     N/A              IP=10.134.9.42:3260
     N/A              IP=10.134.9.43:3260

Replication Set [Name (rsData) Serial Number (SN) ] Primary Volume:
  Name       Serial Number  Status  Status-Reason  Monitor  Location
  Primary-Volume  Primary-Volume-Serial  Primary-Volume-Status  MaxQueue
  MaxRetryTime  On Error  Link Type  On Collision  Monitor Interval
  Priority  Connection Status  Connection Time
  ------------------------------------------------------------------------------
  rData      SN             Online  N/A            OK       Remote
  Data            SN                    Online                 32
  1800         Retry      FC         Oldest        300
  Medium    Online             2012-01-18 10:33:38

     Connected Ports  Remote Address
     ----------------------------------------------------------------
     A1               FCPortWWN=207000c0ff000991
                      FCPortWWN=217000c0ff000991
                      FCPortWWN=247000c0ff000991
     A1               FCPortWWN=257000c0ff000991

  Data       SN             Online  N/A            OK       Local
  Data            SN                    Online                 32
  1800          Retry     FC         Oldest        300
  Medium    Not Attempted      N/A

     Connected Ports  Remote Address
     ----------------------------------------------------------------
     N/A              FCPortWWN=207000c0ff000bee
     N/A              FCPortWWN=217000c0ff000bee
     N/A              FCPortWWN=247000c0ff000bee
     N/A              FCPortWWN=257000c0ff000bee

Success: Command completed successfully. (2012-01-18 15:15:03)
```

Basetypes

- replication-set
- status

See also

- show replication-images
- show replication-volumes

show replication-volumes

Description Shows information about volumes in replication sets. You can view information about all replication volumes, volumes in a specified replication set, or a specified replication volume.

Syntax
```
show replication-volumes
    [set replication-set]
    [replication-volume]
```

Parameters

`set replication-set`
Optional. Name or serial number of the replication set.

`replication-volume`
Optional. Name or serial number of the replication volume. If the name is not unique within the replication set, the local volume is assumed. If the name is not unique across replication sets, specify the `set` parameter.

Output **Replication volume information:**

`Name`
Replication volume name.

`Serial Number`
Replication volume serial number.

`Status`
Replication volume status:

- `Initializing`: The initial (full) replication to the volume is in progress.
- `Online`: The volume is online and is consistent with the last replicated image.
- `Inconsistent`: The volume is online but is in an inconsistent state. A full replication is required to initialize it.
- `Replicating`: The volume is online and replication is in progress.
- `Replicate-delay`: The volume is online but the in-progress replication has been temporarily delayed; a retry is occurring.
- `Suspended`: The volume is online but the in-progress replication has been suspended.
- `Offline`: The volume can be accessed but is unusable due to an error.
- `Establishing proxy`: The volume is establishing a proxy connection to a remote volume. This will occur when a detached secondary volume is reattached and is re-establishing a connection with the primary system in preparation for replication.
- `Detached`: The volume is detached for removal.

`Status-Reason`
More information about the status value, or `N/A` for `Online` status.

`Monitor`
Replication volume monitoring status:

- `OK`: Communication to the remote volume is successfully occurring on the iSCSI network.
- `Failed`: Communication to the remote volume has failed because of an iSCSI communication issue or because the remote volume has gone offline.

`Location`
Replication volume location: `Local` or `Remote`.

`Primary-Volume`
Primary volume name. If the replication set has a primary-volume conflict, all associated primary volumes are displayed.

`Primary-Volume-Serial`
Primary volume serial number. If the replication set has a primary-volume conflict, all associated primary volumes are displayed.

`Primary-Volume-Status`
Primary volume status: `Online`, `Offline`, `Conflict`, or `N/A`.

`MaxQueue`
Maximum number of replication images to consider when determining the next image to replicate. Used only if the `On Collision` parameter is set to `Oldest`. The default is 32.

`MaxRetryTime`
Maximum amount of time in seconds that the replication volume should retry a replication operation on any specific image when errors occur. Used only if the `On Error` parameter is set to `Retry`. The default is 1800.

`On Error`
Error policy to invoke when errors occur during the replication process:

- `Retry`: Retry the replication for the time specified by the `MaxRetryTime` value. This is the default.
- `Suspend`: Suspend the replication until the error is resolved automatically or through user intervention.

`Link Type`
Type of ports used to link the primary and secondary volumes:

- `FC`: FC ports.
- `iSCSI`: iSCSI ports.

`On Collision`
Collision policy used to determine the next image to replicate when multiple replication images are queued:

- `Newest`: Only the latest replication image should be considered for the next replication operation.
- `Oldest`: Only the latest *n* replication images should be considered for the next replication operation, where *n* is defined by the `MaxQueue` value and the oldest of these images should be considered first. This is the default.

`Monitor Interval`
Interval in seconds at which the primary volume should query the secondary volume. The default is 300.

`Priority`
Priority of the replication process on the replication volume:

- `High`: Replication has higher priority than host I/O. This can cause heavy I/O to be slower than normal. This is the default.
- `Medium`: Replication performance is balanced with host I/O performance.
- `Low`: Replication runs at a slower rate with minimal effect on host I/O. Use when streaming data without interruption is more important than data redundancy.

`Connection Status`

- `Not Attempted`: Communication has not been attempted to the remote volume.
- `Online`: The volumes in the replication set have a valid connection but communication is not currently active.
- `Active`: Communication is currently active to the remote volume.
- `Offline`: No connection is available to the remote system.

`Connection Time`
Date and time of the last communication with the remote volume, or `N/A`.

Remote link information:

`Connected Ports`

- For a remote primary or secondary volume, this field shows the IDs of up to two hosts ports in the local system that are connected to the remote system. If two ports are connected but only one is shown, this indicates that a problem is preventing half the available bandwidth from being used.
- For a local primary or secondary volume, this field shows `N/A`.

`Remote Address`
The address of each host port in the remote system through which the volume is accessible.

Example Show information about all replication volumes:

```
# show replication-volumes
Name        Serial Number  Status  Status-Reason  Monitor  Location
  Primary-Volume  Primary-Volume-Serial  Primary-Volume-Status  MaxQueue
  MaxRetryTime  On Error  Link Type  On Collision  Monitor Interval
  Priority  Connection Status  Connection Time
------------------------------------------------------------------------------
vd01_v001   SN             Online  N/A            OK       Remote
  vd01_v001       SN                     Online                 32
  1800          Retry     iSCSI      Oldest        300
  Medium      Online             2018-01-18 10:04:00

   Connected Ports  Remote Address
   ---------------------------------------------------------------
   A1               IP=10.134.9.46:3260
                    IP=10.134.9.47:3260
                    IP=10.134.9.48:3260
   A1               IP=10.134.9.49:3260

rvd01_v001  SN             Online  N/A            OK       Local
  vd01_v001       SN                     Online                 32
  1800          Retry     iSCSI      Oldest        300
  Medium      Not Attempted      N/A

   Connected Ports  Remote Address
   ---------------------------------------------------------------
   N/A              IP=10.134.9.40:3260
   N/A              IP=10.134.9.41:3260
   N/A              IP=10.134.9.42:3260
   N/A              IP=10.134.9.43:3260

Success: Command completed successfully. (2012-01-18 15:16:46)
```

Basetypes

- replication-volume
- status

See also

- set replication-volume-parameters
- show replication-sets

show sas-link-health

Description Shows the condition of SAS expansion-port connections.

Syntax `show sas-link-health`

Output `Encl`
Enclosure ID.

`Ctlr`
ID of the controller module or expansion module.

`Name`

- `Out Port`: Egress (expansion) port on controller module or an expansion module. Can be connected to an ingress port on an expansion module.
- `In Port`: Ingress port on an expansion module. Can be connected to an egress (expansion) port on a controller module or an expansion module.

`Status`

- `Up`
- `Disconnected`
- `Not Present`
- `Warning`
- `Error`
- `Unknown`

`Health`

- `OK`
- `Degraded`
- `Fault`
- `N/A`
- `Unknown`

Example Show the condition of SAS port connections in a two-enclosure system:

```
# show sas-link-health
Encl     Ctlr     Name                 Status               Health
  Health Reason  Health Recommendation
------------------------------------------------------------------------------
0        A        Out Port             Up                   OK
0        B        Out Port             Up                   OK
------------------------------------------------------------------------------
Encl     Ctlr     Name                 Status               Health
  Health Reason
  Health Recommendation
------------------------------------------------------------------------------
1        A        Out Port             Disconnected         N/A
  No drive enclosure is connected to this expansion port. This is normal if
  this is the last (or only) enclosure in the cabling sequence of the system.
  - No action is required.
1        A        In Port              Up                   OK


1        B        Out Port             Disconnected         N/A
  No drive enclosure is connected to this expansion port. This is normal if
  this is the last (or only) enclosure in the cabling sequence of the system.
  - No action is required.
1        B        In Port              Up                   OK


------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-19 10:10:13)
```

Basetypes

- expander-ports
- status

show schedule-details

Description Shows information about a specified task schedule.

Syntax `show schedule-details` *schedule*

Parameters *schedule*
Schedule name.

Example Show information about task schedule `SnapSched`:

```
# show schedule-details SnapSched
Schedule Details
----------------
Schedule Name: SnapSched
Schedule Specification: Start 2011-10-19 23:47:00, Every 3 Minutes
Status: Ready
Next Time: 2011-10-23 12:59:00
Task To Run: Snap
Error Message:

  Tasks
  -----
  Task Name: Snap
  Task Type: TakeSnapshot
  Status: Ready
  Task State: Start
  Error Message:

    Task Details
    ------------
    Source Volume: VD1_V1
    Source Volume Serial: SN
    Prefix: VD1_V1
    Count: 4
    Last Created: VD1_V1_S0001

      Snapshot Name        Snapshot Serial
      ------------------------------------------------------
      VD1_V1_S0001         SN

Success: Command completed successfully. (2011-10-10 15:25:34)
```

Basetypes
- schedules
- status

See also
- create schedule
- delete schedule
- show schedules

show schedules

Description Shows information about all task schedules.

Syntax `show schedules`

Example Show information about all task schedules:

```
# show schedules
Schedule Details
----------------
Schedule Name: SnapSched
Schedule Specification: Start 2011-10-19 23:47:00, Every 3 Minutes
Status: Ready
Next Time: 2011-10-19 23:47:00
Task To Run: Snap
Error Message:

  Tasks
  -----
  Task Name: Snap
  Task Type: TakeSnapshot
  Status: Ready
  Task State: Start
  Error Message:

    Task Details
    ------------
    Source Volume: VD1_V1
    Source Volume Serial: SN
    Prefix: VD1_V1
    Count: 4
    Last Created: VD1_V1_S0001

      Snapshot Name        Snapshot Serial
      -----------------------------------------------------
      VD1_V1_S0001         SN


Schedule Name: bTx_v002_sched1
Schedule Specification: Start 2011-10-03 11:13:00, Every 1 Hours, Count 30
Status: Expired
Next Time: 2011-10-04 17:13:00
Task To Run: bTx_v002_task001
Error Message:

  Tasks
  -----
  Task Name: bTx_v002_task001
  Task Type: ReplicateVolume
  Status: Ready
  Task State: Start
  Error Message:

    Task Details
    ------------
    Primary Volume Name: bTx_v002
    Primary Volume Serial Number: SN
    Prefix: bTx_v002_01
    Mode: new-snapshot
```

```
Count: 10
Last Created: bTx_v002_01_R0030
Last Used Snapshot: N/A

  Snapshot Name        Snapshot Serial
  ------------------------------------------------------
  bTx_v002_01_R0021    SN
  bTx_v002_01_R0022    SN
  bTx_v002_01_R0023    SN
  bTx_v002_01_R0024    SN
  bTx_v002_01_R0025    SN
  bTx_v002_01_R0026    SN
  bTx_v002_01_R0027    SN
  bTx_v002_01_R0028    SN
  bTx_v002_01_R0029    SN
  bTx_v002_01_R0030    SN

Success: Command completed successfully. (2011-10-10 15:20:05)
```

Basetypes

- schedules
- status

See also

- create schedule
- delete schedule
- show schedule-details

show sensor-status

Description Shows the status of each environmental sensor in each enclosure.

Information shown only for a controller enclosure: on-board temperature, disk controller temperature, memory controller temperature, super-capacitor voltage and charge, overall unit (enclosure) status.

Information shown for all enclosures: temperature, voltage, and current for each IOM (controller module or expansion module); temperature, voltage, and current for each PSU (power supply).

Normal and error ranges for temperature and voltage are specified in the Setup Guide.

Syntax `show sensor-status`

Output `Encl`
Enclosure number.

`Sensor Name`
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.
- `Error`: 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.

Example Show sensor status for a system that includes a controller enclosure and a drive enclosure:

```
# show sensor-status
Encl Sensor Name                       Value    Status
------------------------------------------------------------
0    On-Board Temperature 1-Ctlr A     49 C     OK
0    On-Board Temperature 1-Ctlr B     43 C     OK
0    On-Board Temperature 2-Ctlr A     62 C     OK
0    On-Board Temperature 2-Ctlr B     56 C     OK
0    On-Board Temperature 3-Ctlr A     48 C     OK
0    On-Board Temperature 3-Ctlr B     46 C     OK
0    Disk Controller Temp-Ctlr A       27 C     OK
0    Disk Controller Temp-Ctlr B       26 C     OK
0    Memory Controller Temp-Ctlr A     67 C     OK
0    Memory Controller Temp-Ctlr B     58 C     OK
0    Capacitor Pack Voltage-Ctlr A     8.22     OK
```

```
0    Capacitor Pack Voltage-Ctlr B     8.26     OK
0    Capacitor Cell 1 Voltage-Ctlr A   2.04     OK
0    Capacitor Cell 1 Voltage-Ctlr B   2.06     OK
0    Capacitor Cell 2 Voltage-Ctlr A   2.04     OK
0    Capacitor Cell 2 Voltage-Ctlr B   2.06     OK
0    Capacitor Cell 3 Voltage-Ctlr A   2.08     OK
0    Capacitor Cell 3 Voltage-Ctlr B   2.06     OK
0    Capacitor Cell 4 Voltage-Ctlr A   2.05     OK
0    Capacitor Cell 4 Voltage-Ctlr B   2.09     OK
0    Capacitor Charge-Ctlr A           99%      OK
0    Capacitor Charge-Ctlr B           99%      OK
0    Overall Unit Status               Error    Error
0    Temperature Loc: upper-IOM A      35 C     OK
0    Temperature Loc: lower-IOM B      27 C     OK
0    Temperature Loc: left-PSU         21 C     OK
0    Temperature Loc: right-PSU        34 C     OK
0    Voltage 12V Loc: upper-IOM A      11.92    OK
0    Voltage 5V Loc: upper-IOM A       5.10     OK
0    Voltage 12V Loc: lower-IOM B      11.98    OK
0    Voltage 5V Loc: lower-IOM B       5.10     OK
0    Voltage 12V Loc: left-PSU                  Error
0    Voltage 5V Loc: left-PSU                   Error
0    Voltage 3.3V Loc: left-PSU                 Error
0    Voltage 12V Loc: right-PSU        12.49    OK
0    Voltage 5V Loc: right-PSU         5.58     OK
0    Voltage 3.3V Loc: right-PSU       3.60     OK
0    Current 12V Loc: upper-IOM A      4.42     OK
0    Current 12V Loc: lower-IOM B      4.42     OK
0    Current 12V Loc: left-PSU                  Error
0    Current 5V Loc: left-PSU                   Error
0    Current 12V Loc: right-PSU        0.00     OK
0    Current 5V Loc: right-PSU         0.00     OK
-------------------------------------------------------------
Encl Sensor Name                       Value    Status
-------------------------------------------------------------
1    Temperature Loc: upper-IOM A      21 C     OK
1    Temperature Loc: lower-IOM B      20 C     OK
1    Temperature Loc: left-PSU         19 C     OK
1    Temperature Loc: right-PSU        20 C     OK
1    Voltage 12V Loc: upper-IOM A      11.92    OK
1    Voltage 5V Loc: upper-IOM A       5.08     OK
1    Voltage 12V Loc: lower-IOM B      11.92    OK
1    Voltage 5V Loc: lower-IOM B       5.08     OK
1    Voltage 12V Loc: left-PSU         11.97    OK
1    Voltage 5V Loc: left-PSU          5.09     OK
1    Voltage 3.3V Loc: left-PSU        3.51     OK
1    Voltage 12V Loc: right-PSU        12.02    OK
1    Voltage 5V Loc: right-PSU         5.11     OK
1    Voltage 3.3V Loc: right-PSU       3.50     OK
1    Current 12V Loc: upper-IOM A      0.25     OK
1    Current 12V Loc: lower-IOM B      0.25     OK
1    Current 12V Loc: left-PSU         4.13     OK
1    Current 5V Loc: left-PSU          3.67     OK
1    Current 12V Loc: right-PSU        4.25     OK
1    Current 5V Loc: right-PSU         3.58     OK
-------------------------------------------------------------
Success: Command completed successfully. (2012-01-19 16:17:11)
```

Basetypes

- sensors
- status

show shutdown-status

Description Shows whether each Storage Controller is active or shut down.

Syntax `show shutdown-status`

Output Message stating whether each controller is up (active), down (shut down), or not installed.

Example Show the shutdown status of each controller:

```
# show shutdown-status
Storage Controller A up
Storage Controller B down

Success: Command completed successfully. (2011-10-10 15:26:37)
```

Basetypes

- shutdown-status
- status

See also

- restart
- shutdown

show snap-pools

Description Shows information about snap pools owned by a specified controller or both controllers.

Syntax `show snap-pools [controller a|b|both]`

Parameters `controller a|b|both`
Optional. Shows snap pools owned by controller A only, by controller B only, or by either controller (`both`). If this parameter is omitted, all snap pools owned by either controller are shown.

Output `Vdisk`
Vdisk name.

`Serial Number`
Snap pool serial number.

`Name`
Snap pool name.

`Size`
Total size of the snap pool volume.

`Free`
Amount of free space available in this snap pool.

`Master Volumes`
Number of master volumes associated with this snap pool.

`Snapshots`
Number of snapshots using this snap pool.

`Status`

- `Available`: The snap pool is available for use.
- `Offline`: The snap pool is not available for use, as in the case where its disks are not present.
- `Corrupt`: The snap pool's data integrity has been compromised; the snap pool can no longer be used.

`Threshold`
Snap pool threshold level:

- `Warning`: The snap pool is moderately full. When this threshold is reached, an event is generated to alert the administrator. The default is 75%.
- `Error`: The snap pool is nearly full and unless corrective action is taken, snapshot data loss is probable. When this threshold is reached, an event is generated to alert the administrator and the associated snap-pool policy is triggered. The default is 90%.
- `Critical`: The snap pool is 98% full and data loss is imminent. When this threshold is reached, an event is generated to alert the administrator and the associated snap-pool policy is triggered.

`%Usage`
Threshold value (percent of snap pool space used) that triggers the threshold's policy.

`Policy`
Recovery policy to invoke when threshold value is reached:

- `autoexpand`: Try to expand the snap pool by the `SizeToExpand` value. If the snap pool's space usage reaches the percentage specified by its error threshold, the system will log Warning event 230 and will try to expand the snap pool by the snap pool's `SizeToExpand` value (below).
  - If the snap pool is successfully expanded, the system will log Informational event 444.
  - If the snap pool cannot be expanded because there is not enough available space in its vdisk, the system will log Warning event 444 and will automatically delete the oldest snapshot that is not a current sync point.

  Each time the snap-pool's error threshold is reached and the system cannot auto-expand the vdisk, the oldest remaining snapshot that is not a current sync point will be deleted. This behavior occurs for each snap pool independently, based on its space usage.
- `deleteoldestsnapshot`: Delete the oldest snapshot.
- `deletesnapshots`: Delete all snapshots.
- `haltwrites`: Halt writes to the snap pool.
- `notifyonly`: Generates an event to notify the administrator.

`SizeToExpand`

- *`size`*: For the `autoexpand` policy, the size by which to automatically expand the snap pool when the threshold is reached.
- `N/A`: The policy is not set to `autoexpand`.

Example Show information for snap pools owned by controller A:

```
# show snap-pools controller a
Vdisk  Serial Number  Name  Size      Free      Master Volumes  Snapshots
  Status
------------------------------------------------------------------------
R5     SN             SP1   5368.7MB  4265.6MB  1               2
  Available
     Threshold  %Usage   Policy                  SizeToExpand
     ---------------------------------------------------------
     Warning    75%      Notify Only             N/A
     Error      90%      Auto Expand             10.7GB
     Critical   98%      Delete Snapshots        N/A
------------------------------------------------------------------------
Success: Command completed successfully. (2011-10-10 15:27:07)
```

Basetypes

- snap-pools
- status

See also

- create snap-pool
- delete snap-pool
- expand snap-pool
- set snap-pool-policy
- set snap-pool-threshold

show snapshots

Description Shows information about snapshots for a specified controller, master volume, or snap pool. If no parameters are specified, information about all snapshots is shown.

Syntax

```
show snapshots
    [controller a|b|both]
    [master-volume volume]
    [snap-pool volume]
    [type standard|replication|all]
```

Parameters

`controller a|b|both`
Optional. Shows snapshots owned by controller A only, by controller B only, or by either controller (`both`). If this parameter is omitted, snapshots owned by either controller are shown.

`master-volume` *`volume`*
Optional. Shows snapshots associated with the specified master volume name or serial number. For volume syntax, see Command syntax on page 20.

`snap-pool` *`volume`*
Optional. Shows snapshots associated with the specified snap pool name or serial number. For volume syntax, see Command syntax on page 20.

`type standard|replication|all`
Optional. Shows only standard (non-replication) snapshots, only replication snapshots, or snapshots of all types. If this parameter is omitted, snapshots of all types are shown.

Output

`Vdisk`
Vdisk name.

`Serial Number`
Snapshot serial number.

`Name`
Snapshot name.

`Creation Date/Time`
Date and time the snapshot was prepared or committed.

`Status`

- `Available`
- `Unavailable`: See the `Status-Reason` value.

`Status-Reason`
Shows `N/A` for `Available` status, or one of the following reasons for `Unavailable` status:

- `MV Not Accessible`: Master volume is not accessible.
- `MV Not Found`: Master volume is not found.
- `SP Not Accessible`: Snap pool is not accessible.
- `SP Not Found`: Snap pool is not found.
- `SS Pending`: Snapshot is pending.
- `VC-MD In Progress`: Volume-copy with modified data is in progress.
- `RB-MD In Progress`: Rollback with modified data is in progress.

`Source Volume`
Name of the volume that the snapshot was taken of.

`Snap-pool Name`
Snap pool name.

`Snap Data`
Total amount of preserved and write data associated with the snapshot.

`Unique Data`
Amount of preserved and write data that is unique to the snapshot.

`Shared Data`
Amount of preserved and write data that is shared between this snapshot and other snapshots.

`Priority`
Retention priority for the snapshot, based on the snapshot attributes and the user-defined retention priority for the snapshot type.

`User Priority`
User-defined retention priority for the snapshot type.

`Type`

- `Standard snapshot`: Snapshot of a master volume.
- `Standard snapshot(DRM)`: A temporary standard snapshot created from a replication snapshot for the purpose of doing a test failover for disaster recovery management (DRM).
- `Replication snapshot`: For a primary or secondary volume, a snapshot that was created by a replication operation but is not a sync point.
- `Replication snapshot(Replicating)`: For a primary volume, a snapshot that is being replicated to a secondary system.
- `Replication snapshot(Current sync point)`: For a primary or secondary volume, the latest snapshot that is copy-complete on any secondary system in the replication set.
- `Replication snapshot(Common sync point)`: For a primary or secondary volume, the latest snapshot that is copy-complete on all secondary systems in the replication set.
- `Replication snapshot(Old Common sync point)`: For a primary or secondary volume, a common sync point that has been superseded by a new common sync point.
- `Replication snapshot(Only sync point)`: For a primary or secondary volume, the only snapshot that is copy-complete on any secondary system in the replication set.
- `Replication snapshot(Queued)`: For a primary volume, a snapshot associated with a replication operation that is waiting for a previous replication operation to complete.
- `Replication snapshot(Awaiting replicate)`: For a primary volume, a snapshot that is waiting to be replicated to a secondary system.

Example Show information about snapshots associated with snap pool `spvd03_v001`:

```
# show snapshots snap-pool spvd03_v001
Vdisk  Serial Number  Name           Creation Date/Time   Status
    Status-Reason  Source Volume  Snap-pool Name  Snap Data  Unique Data
    Shared Data  Priority  User Priority
    Type
  ------------------------------------------------------------------------------
  vd01   SN             vd01_v003_i02  2012-01-19 12:51:18  Available
    N/A            vd01_v003      spvd01_v003     1075.1MB   1075.1MB
    0B           0xc000    0x0000
    Replication snapshot(Replicating)
  vd01   SN             vd01_v003_i01  2012-01-17 12:48:57  Available
    N/A            vd01_v003      spvd01_v003     1074.6MB   1074.6MB
    0B           0xe000    0x0000
    Replication snapshot(Only sync point)(Current sync point)(Common sync
    point)
  vd03   SN             vd03_V1_s001   2012-01-17 15:23:19  Available
    N/A            vd03_V1        spvd03_V1       352.8MB    352.8MB
    0B           0x6000    0x0000
    Standard snapshot
  ------------------------------------------------------------------------------
  Success: Command completed successfully. (2012-01-19 15:27:33)
```

Basetypes

- snapshots
- status

See also

- show master-volumes
- show snap-pools

show snmp-parameters

Description Shows SNMP settings for event notification.

Syntax `show snmp-parameters`

Output `SNMP Trap Notification Level`

- `crit`: Only Critical events are sent as traps.
- `error`: Error and Critical events are sent as traps.
- `warn`: Warning, Error, and Critical events are sent as traps.
- `info`: All events are sent as traps.
- `none`: No events are sent as traps and traps are disabled.

`SNMP Trap Host IP#`
IP address of each trap host.

`SNMP read community`
Community string for read-only access (not shown to Monitor users).

`SNMP write community`
Community string for write access (not shown to Monitor users).

Example Show SNMP notification settings:

```
# show snmp-parameters
SNMP Trap Notification Level: crit
SNMP Trap Host IP1: 172.22.4.171
SNMP Trap Host IP2: 0.0.0.0
SNMP Trap Host IP3: 0.0.0.0
SNMP read community: public
SNMP write community: private

Success: Command completed successfully. (2012-01-19 15:27:59)
```

Basetypes

- snmp-parameters
- status

See also

- set snmp-parameters
- set protocols
- show protocols

show system

Description Shows information about the system. If the system's health is not `OK`, each unhealthy component is listed with information to help you resolve the health problem.

Syntax `show system`

Output `System Name`
Storage system name. The default is `Uninitialized Name`.

`System Contact`
The name of person who administers the system. The default is `Uninitialized Contact`.

`System Location`
The location of the system. The default is `Uninitialized Location`.

`System Information`
A brief description of what the system is used for or how it's configured. The default is `Uninitialized Info`.

`Midplane Serial Number`
The serial number of the controller enclosure midplane.

`Vendor Name`
Vendor name.

`Product ID`
Product model identifier.

`Product Brand`
Product brand name.

`SCSI Vendor ID`
Vendor name returned by the SCSI INQUIRY command.

`SCSI Product ID`
Product identifier returned by the SCSI INQUIRY command.

`Enclosure Count`
Number of enclosures in the storage system.

`Health`

- `OK`
- `Degraded`
- `Fault`
- `Unknown`

`Health Reason`
If Health is not `OK`, this field shows the reason for the health state.

`Supported Locales`
Supported display languages: English, Spanish, French, German, Italian, Japanese, Dutch, Chinese-Simplified, Chinese-Traditional, Korean.

Example Show information for a system whose health is OK:

```
# show system
System Information
------------------
System Name: Storage-1
System Contact: J. Smith
System Location: Main lab
System Information: Used for order processing data
System Information: 10g iSCSI
Midplane Serial Number: SN
Vendor Name: vendor
Product ID: product
Product Brand: brand
SCSI Vendor ID: vendor-ID
SCSI Product ID: product-ID
Enclosure Count: 2
Health: OK
Health Reason:
Supported Locales: English, Spanish, French, German, Italian, Japanese, Dutch,
Chinese-Simplified, Chinese-Traditional, Korean

Success: Command completed successfully. (2011-10-10 15:28:14)
```

Show information for a system whose health is degraded because of a problem with a vdisk:

```
# show system
System Information
------------------
System Name: Storage-2
System Contact: J. Smith
System Location: Main lab
System Information: Used for testing
Midplane Serial Number: SN
Vendor Name: vendor
Product ID: product
Product Brand: brand
SCSI Vendor ID: vendor-ID
SCSI Product ID: product-ID
Enclosure Count: 1
Health: Degraded
Health Reason: See the information about unhealthy components for guidance.
Supported Locales: English, Spanish, French, German, Italian, Japanese, Dutch,
Chinese-Simplified, Chinese-Traditional, Korean

  Unhealthy Component
  -------------------
  Component ID: Vdisk vd01
  Health: Degraded
  Health Reason: The vdisk is not fault tolerant. Reconstruction cannot start
  because there is no spare disk available of the proper type and size.
  Health Recommendation: - Replace the failed disk.
  - Configure the new disk as a spare so the system can start reconstructing the
  vdisk.
  - To prevent this problem in the future, configure one or more additional disks
  as spare disks.

Success: Command completed successfully. (2012-01-19 10:37:52)
```

Basetypes
- system
- unhealthy-component
- status

See also
- set system

show system-parameters

Description Shows the current settings for the storage system.

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 vdisk 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.

`Number of Host Ports`
Number of host-interface ports in the controller enclosure.

`Maximum Disks`
Number of disks that the system supports.

`Maximum Volumes`
Number of volumes that the system supports.

`Maximum Vdisks`
Number of vdisks that the system supports.

`Maximum LUNs`
Number of LUNs that the system supports.

`Maximum Vdisks Per Controller`
Number of vdisks that each controller supports.

`Local Controller`
ID of the controller you are accessing.

`Serial Number`
Last six digits of the midplane serial number.

Example Show current settings for the storage system:

```
# show system-parameters
System Parameters
-----------------
ULP Enabled: true
Number of Host Ports: value
Maximum Disks: value
Maximum Volumes: value
Maximum Vdisks: value
Maximum LUNs: value
Maximum Vdisks Per Controller: value
Local Controller: A
Serial Number: SN

Success: Command completed successfully. (2012-01-19 15:28:32)
```

Basetypes
- system-parameters-table
- status

See also
- set volume
- set vdisk

show task-details

Description Shows information about a specified task.

Syntax `show task-details task`

Parameters *task*
Task name.

Output

For a TakeSnapshot task:

`Task Name`
Task name.

`Task Type`
`TakeSnapshot`

`Status`

- `Uninitialized`: Task is not yet ready to run
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task:

- `Start`
- `VerifyVolume`
- `ValidateLicensingLimit`
- `CreateName`
- `CreateSnap`
- `VerifySnap`
- `InspectRetention`
- `FindOldestSnap`
- `UnmapSnap`
- `ResetSnap`
- `RenameSnap`

`Error Message`
Message if an error occurred while processing the task, or blank.

`Source Volume`
Standard or master volume name.

`Source Volume Serial`
Volume serial number.

`Prefix`
Label that identifies snapshots created by this task. Snapshot names have the format *prefix*`_s#`, where `#` starts at `001`.

`Count`
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`
Name of the last snapshot created by the task, or blank.

`Snapshot Name`
Name of each snapshot taken, or blank.

`Snapshot Serial`
Serial number of each snapshot taken, or blank.

For a ResetSnapshot task:

`Task Name`
Task name.

`Task Type`
`ResetSnapshot`.

`Status`

- `Uninitialized`: Task is not yet ready to run.
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task:

- `Start`
- `VerifySnap`
- `UnmapSnap`
- `ResetSnap`

`Error Message`
Message if an error occurred while processing the task, or blank.

`Snapshot Name`
Name of the snapshot to reset.

`Snapshot Serial Number`
Serial number of the snapshot to reset.

For a VolumeCopy task:

`Task Name`
Task name.

`Task Type`
`VolumeCopy`

`Status`

- `Uninitialized`: Task is not yet ready to run.
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task:

- `Start`
- `VerifyVolume`
- `CreateName`
- `ObtainMap`
- `UnmapVolume`
- `CreateVolume`
- `RemapVolume`
- `VerifyCreatedVolume`

`Error Message`
Message if an error occurred while processing the task, or blank.

`Source Volume`
Name of the volume to be copied.

`Source Volume Serial`
Serial number of the volume to be copied.

`Destination Vdisk`
Name of the destination vdisk.

`Destination Vdisk Serial`
Serial number of the destination vdisk.

`Prefix`
Label that identifies copies created by this task. Volume names have the format *`prefix_c#`*, where `#` starts at `001`.

`Modified Data`

- `modified`: The copy includes modified snapshot data.
- `preserved`: The copy excludes modified snapshot data.

`Last Created`
Name of the last volume created by the task, or blank.

For a ReplicateVolume task:

`Task Name`
Task name.

`Task Type`
`ReplicateVolume`

`Status`

- `Uninitialized`: Task is not yet ready to run.
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task:

- `Start`
- `VerifyVolume`
- `CreateName`
- `RepVolume`
- `VerifySnap`

`Error Message`
Message if an error occurred while processing the task, or blank

`Primary Volume Name`
Name of the volume to replicate.

`Primary Volume Serial Number`
Serial number of the volume to replicate.

`Prefix`
Label that identifies copies created by this task. Volume names have the format *`prefix_c#`*, where `#` starts at `001`.

`Mode`

- `new-snapshot`: Replicate a new snapshot of the primary volume.
- `last-snapshot`: Replicate the last (most recent existing) snapshot of the primary volume.

`Last Created`
Name of the last volume created by the task, or blank.

`Last Used Snapshot`
For a task whose replication mode is `last-snapshot`, the name of the last snapshot used for replication; otherwise, `N/A`.

For an EnableDSD task:

`Task Name`
Task name, which must be `taskDSDresume`

`Task Type`
`EnableDSD`

`Status`

- `Uninitialized`: Task is not yet ready to run.
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task; always `Start`

`Error Message`
Message if an error occurred while processing the task, or blank.

For a DisableDSD task:

`Task Name`
Task name, which must be `taskDSDsuspend`

`Task Type`
`DisableDSD`

`Status`

- `Uninitialized`: Task is not yet ready to run.
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task; always `Start`

`Error Message`
Message if an error occurred while processing the task, or blank.

Example Show information about task `Snap`:

```
# show task-details Snap
Tasks
-----
Task Name: Snap
Task Type: TakeSnapshot
Status: Ready
Task State: Start
Error Message:

  Task Details
  ------------
  Source Volume: MV
  Source Volume Serial: SN
  Prefix: MV
  Count: 1
  Last Created: MV_S0001

    Snapshot Name        Snapshot Serial
    -----------------------------------------------------
    MV_S0001             SN

Success: Command completed successfully. (2012-10-19 15:28:33)
```

Basetypes

- tasks
- status

See also

- create schedule
- create task
- delete task
- set task
- show schedule-details
- show schedules
- show tasks

show tasks

Description Shows information about all tasks.

Syntax `show tasks`

Output **For a TakeSnapshot task:**

`Task Name`
Task name.

`Task Type`
`TakeSnapshot`

`Status`

- `Uninitialized`: Task is not yet ready to run.
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task:

- `Start`
- `VerifyVolume`
- `ValidateLicensingLimit`
- `CreateName`
- `CreateSnap`
- `VerifySnap`
- `InspectRetention`
- `FindOldestSnap`
- `UnmapSnap`
- `ResetSnap`
- `RenameSnap`

`Error Message`
Message if an error occurred while processing the task, or blank.

`Source Volume`
Standard or master volume name.

`Source Volume Serial`
Volume serial number.

`Prefix`
Label that identifies snapshots created by this task. Snapshot names have the format *`prefix`*`_s#`, where `#` starts at `001`.

`Count`
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`
Name of the last snapshot created by the task, or blank.

`Snapshot Name`
Name of each snapshot taken, or blank.

`Snapshot Serial`
Serial number of each snapshot taken, or blank.

For a ResetSnapshot task:

`Task Name`
Task name

`Task Type`
`ResetSnapshot`

`Status`

- `Uninitialized`: Task is not yet ready to run.
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task:

- `Start`
- `VerifySnap`
- `UnmapSnap`
- `ResetSnap`

`Error Message`
Message if an error occurred while processing the task, or blank.

`Snapshot Name`
Name of the snapshot to reset.

`Snapshot Serial Number`
Serial number of the snapshot to reset.

For a VolumeCopy task:

`Task Name`
Task name.

`Task Type`
`VolumeCopy`

`Status`

- `Uninitialized`: Task is not yet ready to run.
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task:

- `Start`
- `VerifyVolume`
- `CreateName`
- `ObtainMap`
- `UnmapVolume`
- `CreateVolume`
- `RemapVolume`
- `VerifyCreatedVolume`

`Error Message`
Message if an error occurred while processing the task, or blank.

`Source Volume`
Name of the volume to be copied.

`Source Volume Serial`
Serial number of the volume to be copied.

`Destination Vdisk`
Name of the destination vdisk.

`Destination Vdisk Serial`
Serial number of the destination vdisk.

`Prefix`
Label that identifies copies created by this task. Volume names have the format *`prefix_c#`*, where `#` starts at `001`.

`Modified Data`

- `modified`: The copy includes modified snapshot data.
- `preserved`: The copy excludes modified snapshot data.

`Last Created`
Name of the last volume created by the task, or blank.

For a ReplicateVolume task:

`Task Name`
Task name.

`Task Type`
`ReplicateVolume`

`Status`

- `Uninitialized`: Task is not yet ready to run.
- `Ready`: Task is ready to run.
- `Active`: Task is running.
- `Error`: Task has an error.
- `Invalid`: Task is invalid.

`Task State`
Current step of the task:

- `Start`
- `VerifyVolume`
- `CreateName`
- `RepVolume`
- `VerifySnap`

`Error Message`
Message if an error occurred while processing the task, or blank.

`Primary Volume`
Name of the volume to replicate.

`Primary Volume Serial Number`
Serial number of the volume to replicate.

`Prefix`
Label that identifies snapshots created by this task. Volume names have the format *`prefix_c#`*, where `#` starts at `001`.

Mode

- new-snapshot: Replicate a new snapshot of the primary volume.
- last-snapshot: Replicate the most recent existing snapshot of the primary volume.

Last Created
Name of the last volume created by the task, or blank.

Last Used Snapshot
For a task whose replication mode is last-snapshot, the name of the last snapshot used for replication; otherwise, N/A

For an EnableDSD task:

Task Name
Task name, which must be taskDSDresume

Task Type
EnableDSD

Status

- Uninitialized: Task is not yet ready to run.
- Ready: Task is ready to run.
- Active: Task is running.
- Error: Task has an error.
- Invalid: Task is invalid.

Task State
Current step of the task; always Start

Error Message
Message if an error occurred while processing the task, or blank.

For a DisableDSD task:

Task Name
Task name, which must be taskDSDsuspend

Task Type
DisableDSD

Status

- Uninitialized: Task is not yet ready to run.
- Ready: Task is ready to run.
- Active: Task is running.
- Error: Task has an error.
- Invalid: Task is invalid.

Task State
Current step of the task; always Start

Error Message
Message if an error occurred while processing the task, or blank.

Example Show information about all tasks:

```
# show tasks
Tasks
-----
Task Name: Snap
Task Type: TakeSnapshot
Status: Ready
Task State: Start
Error Message:

  Task Details
  ------------
  Source Volume: MV
  Source Volume Serial: SN
  Prefix: MV
  Count: 1
  Last Created: MV_S0001

    Snapshot Name        Snapshot Serial
    ------------------------------------------------------
    MV_S0001             SN


Task Name: Reset
Task Type: ResetSnapshot
Status: Ready
Task State: Start
Error Message:

  Task Details
  ------------
  Snapshot Name: VD1_V1_S0001
  Snapshot Serial Number: SN


Task Name: Copy
Task Type: VolumeCopy
Status: Ready
Task State: Start
Error Message:

  Task Details
  ------------
  Source Volume: VD1_V1
  Source Volume Serial: SN
  Destination Vdisk: VD2
  Destination Vdisk Serial: SN
  Prefix: C
  Modified Data: modified
  Last Created:
```

```
Task Name: Replicate
Task Type: ReplicateVolume
Status: Ready
Task State: Start
Error Message:

  Task Details
  ------------
  Primary Volume Name: VD1_V2
  Primary Volume Serial Number: SN
  Prefix: VD1_V2
  Mode: new-snapshot
  Count: 1
  Last Created: MV_S0001
  Last Used Snapshot:

    Snapshot Name        Snapshot Serial
    ------------------------------------------------------
    MV_S0001             SN


Task Name: taskDSDresume
Task Type: EnableDSD
Status: Ready
Task State: Start
Error Message:


Task Name: taskDSDsuspend
Task Type: DisableDSD
Status: Ready
Task State: Start
Error Message:

Success: Command completed successfully. (2012-01-19 15:28:52)
```

Basetypes

- tasks
- status

See also

- create schedule
- create task
- delete task
- set task
- show schedule-details
- show schedules
- show task-details

show unwritable-cache

Description Shows the percentage of unwritable data in the system. 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.

Syntax `show unwritable-cache`

Example Show the percentage of unwritable cache data in the system:

```
# show unwritable-cache
Unwritable System Cache
-----------------------
Percent of unwritable cache in controller A: 0
Percent of unwritable cache in controller B: 0

Success: Command completed successfully. (2012-01-19 15:30:50)
```

Basetypes

- unwritable-cache

See also

- clear cache

show users

Description Shows configured user accounts.

Syntax `show users [user]`

Input *user*
`Optional. User name to show settings for.`

Output `Username`
User name.

`Roles`

- `monitor`: View-only access to selected user interfaces.
- `manage`: Modify access to selected user interfaces.

`User Type`
The user's experience level: `Novice`, `Standard`, `Advanced`, or `Diagnostic`. All user types have access to all commands.

`User Locale`
Display language for this user. The default is English.

`WBI`

- `x`: The user can access the web-browser interface. This is the default.
- (blank): The user cannot access this interface.

`CLI`

- `x`: The user can access the command-line interface. This is the default.
- (blank): The user cannot access this interface.

`FTP`

- `x`: The user can access the file transfer protocol interface.
- (blank): The user cannot access this interface. This is the default.

`SMI-S`

- `x`: The user can access the Storage Management Initiative Specification (SMI-S) interface.
- (blank): The user cannot access this interface. This is the default.

`SNMP`

- `U`: The user can access the SNMPv3 interface and view the MIB.
- `T`: The user can access the SNMPv3 interface and receive trap notifications.
- (blank): The user cannot access this interface. This is the default.

`Authentication Type`

- `MD5`: MD5 authentication.
- `SHA`: SHA (Secure Hash Algorithm) authentication.
- `none`: No authentication.

`Privacy Type`

- `DES`: Data Encryption Standard.
- `AES`: Advanced Encryption Standard.
- `none`: No encryption.

`Password`
User password. For a standard user the password is represented by eight asterisks. For an SNMPv3 user this is the authentication password; it is shown in clear text for reference when configuring users in the corresponding management application.

`Privacy Password`
Encryption password for an SNMPv3 user whose privacy type is set to `DES` or `AES`. The password is shown in clear text for reference when configuring users in the corresponding management application.

`Trap Host`
SNMP trap destination for an SNMPv3 user that can receive trap notifications.

Example Show configured users:

```
# show users
Username  Roles           User Type  User Locale  WBI  CLI  FTP  SMI-S  SNMP
  Authentication Type  Privacy Type  Password      Privacy Password
  Trap Host Address
------------------------------------------------------------------------------
ftp       manage,monitor  Standard   English               x
                                     ********
MIB       monitor         Standard   English                           U
  SHA                 AES            access_MIB    MIB_access
manage    manage,monitor  Standard   English      x    x    x    x
                                     ********
monitor   monitor         Standard   English      x    x
                                     ********
Traps     monitor         Standard   English                           T
  SHA                 AES            _Abc123_      _123Abc_
  172.22.4.171
Rivera    manage,monitor  Standard   Spanish      x         x
                                     ********
------------------------------------------------------------------------------
Success: Command completed successfully. (2012-02-19 15:31:12)
```

Basetypes
- users
- status

See also
- create user
- delete user
- set user

show vdisks

Description Shows information for all or specified vdisks.

Syntax

```
show vdisks
    [vdisks]
    [perf]
```

Parameters

vdisks
Optional. Names or serial numbers of the vdisks to show information about. For vdisk syntax, see Command syntax on page 20.

perf
Optional. Shows performance statistics from the latest historical sample for each vdisk (aggregated from its member disks). Statistics shown include total amount of data transferred and average bytes per second.

Output

Name
Vdisk name.

Size
Vdisk size.

Free
Vdisk free space.

Own
Either the preferred owner during normal operation or the partner controller when the preferred owner is offline.

Pref
Controller that owns the vdisk and its volumes during normal operation.

RAID
Vdisk RAID level.

Disks
Number of disks in the vdisk.

Spr
Number of spares assigned to the vdisk.

Chk

- For RAID levels except NRAID, RAID 1, and RAID 50, the configured chunk size for the vdisk.
- For NRAID and RAID 1, chunk-size has no meaning and is therefore shown as not applicable (N/A).
- For RAID 50, the vdisk chunk size calculated as: *configured-chunk-size* x (*subvdisk-members* - 1). For a vdisk configured to use 32-KB chunk size and 4-disk subvdisks, the value would be 96k (32KB x 3).

`Status`

- `CRIT`: Critical. The vdisk is online but isn't fault tolerant because some of its disks are down.
- `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.
- `OFFL`: Offline. Either the vdisk 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 vdisk 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 vdisk is QTCR or QTDN, the vdisk is automatically dequarantined.
- `QTDN`: Quarantined with a down disk. The RAID-6 vdisk has one inaccessible disk. The vdisk is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the vdisk is QTCR or QTDN, the vdisk is automatically dequarantined.
- `QTOF`: Quarantined offline. The vdisk is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 vdisk.
- `STOP`: The vdisk is stopped.
- `UNKN`: Unknown.
- `UP`: Up. The vdisk is online and does not have fault-tolerant attributes.

`Jobs`
Shows whether a job is running and its percent complete.

- `DRSC`: The disk is being scrubbed.
- `EXPD`: The vdisk is being expanded.
- `INIT`: The vdisk is initializing.
- `RCON`: The vdisk is being reconstructed.
- `VRFY`: The vdisk is being verified.
- `VRSC`: The vdisk 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`
Vdisk serial number.

`Drive Spin Down`

- `Disabled`: DSD is disabled for the vdisk. This is the default.
- `Enabled - all spinning`: DSD is enabled for the vdisk.
- `Partial spin-down`: DSD is enabled for the vdisk and its disks are partially spun down to conserve power.
- `Full spin-down`: DSD is enabled for the vdisk and its disks are fully spun down to conserve power.

`Spin Down Delay`
The period of inactivity after which the vdisk's disks and dedicated spares automatically spin down, from 1–360 minutes.

`Data Transferred`
If the `perf` parameter is specified, this field shows the total amount of data read and written since the last sampling time.

Total Bps
If the perf parameter is specified, this field shows the data transfer rate, in bytes per second, since the last sampling time.

Health

- OK
- Degraded
- 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.

Example Show information for all vdisks:

```
# show vdisks
Name  Size     Free     Own  Pref  RAID    Disks  Spr  Chk   Status  Jobs
  Job%  Serial Number  Drive Spin Down         Spin Down Delay  Health
  Health Reason  Health Recommendation
-------------------------------------------------------------------------------
VD1   587.1GB  116.7GB  B    B     RAID50  6      0    64k   FTOL    VRSC
  41%   SN             Disabled               0                OK

VD2   146.5GB  95.7GB   A    A     RAID0   2      0    64k   UP
        SN             Enabled - all spinning  15               OK

VD3   900.1GB  900.1GB  B    B     RAID1   2      0    N/A   OFFL    INIT
  2%    SN             Disabled               0                OK

-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-19 15:31:35)
```

Show information for all vdisks, with performance statistics fields:

```
# show vdisks perf
Name  Size     Free     Own  Pref  RAID    Disks  Spr  Chk   Status  Jobs
  Job%  Serial Number  Drive Spin Down         Spin Down Delay
  Data Transferred  Total Bps  Health  Health Reason  Health Recommendation
-------------------------------------------------------------------------------
vd01  587.4GB  587.4GB  A    A     RAID5   5      0    64k   FTOL
        SN             Disabled               0
  25.6MB            28.1KB     OK
...
-------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-19 15:31:50)
```

Basetypes

- virtual-disks
- status

See also

- create vdisk
- delete vdisks
- expand vdisk
- set vdisk

show vdisk-statistics

Description Shows live or historical performance statistics for vdisks. You can view live statistics for all or specified vdisks, or historical statistics for a specified vdisk. The system samples disk-performance statistics every quarter hour and retains performance 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 vdisk 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 vdisk that contains the volume, the vdisk's statistics are adjusted.

Properties shown only in XML API format are described in XML API basetype properties on page 341.

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.

Syntax To show live statistics:

```
show vdisk-statistics [vdisks]
```

To show historical statistics:

```
show vdisk-statistics
   vdisk
   historical
   [time-range "date/time-range"]
   [count number-of-data-samples]
   [all]
```

Parameters *vdisks*
Optional. Identifies one or more vdisks to show live statistics for. If this parameter is omitted, statistics will be shown for all vdisks. For vdisk syntax, see Command syntax on page 20.

vdisk
Identifies one vdisk to show historical statistics for. For vdisk syntax, see Command syntax on page 20.

`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.

count *number-of-data-samples*
Optional. Specifies the number of data samples to display, from 1–100. 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.

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.

Output (Live)

Name
Vdisk name.

Serial Number
Vdisk serial number.

Bytes per second
Data transfer rate 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.

Number of Reads
Number of read operations since these statistics were last reset or since the controller was restarted.

Number of 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.

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.

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.

Output (Historical)

Name
Vdisk name.

Serial Number
Vdisk serial number.

`Data Transferred`
Total amount of data read and written since the last sampling time.

`Data Read`
Shown by the `all` parameter. Amount of data read since the last sampling time.

`Data Written`
Shown by the `all` parameter. Amount of data written since the last sampling time.

`Total Bps`
Data transfer rate, in bytes per second, since the last sampling time. This is the sum of `Read Bps` and `Write Bps`.

`Read Bps`
Shown by the `all` parameter. Data transfer rate, in bytes per second, for read operations since the last sampling time.

`Write Bps`
Shown by the `all` parameter. Data transfer rate, in bytes per second, for write operations since the last sampling time.

`Sample Time`
Date and time, in the format *`year-month-day hour:minutes:seconds`*, when the data sample was taken.

Example Show live statistics for vdisks `VD1` and `MyVdisk`:

```
# show vdisk-statistics VD1,MyVdisk
Name     Serial Number  Bytes per second  IOPS  Number of Reads
  Number of Writes  Data Read  Data Written  I/O Resp Time  Read Resp Time
  Write Resp Time  Reset Time
------------------------------------------------------------------------------
VD1      SN             22.0MB            82    6179839
  10507038          478.8GB    1024.4GB      156240         12699
  240665          2011-01-17 08:15:01
MyVdisk  SN             22.1MB            78    4872260
  9913102           539.3GB    1044.1GB      79033          16405
  109815          2012-01-17 21:01:20
------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-19 16:25:26)
```

Show historical statistics from a specified date and time range for vdisk `VD2`:

```
# show vdisk-statistics VD2 historical time-range "start 2012-01-18 4:40 PM
end 2011-01-18 5:00 PM"
Name  Serial Number
----------------------------------------
VD2   SN

   Data Transferred     Total Bps     Sample Time
   ------------------------------------------------------------------------
   30.5GB               33.9MB        2012-01-18 17:00:00
   31.5GB               35.0MB        2012-01-18 16:45:00
----------------------------------------
Success: Command completed successfully. (2012-01-19 12:32:51)
```

Show all historical statistics (the latest 100 samples) for vdisk VD2:

```
# show vdisk-statistics VD2 historical all
Name  Serial Number
-----------------------------------------
VD2   SN

   Data Transferred  Data Read  Data Written  Total Bps  Read Bps  Write Bps
     Sample Time
   ------------------------------------------------------------------------
   44.8GB            22.4GB     22.4GB        49.8MB     24.9MB    24.9MB
     2012-01-19 11:30:00
   ...
-----------------------------------------
Success: Command completed successfully. (2012-01-19 12:35:06)
```

Basetypes

- vdisk-statistics (live)
- virtual-disk-summary (historical)
- status

See also

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

show versions

See versions.

show volumecopy-status

Description Shows information about in-progress volume copy operations. While a volume copy is in progress, the destination volume cannot be accessed.

Syntax `show volumecopy-status [controller a|b|both]`

Parameters

`controller a|b|both`
Optional. Shows volume copy operations for volumes owned by controller A only, by controller B only, or by either controller (`both`). If this parameter is omitted, all volume copy operations are shown.

Output

`VC Volume Name`
Destination volume name.

`Serial Number`
Destination volume serial number.

`Vdisk`
Destination vdisk name.

`Source Volume`
Source volume name.

`Progress`
Percent complete of the volume copy.

`Status`

- `Unavailable`: A volume copy is in progress to the destination volume.
- `Suspended`: The source volume went offline while a volume copy was in progress. When the source volume comes back online, the copy process resumes from the point where it stopped.

`Status-Reason`
More information about the `Status` value.

Example Show information about volume copies in progress for controller A:

```
# show volumecopy-status controller a
VC Volume Name  Serial Number  Vdisk  Source Volume  Progress  Status
  Status-Reason
------------------------------------------------------------------------------
MV1-copy        SN             VD1    MV1            7%        Unavailable
  VC In Progress
------------------------------------------------------------------------------
Success: Command completed successfully. (2011-10-10 15:33:30)
```

Basetypes

- volume-copy-status
- status

See also

- abort volumecopy
- volumecopy

show volume-maps

Description Shows mapping information for a specified volume or for all volumes.

Syntax `show volume-maps [volume]`

Parameters *volume*
Optional. Name or serial number of the volume to show mappings for. For volume syntax, see Command syntax on page 20. If this parameter is omitted, information for all volumes is shown.

Output `Serial Number`
Volume serial number.

`Name`
Volume name.

`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. This is the default.
- `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`

- FC and SAS: Host WWPN.
- iSCSI: Host initiator node name (typically the IQN).
- `all other hosts` for the volume's default mapping.

`Nickname`
Host nickname, or blank if not set or for `all other hosts`

Example Show all volume mappings:

```
# show volume-maps
Volume View [Serial Number (SN) Name (v1) ] Mapping:
  Ports       LUN   Access       Host-Port-Identifier Nickname
  ------------------------------------------------------------
  A0,A1,B0,B1 501   read-write   all other hosts

Volume View [Serial Number (SN) Name (v2) ] Mapping:
  Ports  LUN   Access       Host-Port-Identifier Nickname
  -----------------------------------------------------
  A1,B1  101   read-write   207000c0ff001121     Host2
  A1     100   read-only    207000c0ff001122     Host1
               not-mapped   all other hosts

Success: Command completed successfully. (2012-01-19 15:33:50)
```

Basetypes

- volume-view
- status

See also

- show host-maps
- show hosts
- show volumes

show volume-names

Description Shows volume names and serial numbers. This reduced form of the show volumes command is optimized for seeking basic volume information from a remote system.

Syntax `show volume-names [volumes]`

Parameters *volumes*
Optional. Names or serial numbers of the volumes to show information about. For volume syntax, see Command syntax on page 20. If this parameter is omitted, information is shown for all volumes.

Output `Name`
Name of the volume.

`Serial Number`
Volume serial number.

Example Show volume names and serial numbers:

```
# show volume-names
Name        Serial Number
------------------------
Data        SN
Data_s001   SN
spData      SN
vd1_v1      SN
------------------------
Success: Command completed successfully. (2012-01-19 15:34:14)
```

Basetypes
- volume-names
- status

See also
- show volume-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.

Syntax `show volume-reservations all|volumes`

Parameters `all|volumes`
Specifies all volumes, or the names or serial numbers of specific volumes. For volume syntax, Command syntax on page 20.

Output `Name`
Name of the volume.

`Serial Number`
Volume serial number.

`Volume Reserved`

- `Free`: The volume is not reserved.
- `Reserved`: The volume has been reserved by a host.

`Host ID`
Host WWPN or iSCSI node name.

`Port`
Controller ID and port number.

`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.

Example Show reservations for all volumes:

```
# show volume-reservations all
Name       Serial Number  Volume Reserved
  Host ID

  Port  Reservation Type
------------------------------------------------------------------------------
vd04_v001  SN             Free

        Undefined

vd04_v002  SN             Reserved
  iqn.1991-05.com.microsoft:andiamo

  A3    Exclusive Access
------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-19 08:58:28)
```

See also

- release volume
- show volumes

show volumes

Description Shows volume information for all or specified vdisks.

Syntax

```
show volumes
    [vdisk vdisks]
    [class standard|ptsnap]
    [type snap-pool|mastervolume|snapshot|standard|primary-volume
    |secondary-volume|replication-volume]
    [volumes]
```

Parameters

`vdisk` *`vdisks`*
Optional. Names or serial numbers of the vdisks containing the volumes to show. For vdisk syntax, see Command syntax on page 20.

`class standard|ptsnap`
Optional. Specifies the class of volumes to show.

`type snap-pool|mastervolume|snapshot|standard|primary-volume |secondary-volume|replication-volume`
Optional. Specifies the type of volumes to show. The `replication-volume` option shows primary and secondary volumes.

`volumes`
Optional. Names or serial numbers of volumes to show information about. For volume syntax, see Command syntax on page 20.

Output

`Vdisk`
Name of the vdisk.

`Name`
Name of the volume.

`Size`
Volume size.

`Serial Number`
Volume serial number.

`WR Policy`
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 default and 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 Opt`
Cache optimization mode:

- `standard`: Optimizes cache for both sequential and random reads. Appropriate for applications that read and write small files in random order, such as transaction-based and database update applications. This is the default.
- `no-mirror`: When this mode is enabled, each controller stops mirroring its cache metadata to the partner controller. This improves write I/O response time but at the risk of losing data during a failover. ULP behavior is not affected, with the exception that during failover any write data in cache will be lost.

`Read Ahead Size`
Read-ahead cache setting:

- `Disabled`: Read-ahead caching is disabled.
- `Default`: One chunk for the first access in a sequential read and one stripe for all subsequent accesses.
- `Maximum`: Maximum read-ahead size calculated by the controller.
- `64 KB`, `128 KB`, `256 KB`, `512 KB`, `1 MB`, `2 MB`, `4 MB`, `8 MB`, `16 MB`, or `32 MB`: Size selected by a user.

`Type`

- `standard`: Standard volume.
- `standard*`: Destination of an in-progress volume copy and cannot be mounted/presented/mapped until the copy is complete.
- `snap-pool`: Snap-pool volume.
- `master volume`: Master volume.
- `snapshot`: Snapshot volume.
- `replication source`: Source for an in-progress replication to a secondary volume.
- `unknown`: Unknown.

`Class`

- `standard`: Standard volume, not enabled for snapshots.
- `PTSNAP`: Snapshot-related volume such as a master volume, snap pool, or snapshot.
- `Proxy`: Destination of an in-progress replication from a remote volume, which when complete will change to type `snapshot`.

`Qualifier`

- `N/A`: Non-replication-specific volume such as a standard volume, master volume, snapshot, or snap pool.
- `RSR`: Replication-specific volume, such as a primary volume, secondary volume, replication snapshot, or replication image.
- `RSR (DRM Promoted Secondary)`: During an actual site failover (not a test failover), the replication set's primary and secondary volumes are shown as primary volumes with a primary-volume conflict. This qualifier enables host-based Storage Replication Adapter (SRA) software to determine which volume is the failed-over secondary volume for disaster recovery management (DRM). If both systems are online and the communication link between them is up, both systems will show similar information. When the SRA completes a restore-replication or reverse-replication operation, this volume will be shown as a secondary volume with the `RSR` qualifier.

`Volume Description`

- Blank if not set.

`WWN`
World Wide Name of the volume, used by host-based Storage Replication Adapter (SRA) software to identify the volume.

`Health`

- `OK`
- `Degraded`
- `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.

Example Show volume information for standard volumes only:

```
# show volumes type standard
Vdisk  Name  Size    Serial Number  WR Policy   Cache Opt  Read Ahead Size
  Type         Class      Qualifier  Volume Description  WWN
  Health  Health Reason  Health Recommendation
------------------------------------------------------------------------
VD1    V1    20.0GB  SN             write-back  standard   Default
  standard     standard   N/A                             WWN
  OK
------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-19 15:34:46)
```

Show volume information for vdisk `VD1` only:

```
# show volumes vdisk VD1
Vdisk  Name  Size    Serial Number  WR Policy   Cache Opt  Read Ahead Size
  Type         Class      Qualifier  Volume Description  WWN
  Health  Health Reason  Health Recommendation
------------------------------------------------------------------------
VD1    V1    35.9GB  SN             write-back  standard   Default
  standard     standard   N/A                             WWN
  OK
VD1    V2    35.9GB  SN             write-back  standard   Default
  master volumePTSNAP     RSR                             WWN
  OK
VD1    V3    35.9GB  SN             write-back  standard   Default
  snap-pool    PTSNAP     N/A                             WWN
  OK
VD1    V4    35.9GB  SN             write-back  standard   Default
  snapshot     PTSNAP     N/A                             WWN
  OK
------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-19 15:34:57)
```

Basetypes

- volumes
- status

See also

- create volume
- delete volumes
- expand volume
- set volume
- show vdisks
- show volume-maps

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.

Properties shown only in XML API format are described in XML API basetype properties on page 341.

Syntax `show volume-statistics [volumes]`

Parameters *volumes*
Optional. Names or serial numbers of the volumes to show information about. For volume syntax, see Command syntax on page 20. If this parameter is omitted, information is shown for all volumes.

Output Name
Volume name.

Serial Number
Volume serial number.

Bytes per second
Data transfer rate 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.

Number of Reads
Number of read operations since these statistics were last reset or since the controller was restarted.

Number of 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.

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.

Example Show statistics for volume vd1_v001:

```
# show volume-statistics vd1_v001
Name      Serial Number  Bytes per second  IOPS  Number of Reads
  Number of Writes  Data Read  Data Written  Reset Time
------------------------------------------------------------------------------
vd1_v001  SN             5696.0KB          236   44091454
  60342344          1133.0GB   1378.9GB      2012-01-20 10:14:54
------------------------------------------------------------------------------
Success: Command completed successfully. (2012-01-20 12:44:50)
```

Basetypes
- volume-statistics
- status

See also

- reset all-statistics
- reset volume-statistics
- show controller-statistics
- show disk-statistics
- show host-port-statistics
- show vdisk-statistics
- show volumes

shutdown

Description Shuts down the Storage Controller in a controller module. This ensures that a proper failover sequence is used, which includes stopping all I/O operations and writing any data in write cache to disk. If the Storage Controller in each controller module is shut down, hosts cannot access the system's data. Perform a shut down before removing a controller module or powering down the system.

△ **CAUTION:** You can continue to use the CLI when either or both Storage Controllers are shut down, but information shown might be invalid.

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.

Example Shut down the Storage Controller in controller A:

```
# shutdown a
Info: Shutting down SC a...
Success: Command completed successfully. (2012-01-19 12:42:23)
```

See also

- restart
- show shutdown-status

start vdisk

Description Restarts a vdisk that was stopped in order to move its disks into this system.

Starting a vdisk is part of the process for moving a secondary volume from a primary system into a secondary system. The process to move a secondary volume is:

1. In the system where the secondary volume resides:
   a. Detach the secondary volume.
   b. If the secondary volume's vdisk contains other secondary volumes, detach those volumes.
   c. Stop the secondary volume's vdisk.
   d. If the secondary volumes' snap pools are in other vdisks, stop those vdisks.
   e. Move the vdisks into the secondary system. This system must support the link type that the replication set is configured to use. For example, if the replication set's link type is configured to use FC links, the secondary system must have FC ports.
2. In the secondary system:
   a. Start the snap pools' vdisks.
   b. Start the secondary volumes' vdisks.
   c. Reattach the secondary volumes.

NOTE: If the replication set was deleted before the secondary volume was reattached, you can clean up this remnant by reattaching the secondary volume, setting it to be the primary volume (by using the set replication-external-view command), and then deleting the replication set again.

Syntax `start vdisk` *`vdisk`*

Parameters *`vdisk`*
Name or serial number of the vdisk to start. For vdisk syntax, see Command syntax on page 20.

Example Start vdisks `vd2` and `vd1`, which respectively contain a snap pool and the associated secondary volume:

```
# start vdisk vd2
Success: Command completed successfully. (2012-01-21 12:26:32)

# start vdisk vd1
Success: Command completed successfully. (2012-01-21 12:26:37)
```

See also
- detach replication-volume
- reattach replication-volume
- show vdisks
- stop vdisk

stop vdisk

Description Stops a vdisk to prepare its disks for removal.

Stopping a vdisk is part of the process for moving a secondary volume from a primary system into a secondary system. The process to move a secondary volume is:

1. In the system where the secondary volume resides:
   a. Detach the secondary volume.
   b. If the secondary volume's vdisk contains other secondary volumes, detach those volumes.
   c. Stop the secondary volume's vdisk.
   d. If the secondary volumes' snap pools are in other vdisks, stop those vdisks.
   e. Move the vdisks into the secondary system. This system must support the link type that the replication set is configured to use. For example, if the replication set's link type is configured to use FC links, the secondary system must have FC ports.
2. In the secondary system:
   a. Start the snap pools' vdisks.
   b. Start the secondary volumes' vdisks.
   c. Reattach the secondary volumes.

Before stopping a vdisk, ensure that all secondary volumes that it contains are detached. When a vdisk is stopped:

- The volumes in the vdisk become inaccessible to hosts.
- Its cached data is flushed to disk.
- Removing its disks will not cause the system to report errors or to attempt reconstruction.

NOTE: You cannot stop a vdisk that contains a primary volume.

NOTE: If a secondary volume and its snap pool are in different vdisks, you cannot stop the snap pool's vdisk until you stop the secondary volume's vdisk.

If the stop operation succeeds, the vdisk's health is shown as `Unknown` and its status is shown as `STOP`.

If the stop operation succeeded for the secondary volume's vdisk and for its snap pool's vdisk (if applicable), you can move the disks into the remote system.

Syntax `stop vdisk` *`vdisk`*

Parameters *`vdisk`*
Name or serial number of the vdisk to stop. For vdisk syntax, see Command syntax on page 20.

Example Stop vdisks `vd1` and `vd2`, which respectively contain a secondary volume and its snap pool:

```
# stop vdisk vd1
Success: Command completed successfully. (2012-01-21 12:26:07)

# stop vdisk vd2
Success: Command completed successfully. (2012-01-21 12:26:12)
```

See also
- detach replication-volume
- reattach replication-volume
- show vdisks
- start vdisk

suspend replication

Description Suspends the current replication operation on the specified secondary volume. This command must be issued on the system that owns the secondary volume. Once suspended, the replication must be resumed or aborted to allow the volume to resume normal operation.

Syntax

```
suspend replication
    [set replication-set]
    replication-volume
```

Parameters

`set` *`replication-set`*
Optional. Name or serial number of the replication set.

`replication-volume`
Name or serial number of the secondary volume. If the name is not unique across replication sets, specify the `set` parameter.

Example Suspend replication of primary volume `V1` to secondary volume `rV1`:

```
# suspend replication rV1
Success: Command completed successfully. (2012-01-20 14:47:35)
```

See also

- abort replication
- resume replication
- show replication-sets
- show replication-volumes

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.

Syntax

```
test
    email|managedlogs|managedlogswarn|managedlogswrap|notification|snmp
    [region crash1|crash2|crash3|crash4|ecdebug|mc|scdebug]
```

Parameters `email|managedlogs|managedlogswarn|managedlogswrap|notification|snmp`

- `email`: This option behaves the same as the notification option and remains for backward compatibility only.
- `managedlogs`: Specify this option to test receipt of the managed-logs notification that logs need to be transferred. (Event 400)
- `managedlogswarn`: Specify this option to test receipt of the managed-logs notification that logs are nearly full and must be transferred to avoid losing older entries. (Event 401)
- `managedlogswrap`: Specify this option to test receipt of the managed-logs notification that logs have wrapped and older entries may be lost. (Event 402)
- `notification`: Specify this option to test receipt of event-notification messages by every interface that is configured to receive them, such as email, SNMP, and SMI-S. (Event 312)
- `snmp`: This option behaves the same as the notification option and remains for backward compatibility only.

`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) to send a notification about.

- `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`.

Example Test receipt of event notifications by every interface that is configured to receive them:

```
# test notification
Success: Command completed successfully. - The test event was sent. (2012-01-20
08:01:43)
```

Test receipt of the managed-logs notification that the SC log needs to be transferred:

```
# test managedlogs region scdebug
Success: Command completed successfully. - The test event was sent. (2012-01-20
16:03:21)
```

See also

- set email-parameters
- set snmp-parameters

trust

Description Enables an offline vdisk to be brought online for emergency data recovery. 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 output is shown in console mode but not in XML API mode.

The `trust` command provides an opportunity to recover data from a vdisk that has gone offline due to disk failure. The command forces a resynchronization of the metadata (as well as time and date stamps) that unifies members of a vdisk, and essentially puts the vdisk 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 vdisk 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" vdisk is back online, back up its data and audit the data to make sure that it is intact. Then delete that vdisk, create a new vdisk, and restore data from the backup to the new vdisk. Using a trusted vdisk is only a disaster-recovery measure; the vdisk has no tolerance for any additional failures.

The following procedure outlines the general steps for performing a trust operation. Before starting this procedure, it is recommended that you contact technical support for assistance in determining if the trust operation is applicable to your situation, and for assistance in performing 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 cannot be run on a quarantined vdisk. In many cases the vdisk 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, dequarantine the vdisk, confirm it is in offline state by using the `show vdisks` command, and then proceed to trust.
3. Never update controller-module, expansion-module, or disk firmware when the vdisk is offline.
4. Never clear unwritten data cache when a vdisk is offline.
5. Do not use the `trust` command on a vdisk that went offline during vdisk expansion.
6. Do not use the `trust` command on a vdisk with status `CRIT`. Instead, add spares and let the system reconstruct the vdisk.

Steps for running the trust command

1. Disable background scrub of disks and vdisks to avoid running scrubs automatically.
2. Identify the cause for the vdisk going offline.
3. If an external issue (power, cabling, and so forth) caused the vdisk to go offline, fix the external issue before continuing to the next step.
4. Disable host access to the offline vdisk. In a single-controller configuration, disconnect the host-port cables. In a dual-controller configuration:
   a. Determine the owning controller of the offline vdisk.
   b. As a precautionary measure, remove the host-port cables of the owning controller of the offline vdisk.
5. Unseat the spare disks associated with the vdisk 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 vdisk.
8. If the `trust` command determines that it would be unsafe to proceed, it will fail. If this happens you can either:
   - Please 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 vdisk with data corruption.

After running the trust command

1. Reinsert the host-port cables.
2. Perform a complete backup of the vdisk.
3. Delete the vdisk.
4. Replace the failed disks with new disks.
5. Re-create the vdisk.
6. Restore the data from the backup performed in step 2.
7. Restore original vdisk ownership.
8. Re-enable background scrub operations.

Syntax

```
trust
  [enable|disable]
  [vdisk vdisk]
  [unsafe]
```

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.

`vdisk vdisk`
Optional. The name or serial number of the vdisk to trust. For vdisk syntax, see Command syntax on page 20.

`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, which in most cases will result in an unstable vdisk with data corruption.

Output

With the `unsafe` parameter

`Location`
The enclosure ID and slot number of the disk.

`Serial Number`
The serial number of the disk.

`Type`

- SAS: Dual-port SAS.
- SAS-S: Single-port SAS.
- SATA: Dual-port SATA.
- SATA-S: Single-port SATA.
- sSATA: Dual-port SATA SSD.
- sSAS: Dual-port SAS SSD.

`State`

- `AVAIL`: Available.
- `FAILED`: The disk is unusable. Reasons for this status include: excessive media errors; SMART error; disk hardware failure; unsupported disk.
- `GLOBAL SP`: Global spare.
- `LEFTOVR`: Leftover.
- `VDISK`: Used in a vdisk.
- `VDISK SP`: Spare assigned to a vdisk.

`Partially Reconstructed`

- `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 vdisk.
- `False`: The disk data is in sync with other disks in the vdisk.

`Age`
The age of the disk in the vdisk. The age value starts at 1 and is incremented for all good disks in the vdisk each time there is a change in the disk configuration of the vdisk, 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 vdisk, that disk is out-of-sync with the other vdisk 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 vdisk if you want to use the `unsafe` parameter.

Example Trust a vdisk which has enough good disks to complete the trust operation. The vdisk 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 vdisk VD1
Success: Command completed successfully. (VD1) - Trust operation completed
successfully for this vdisk. (2013-09-17  04:29:35)
```

Trust a vdisk 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 vdisk VD1
Error: The trust operation failed because the vdisk has an insufficient number
of in-sync disks. - Please contact Support for further assistance.
(2013-09-17 04:13:13)
```

Trust a vdisk 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 vdisk VD1
Error: Command failed. - The vdisk specified contains out-of-sync or partially
reconstructed disks that are necessary to restore the vdisk 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 vdisk VD1 unsafe
Location Serial Number  Type State   Partially Reconstructed  Out Of Sync Age
------------------------------------------------------------------------------
1.2      SN             SAS  LEFTOVR False                    True        6
1.4      SN             SAS  VDISK   False                    False       7
1.5      SN             SAS  LEFTOVR True                     False       4
------------------------------------------------------------------------------
WARNING: Found 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 vdisk offline.
> continue
If you continue with the trust operation, you risk corrupting data in this
vdisk. 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 vdisk offline.
> accept
Success: Command completed successfully. (VD1) - Trust operation completed
successfully for this vdisk. (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)

# trust vdisk vdr5
Location Serial Number  Type State   Partially Reconstructed  Out Of Sync Age
------------------------------------------------------------------------------
1.2      SN             SAS  LEFTOVR False                    True        6
1.4      SN             SAS  VDISK   False                    False       7
1.5      SN             SAS  LEFTOVR True                     False       4
------------------------------------------------------------------------------
WARNING: * Found 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 vdisk offline.
> continue
If you continue with the trust operation, you risk corrupting data in this
vdisk. 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 vdisk 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 vdisk`:

```
# trust disable
Success: Command completed successfully. - Trust is disabled. (2013-09-17
17:40:01)
```

Basetypes

- status

See also

- show vdisks
- verify vdisk

unmap volume

Description Deletes explicit mappings or the default mapping for specified volumes. When an explicit mapping is deleted, access by that host 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 hosts to the volume is controlled by any explicit mappings of those hosts to the volume.

If you want to mask access for a specific host to a specific volume, use the map volume command and set the access parameter to `no-access`.

Syntax

```
unmap volume
    [host hosts]
    volumes
```

Parameters

`host` *hosts*
Optional. For FC and SAS, the nickname or 16-hex-digit WWPN of each host to unmap the volumes from. For iSCSI, the iSCSI node name (typically the IQN) or nickname of each initiator to unmap the volumes from. If the `host` parameter is omitted, mapping changes apply to all hosts not explicitly mapped (that is, to the default mapping).

volumes
Names or serial numbers of the volumes to unmap. For volume syntax, see Command syntax on page 20.

Example Delete explicit mappings of `Host1` to volumes `V1` and `V3` (leaving the default mappings unchanged):

```
# unmap volume host Host1 V1,V3
Info: The volume was unmapped. (V1) (2012-01-20 14:34:24)

Info: The volume was unmapped. (V3) (2012-01-20 14:34:24)

Success: Command completed successfully. - The volume(s) were unmapped.
(2012-01-20 14:34:24)
```

Delete volume `V2`'s default mapping (leaving explicit mappings unchanged):

```
# unmap volume V2
Info: The volume was unmapped. (V2) (2012-01-20 14:34:34)

Success: Command completed successfully. - The volume(s) were unmapped.
(2012-01-20 14:34:24)
```

See also

- map volume
- show host-maps
- show hosts
- show volume-maps
- show volumes

verify links

Description Verifies host-port links. If a remote system is specified, all link paths between the local system and the remote system are tested; otherwise, link paths between controller A and controller B in the local system are tested. The remote system must already have been added by using the create remote-system command.

For replication purposes, this tests the links to be used for replication from one system to another system. To verify bidirectional communication, run this command from the primary system to the secondary system, and then from the secondary system to the primary system.

Syntax

```
verify link
    [remote-system system]
    [link-type FC|iSCSI|ALL]
```

Parameters

`remote-system` *system*
Optional. The remote system's name or the IP address of one of its controller network ports. If this parameter is omitted, links between the local controllers are verified.

`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`
Port ID in the local system.

`Type`

- `FC`: FC port.
- `iSCSI`: iSCSI port.

`Links`
IDs of linked ports in the target system.

Example Verify all links between controllers A and B in the local system:

```
# verify links
Port Type  Links
---------------------------------------
A0   FC    B0,B1
A1   FC    B0,B1
B0   FC    A0,A1
B1   FC    A0,A1
---------------------------------------
Success: Command completed successfully. (2013-01-16 15:36:30)
```

Verify all links between the local system and remote system `System2`:

```
# verify links remote-system System2
Port Type  Links
---------------------------------------
A0   FC    A0,A1,B0,B1
A1   FC    A0,A1,B0,B1
B0   FC    A0,A1,B0,B1
B1   FC    A0,A1,B0,B1
---------------------------------------
Success: Command completed successfully. (2013-01-16 15:36:36)
```

Basetypes
- remote-links

See also
- show remote-systems
- verify remote-link

verify remote-link

Description Verifies host-port links between the local system and a specified remote system. All link paths, or only paths having a specified link type, between the two systems are tested. The remote system must already have been added by using the create remote-system command.For replication purposes, this tests the links to be used for replication from one system to another system. To verify bidirectional communication, run this command from the primary system to the secondary system, and then from the secondary system to the primary system.

Syntax

```
verify remote-link
   remote-system system
   [link-type FC|iSCSI|ALL]
```

Parameters

`remote-system` *system*
The remote system's name or the IP address of one of its controller network ports.

`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. If this parameter is omitted, all links are verified.

Output `Port`
Port ID on the local system.

`Type`

- `FC`: FC port.
- `iSCSI`: iSCSI port.
- `Offline`: Port is disconnected.

`Links`
IDs of linked ports on the remote system.

Example Verify all links between two 2-port, FC systems:

```
# verify remote-link remote-system System2
Port Type  Links
---------------------------------------
A0   FC    A0,A1,B0,B1
A1   FC    A0,A1,B0,B1
B0   FC    A0,A1,B0,B1
B1   FC    A0,A1,B0,B1
---------------------------------------
Success: Command completed successfully. (2013-01-16 15:38:24)
```

Verify only iSCSI links between two 4-port, FC/iSCSI systems:

```
# verify remote-link remote-system System2 link-type iSCSI
Port Type  Links
---------------------------------------
A2   iSCSI A2,A3,B2,B3
A3   iSCSI A2,A3,B2,B3
B2   iSCSI A2,A3,B2,B3
B3   iSCSI A2,A3,B2,B3
---------------------------------------
Success: Command completed successfully. (2013-01-16 15:38:24)
```

Basetypes

- remote-links

See also

- show remote-systems
- verify links

verify vdisk

Description Analyzes redundant vdisks to find and fix inconsistencies between their redundancy data and their user data. This command acts on disks that are associated with a vdisk and are neither dedicated spares nor leftovers. This command will 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); it 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 vdisk 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 in the vdisk is going bad.

TIP: Unless you want to verify without fixing errors, it is better to use the `scrub vdisk` command, which operates similarly to `verify vdisk` but also can find and fix media errors for any RAID level, including NRAID and RAID 0.

Syntax

```
verify vdisk
   vdisks
   [fix yes|no]
```

Parameters

vdisks
Names or serial numbers of the vdisks to verify. For vdisk syntax, see Command syntax on page 20.

`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 `yes`. If you specify `no`, event 21 will report any errors found and they will not be fixed.

Example Start verifying vdisk `vd1`:

```
# verify vdisk vd1
Info: The verify was started on vdisk vd1. (vd1) (2012-01-20 17:08:33)

Success: Command completed successfully. (2012-01-20 17:08:33)
```

See also

- abort verify
- scrub vdisk
- show vdisks

versions

Description Shows firmware and hardware version information for each controller module. Alias: `show versions`.

Syntax `versions [detail]`

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.

Example Show firmware-bundle version information for a system in which controller B is not installed:

```
# versions
Controller A Versions
---------------------
Bundle Version: value
Build Date: value

Controller B Versions
---------------------
Bundle Version: Not Present
Build Date: Not Present
```

Show detailed version information for each controller:

```
# versions detail
Controller A Versions
---------------------
Storage Controller CPU Type: value
Bundle Version: value
Build Date: value
Storage Controller Code Version: value
Storage Controller Code Baselevel: value
Memory Controller FPGA Code Version: value
Storage Controller Loader Code Version: value
CAPI Version: value
Management Controller Code Version: value
Management Controller Loader Code Version: value
Expander Controller Code Version: ver
CPLD Code Version: value
Hardware Version: value
Host Interface Module Version: value
Host Interface Module Model: value
Backplane Type: value
Host Interface Hardware (Chip) Version: value
Disk Interface Hardware (Chip) Version: value

Controller B Versions
---------------------
...

Success: Command completed successfully. (2012-01-19 15:36:07)
```

Basetypes
- versions
- status

See also
- show inquiry

volumecopy

Description Copies a standard, master, or snapshot volume to a new standard volume. The destination volume you specify must be in a vdisk owned by the same controller as the source volume. If the source volume is a snapshot, you can choose whether to include its modified data (data written to the snapshot since it was created). The destination volume is completely independent of the source volume.

The first time a volume copy is created of a standard volume, the volume is converted to a master volume and a snap pool is created in the volume's vdisk. The snap pool's size is either 20% of the volume size or 5.37 GB, whichever is larger. Before creating or scheduling copies, verify that the vdisk has enough free space to contain the snap pool.

NOTE: In rare cases, a large amount of I/O can cause a snap pool that is too small to fill quickly. This can result in all snapshots being deleted due to the snap pool running out of space. If you expect the snap pool to have a high rate of data change, use the show snap-pools command to view the snap pool's size. If it is less than 50 GB, use the expand snap-pool command to expand its size to at least 50 GB.

Before copying a master volume, verify that the snap-pool has space for a transient snapshot, which is used to track changes to the master volume while the copy is in progress.

For a master volume, the volume copy creates a transient snapshot, copies the data from the snapshot, and deletes the snapshot when the copy is complete. For a snapshot, the volume copy is performed directly from the source; this source data may change if modified data is to be included in the copy and the snapshot is mounted/presented/mapped and I/O is occurring to it.

To ensure the integrity of a copy of a master volume, unmount/unpresent/unmap the volume or at minimum perform a system cache flush and refrain from writing to the volume. Since the system cache flush is not natively supported on all operating systems, it is recommended to unmount/unpresent/unmap temporarily. The volume copy is for all data on the disk at the time of the request, so if there is data in the operating-system cache, that will not be copied over. Unmounting/unpresenting/unmapping the volume forces the cache flush from the operating system. After the volume copy has started, it is safe to remount/re-present/remap the volume and/or resume I/O.

To ensure the integrity of a copy of a snapshot with modified data, unmount/unpresent/unmap the snapshot or perform a system cache flush. The snapshot will not be available for read or write access until the volume copy is complete, at which time you can remount/re-present/remap the snapshot. If modified write data is not to be included in the copy, then you may safely leave the snapshot mounted/presented/mapped. During a volume copy using snapshot modified data, the system takes the snapshot offline.

While the copy operation is in progress, the destination volume type is shown as `standard*`; when complete, it changes to `standard`. To see the volume copy's progress use the show volumecopy-status command.

Syntax

```
volumecopy
   source-volume source-volume
   dest-vdisk vdisk
   [modified-snapshot yes|no]
   [prompt yes|no|expert]
   destination-volume
```

Parameters `source-volume source-volume`
Name or serial number of the volume or snapshot to copy. For volume syntax, see Command syntax on page 20.

`dest-vdisk` *vdisk*
Name or serial number of the destination vdisk. For vdisk syntax, see Command syntax on page 20.

`modified-snapshot yes|no`
Optional. Specifies whether to include or exclude modified write data from the snapshot in the copy. This parameter applies only when the source volume is a snapshot.

- `yes`: Include modified snapshot data.
- `no`: Exclude modified snapshot data.

If this parameter is omitted for a snapshot, modified snapshot data is excluded.

`prompt yes|no|expert`
Optional. Specifies an automatic response to the prompt to unmount/unpresent/unmap the source volume before proceeding:

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

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

`destination-volume`
A name for the volume to create in the destination vdisk. For volume syntax, see Command syntax on page 20.

Example Copy master volume `MV1` to new volume `MV1copy` on vdisk `VD2`:

```
# volumecopy source-volume MV1 dest-vdisk VD2 MV1copy
The source volume MUST be unmounted from all hosts prior to starting a volume
copy.
Ready to continue? yes
Success: Command completed successfully. (MV1) - The volume copy started.
(2012-01-20 12:02:02)

# show volumes
Vdisk  Name      ...  Type           ...
---------------------------------------
VD2    MV1       ...  master volume ...
VD2    MV1copy   ...  standard*     ...
---------------------------------------
```

Copy standard volume `V1` on vdisk `vd01` to new volume `V1_copy` on the same vdisk:

```
# volumecopy source-volume V1 dest-vdisk vd01 V1_copy
Info: The volume was created. (spV1)
Info: Volume V1 was converted to a master volume. (V1)
The source volume MUST be unmounted from all hosts prior to starting a volume
copy.
Ready to continue? yes
Success: Command completed successfully. (V1) - The volume copy started.
(2012-01-20 12:02:12)
```

See also

- abort volumecopy
- create task
- show vdisks
- show volumecopy-status
- show volumes

4 XML API basetype properties

Chapter 3 describes command output that is shown in console format. This chapter describes the basetype properties that CLI commands display in XML 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:

- 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 Table 3 on page 17.
- Example output from a command that uses the basetype. Some basetypes are used by multiple commands. Examples in this chapter were generated using the CLI parameter settings `api-embed` and `brief on`.
- References to embedded or nested basetypes that the output may show.

advanced-settings-table

Properties

Table 9 advanced-settings-table properties

Name	Type	Description
background-scrub	string	Shows whether disks in vdisks are automatically checked for disk defects to ensure system health. The interval between background vdisk scrub finishing and starting again is specified by the background-scrub-interval parameter. • Disabled: Background vdisk scrub is disabled. This is the default. • Enabled: Background vdisk scrub is enabled.
background-scrub-numeric	string	Numeric equivalents for background-scrub values. • 0: Disabled • 1: Enabled
background-scrub-interval	uint16	Shows the interval in hours between background vdisk scrub finishing and starting again, from 1–360 hours. The default is 24 hours.
partner-firmware-upgrade	string	Shows whether component firmware versions are monitored and will be automatically updated on the partner controller. • Disabled: Partner firmware upgrade is disabled. • Enabled: Partner firmware upgrade is enabled. This is the default.
partner-firmware-upgrade-numeric	string	Numeric equivalents for partner-firmware-upgrade values. • 0: Disabled • 1: Enabled
utility-priority	string	Priority at which data-redundancy utilities, such as vdisk verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect vdisk 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.
utility-priority-numeric	string	Numeric equivalents for utility-priority values. • 0: High • 1: Medium • 2: Low
smart	string	Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks. • Detect-Only: Each disk in the system retains its individual SMART setting, as will new disks added to the system. • Enabled: SMART is enabled for all disks in the system and will be enabled for new disks added to the system. This is the default. • Disabled: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.
smart-numeric	string	Numeric equivalents for smart values. • 0: Detect-Only • 1: Enabled • 2: Disabled

Table 9 advanced-settings-table properties (continued)

Name	Type	Description
dynamic-spares	string	Shows whether the storage system will automatically use a compatible disk as a spare to replace a failed disk in a vdisk if no compatible spare is available. • Disabled: The dynamic spares feature is disabled. This is the default. • Enabled: The dynamic spares feature is enabled.
emp-poll-rate	uint32	Shows the interval in seconds at which the storage system will poll each enclosure's Enclosure Management Processor (EMP) for status changes, from 5–3600 seconds. The default is 5 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. This is the default. • Enabled: Host control of caching is enabled.
host-cache-control-numeric	string	Numeric equivalents for host-cache-control values. • 0: Disabled • 1: 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. This is the default. • Flush To Disk: Good status is returned only after all write-back data for the specified volume is flushed to disk.
sync-cache-mode-numeric	string	Numeric equivalents for sync-cache-mode values. • 0: Immediate • 1: Flush to Disk
independent-cache	string	Shows the cache redundancy mode for a dual-controller storage system. • Disabled: Controller failover is enabled and data in a controller's write-back cache is mirrored to the partner controller. This is the default. • Enabled: The controllers use Independent Cache Performance Mode, in which controller failover is disabled and data in a controller's write-back cache is not mirrored to the partner controller. This improves write performance at the risk of losing unwritten data if a controller failure occurs while there is data in controller cache.
independent-cache-numeric	string	Numeric equivalents for independent-cache values. • 0: Disabled • 1: Enabled
missing-lun-response	string	Shows whether host drivers may probe for LUNs until the host drivers reach the LUN to which they have access. • Not Ready: Sends a reply that there is a LUN where a gap has been created but that it's "not ready." Sense data returned is sensekey = 2, code = 4, qualifier = 3. This is the default. • Illegal Request: Sends a reply that there is a LUN but that the request is "illegal." Sense data returned is sensekey = 5, code = 25h, qualifier = 0.
missing-lun-response-numeric	string	Numeric equivalents for missing-lun-response values. • 0: Not Ready • 1: Illegal Request
controller-failure	string	Shows whether the cache policy will change from write-back to write-through when a controller fails. • Disabled: The controller failure trigger is disabled. This is the default. • Enabled: The controller failure trigger is enabled.

Table 9 advanced-settings-table properties (continued)

Name	Type	Description
controller-failure-numeric	string	Numeric equivalents for controller-failure values. • 0: Disabled • 16: Enabled
super-cap-failure	string	Shows whether the cache policy will change from write-back to write-through when the super-capacitor that provides backup power for cache is not fully charged or fails. • Disabled: The super-capacitor failure trigger is disabled. • Enabled: The super-capacitor failure trigger is enabled. This is the default.
super-cap-failure-numeric	string	Numeric equivalents for super-cap-failure values. • 0: Disabled • 4: Enabled
compact-flash-failure	string	Shows whether the cache policy will change from write-back to write-through when CompactFlash memory is not detected during POST (Power-On Self-Test), fails during POST, or fails during controller operation. • Disabled: The CompactFlash failure trigger is disabled. • Enabled: The CompactFlash failure trigger is enabled. This is the default.
compact-flash-failure-numeric	string	Numeric equivalents for compact-flash-failure values. • 0: Disabled • 512: Enabled
power-supply-failure	string	Shows whether the cache policy will change from write-back to write-through when a power supply fails. • Disabled: The power-supply failure trigger is disabled. This is the default. • Enabled: The power-supply failure trigger is enabled.
power-supply-failure-numeric	string	Numeric equivalents for power-supply-failure values. • 0: Disabled • 64: Enabled
fan-failure	string	Shows whether the cache policy will change from write-back to write-through when a fan fails. • Disabled: The fan failure trigger is disabled. This is the default. • Enabled: The fan failure trigger is enabled.
fan-failure-numeric	string	Numeric equivalents for fan-failure values. • 0: Disabled • 128: Enabled
temperature-exceeded	string	Shows whether the system will shut down a controller when its temperature exceeds the critical operating range. • Disabled: The over-temperature trigger is disabled. This is the default. • Enabled: The over-temperature trigger is enabled.
temperature-exceeded-numeric	string	Numeric equivalents for temperature-exceeded values. • 0: Disabled • 8: Enabled
partner-notify	string	Shows whether the partner controller will be notified when a trigger condition occurs. • Disabled: Notification is disabled; the partner controller will continue using its current caching mode. This is the default. • Enabled: Notification is enabled; the partner controller will change to write-through mode for better data protection.

Table 9 advanced-settings-table properties (continued)

Name	Type	Description
partner-notify-numeric	string	Numeric equivalents for partner-notify values. • 0: Disabled • 2: Enabled
auto-write-back	string	Shows whether the cache policy will change from write-through to write-back when the trigger condition is cleared. • Disabled: Auto-write-back is disabled. • Enabled: Auto-write-back is enabled. This is the default.
auto-write-back-numeric	string	Numeric equivalents for auto-write-back values. • 0: Disabled • 1: Enabled
disk-dsd-enable	string	Shows whether available disks and global spares will spin down after a period of inactivity shown by the disk-dsd-delay property. • Disabled: Drive spin down for available disks and global spares is disabled. This is the default. • Enabled: Drive spin down for available disks and global spares is enabled.
disk-dsd-enable-numeric	string	Numeric equivalents for disk-dsd-enable values. • 0: Disabled • 1: Enabled
disk-dsd-delay	uint16	Specifies the period of inactivity in minutes after which available disks and global spares will spin down. The default is 15 minutes. The value 0 means spin down is disabled.
background-disk-scrub	string	Shows whether disks that are not in vdisks 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. This is the default. • Enabled: Background disk scrub is enabled.
background-disk-scrub-numeric	string	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. This is the default. • Enabled: The managed logs feature is enabled.
managed-logs-numeric	string	Numeric equivalents for managed-logs values. • 0: Disabled • 1: Enabled

Table 9 advanced-settings-table properties (continued)

Name	Type	Description
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

Example

```
# show advanced-settings
...
  <OBJECT basetype="advanced-settings-table" name="advanced-settings-table" oid="1">
    <PROPERTY name="background-scrub" type="string">Enabled</PROPERTY>
    <PROPERTY name="background-scrub-numeric" type="string">1</PROPERTY>
    <PROPERTY name="background-scrub-pool" type="string">Enabled</PROPERTY>
    <PROPERTY name="background-scrub-pool-numeric" type="string">1</PROPERTY>
    <PROPERTY name="background-scrub-interval" type="uint16">10</PROPERTY>
    <PROPERTY name="back-scrub-pool-interval" type="uint16">10</PROPERTY>
    <PROPERTY name="partner-firmware-upgrade" type="string">Disabled</PROPERTY>
    <PROPERTY name="partner-firmware-upgrade-numeric" type="string">0</PROPERTY>
    <PROPERTY name="utility-priority" type="string">High</PROPERTY>
    <PROPERTY name="utility-priority-numeric" type="string">0</PROPERTY>
    <PROPERTY name="smart" type="string">Detect-Only</PROPERTY>
    <PROPERTY name="smart-numeric" type="string">0</PROPERTY>
    <PROPERTY name="dynamic-spares" type="string">Disabled</PROPERTY>
    <PROPERTY name="emp-poll-rate" type="string">5</PROPERTY>
    <PROPERTY name="host-cache-control" type="string">Enabled</PROPERTY>
    <PROPERTY name="host-cache-control-numeric" type="string">1</PROPERTY>
    <PROPERTY name="sync-cache-mode" type="string">Immediate</PROPERTY>
    <PROPERTY name="sync-cache-mode-numeric" type="string">0</PROPERTY>
    <PROPERTY name="independent-cache" type="string">Disabled</PROPERTY>
    <PROPERTY name="independent-cache-numeric" type="string">0</PROPERTY>
    <PROPERTY name="missing-lun-response" type="string">Not Ready</PROPERTY>
    <PROPERTY name="missing-lun-response-numeric" type="string">0</PROPERTY>
    <PROPERTY name="controller-failure" type="string">Enabled</PROPERTY>
    <PROPERTY name="controller-failure-numeric" type="string">16</PROPERTY>
    <PROPERTY name="super-cap-failure" type="string">Enabled</PROPERTY>
    <PROPERTY name="super-cap-failure-numeric" type="string">4</PROPERTY>
    <PROPERTY name="compact-flash-failure" type="string">Enabled</PROPERTY>
    <PROPERTY name="compact-flash-failure-numeric" type="string">512</PROPERTY>
    <PROPERTY name="power-supply-failure" type="string">Enabled</PROPERTY>
    <PROPERTY name="power-supply-failure-numeric" type="string">64</PROPERTY>
    <PROPERTY name="fan-failure" type="string">Enabled</PROPERTY>
    <PROPERTY name="fan-failure-numeric" type="string">128</PROPERTY>
    <PROPERTY name="temperature-exceeded" type="string">Enabled</PROPERTY>
    <PROPERTY name="temperature-exceeded-numeric" type="string">8</PROPERTY>
    <PROPERTY name="partner-notify" type="string">Disabled</PROPERTY>
    <PROPERTY name="partner-notify-numeric" type="string">0</PROPERTY>
    <PROPERTY name="auto-write-back" type="string">Enabled</PROPERTY>
    <PROPERTY name="auto-write-back-numeric" type="string">1</PROPERTY>
    <PROPERTY name="disk-dsd-enable" type="string">Enabled</PROPERTY>
    <PROPERTY name="disk-dsd-enable-numeric" type="string">1</PROPERTY>
    <PROPERTY name="disk-dsd-enable-pool" type="string">Enabled</PROPERTY>
    <PROPERTY name="disk-dsd-enable-pool-numeric" type="string">1</PROPERTY>
    <PROPERTY name="disk-dsd-delay" type="uint16">15</PROPERTY>
    <PROPERTY name="disk-dsd-delay-pool" type="uint16">15</PROPERTY>
```

```
    <PROPERTY name="background-disk-scrub" type="string">Enabled</PROPERTY>
    <PROPERTY name="background-disk-scrub-numeric" type="string">1</PROPERTY>
    <PROPERTY name="managed-logs" type="string">Disabled</PROPERTY>
    <PROPERTY name="managed-logs-numeric" type="string">0</PROPERTY>
    <PROPERTY name="single-controller" type="string">Disabled</PROPERTY>
    <PROPERTY name="single-controller-numeric" type="string">0</PROPERTY>
  </OBJECT>
...
```

attribute-priorities

Properties

Table 10 attribute-priorities properties

Name	Type	Description
attribute-name	string	Snapshot retention attribute. • Standard Snapshot • Volume Copy Snapshot: A snapshot that is being used to copy data from a source volume to a destination volume. This attribute is temporary for the duration of the volume-copy process. • Replication Snapshot • Replicating Snapshot: A snapshot that is being replicated to a secondary volume. This snapshot is required in order to resume the replication. The attribute is temporary for the duration of the replication process. • Common Sync Point Snapshot: The latest snapshot that is copy-complete on all secondary volumes. It identifies a common point in time that is known by all destinations. • Only Sync Point Snapshot: The only sync point that is available on at least one secondary volume. If this snapshot is removed, then the next replication requires a full sync to be performed. • Queued Snapshot: A snapshot that was taken for remote replication but is queued waiting for the previous replications to complete. • DRM Snapshot: A temporary standard snapshot created from a replication snapshot for the purpose of doing a test failover for disaster recovery management (DRM).
priority-value	string	Retention priority for the corresponding attribute. Lower-priority snapshots will be deleted before higher-priority snapshots. Priority values are 1–65535.

Example

```
# show priorities spvd02_v001
...
  <OBJECT basetype="attribute-priorities" name="attribute-priorities" oid="1"
format="rows">
    <PROPERTY name="attribute-name" type="string">Standard Snapshot</PROPERTY>
    <PROPERTY name="priority-value" type="string">0x6000 (default)</PROPERTY>
  </OBJECT>
  <OBJECT basetype="attribute-priorities" name="attribute-priorities" oid="2"
format="rows">
    <PROPERTY name="attribute-name" type="string">Volume Copy Snapshot</PROPERTY>
    <PROPERTY name="priority-value" type="string">0xa000 (default)</PROPERTY>
  </OBJECT>
  <OBJECT basetype="attribute-priorities" name="attribute-priorities" oid="3"
format="rows">
    <PROPERTY name="attribute-name" type="string">Replication Snapshot</PROPERTY>
    <PROPERTY name="priority-value" type="string">0x4000 (default)</PROPERTY>
  </OBJECT>
  <OBJECT basetype="attribute-priorities" name="attribute-priorities" oid="4"
format="rows">
    <PROPERTY name="attribute-name" type="string">Replicating Snapshot</PROPERTY>
    <PROPERTY name="priority-value" type="string">0xc000 (default)</PROPERTY>
  </OBJECT>
  <OBJECT basetype="attribute-priorities" name="attribute-priorities" oid="5"
format="rows">
    <PROPERTY name="attribute-name" type="string">Common Sync Point Snapshot</PROPERTY>
    <PROPERTY name="priority-value" type="string">0x8000 (default)</PROPERTY>
  </OBJECT>
  <OBJECT basetype="attribute-priorities" name="attribute-priorities" oid="6"
format="rows">
    <PROPERTY name="attribute-name" type="string">Only Sync Point Snapshot</PROPERTY>
    <PROPERTY name="priority-value" type="string">0xe000 (default)</PROPERTY>
```

```
  </OBJECT>
  <OBJECT basetype="attribute-priorities" name="attribute-priorities" oid="7"
format="rows">
    <PROPERTY name="attribute-name" type="string">Queued Snapshot</PROPERTY>
    <PROPERTY name="priority-value" type="string">0x2000 (default)</PROPERTY>
  </OBJECT>
  <OBJECT basetype="attribute-priorities" name="attribute-priorities" oid="8"
format="rows">
    <PROPERTY name="attribute-name" type="string">DRM Snapshot</PROPERTY>
    <PROPERTY name="priority-value" type="string">0xb000 (default)</PROPERTY>
  </OBJECT>
...
```

auto-write-through-trigger

Properties

Table 11 auto-write-through-trigger properties

Name	Type	Description
controller-failure	string	Shows whether the cache policy will change from write-back to write-through when a controller fails. • Disabled: The controller failure trigger is disabled. This is the default. • Enabled: The controller failure trigger is enabled.
super-cap-failure	string	Shows whether the cache policy will change from write-back to write-through when the super-capacitor that provides backup power for cache is not fully charged or fails. • Disabled: The super-capacitor failure trigger is disabled. • Enabled: The super-capacitor failure trigger is enabled. This is the default.
compact-flash-failure	string	Shows whether the cache policy will change from write-back to write-through when CompactFlash memory is not detected during POST (Power-On Self-Test), fails during POST, or fails during controller operation. • Disabled: The CompactFlash failure trigger is disabled. • Enabled: The CompactFlash failure trigger is enabled. This is the default.
power-supply-failure	string	Shows whether the cache policy will change from write-back to write-through when a power supply fails. • Disabled: The power-supply failure trigger is disabled. This is the default. • Enabled: The power-supply failure trigger is enabled.
fan-failure	string	Shows whether the cache policy will change from write-back to write-through when a fan fails. • Disabled: The fan failure trigger is disabled. This is the default. • Enabled: The fan failure trigger is enabled.
temperature-exceeded	string	Shows whether the system will shut down a controller when its temperature exceeds the critical operating range. • Disabled: The over-temperature trigger is disabled. This is the default. • Enabled: The over-temperature trigger is enabled.
partner-notify	string	Shows whether the partner controller will be notified when a trigger condition occurs. • Disabled: Notification is disabled; the partner controller will continue using its current caching mode. This is the default. • Enabled: Notification is enabled; the partner controller will change to write-through mode for better data protection.
auto-write-back	string	Shows whether the cache policy will change from write-through to write-back when the trigger condition is cleared. • Disabled: Auto-write-back is disabled. • Enabled: Auto-write-back is enabled. This is the default.

Example

```
# show auto-write-through-trigger
...
  <OBJECT basetype="auto-write-through-trigger" name="awt-triggers" oid="1"
format="pairs">
    <PROPERTY name="controller-failure" type="string">Enabled</PROPERTY>
    <PROPERTY name="super-cap-failure" type="string">Enabled</PROPERTY>
    <PROPERTY name="compact-flash-failure" type="string">Enabled</PROPERTY>
    <PROPERTY name="power-supply-failure" type="string">Enabled</PROPERTY>
    <PROPERTY name="fan-failure" type="string">Enabled</PROPERTY>
```

```
    <PROPERTY name="temperature-exceeded" type="string">Enabled</PROPERTY>
    <PROPERTY name="partner-notify" type="string">Disabled</PROPERTY>
    <PROPERTY name="auto-write-back" type="string">Enabled</PROPERTY>
  </OBJECT>
...
```

cache-parameter

Properties

Table 12 cache-parameter properties

Name	Type	Description
`serial-number`	`string`	If a volume is specified, its serial number.
`volume-name`	`string`	If a volume is specified, its name.
`write-policy`	`string`	If a volume is specified, its cache write policy. • `write-back`: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the default and preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput. • `write-through`: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance.
`write-policy-numeric`	`string`	Numeric equivalents for `write-policy` values. • `0: write-through` • `1: write-back`
`cache-optimization`	`string`	If a volume is specified, its cache optimization mode. • `standard`: Optimizes cache for both sequential and random reads. Appropriate for applications that read and write small files in random order, such as transaction-based and database update applications. This is the default. • `no-mirror`: When this mode is enabled, each controller stops mirroring its cache metadata to the partner controller. This improves write I/O response time but at the risk of losing data during a failover. ULP behavior is not affected, with the exception that during failover any write data in cache will be lost.
`cache-optimization-numeric`	`string`	Numeric equivalents for `cache-optimization` values. • `0: standard` • `2: no-mirror`
`read-ahead-size`	`string`	If a volume is specified, its read-ahead cache setting. • `Disabled`: Read-ahead caching is disabled. • `Default`: One chunk for the first access in a sequential read and one stripe for all subsequent accesses. • `Maximum`: Maximum read-ahead size calculated by the controller. • `64 KB`, `128 KB`, `256 KB`, `512 KB`, `1 MB`, `2 MB`, `4 MB`, `8 MB`, `16 MB`, or `32 MB`: Size selected by a user.

Table 12 cache-parameter properties (continued)

Name	Type	Description
read-ahead-size-numeric	string	Numeric equivalents for read-ahead-size values. • -1: Default • 0: Disabled • 65536: 64 KB • 131072: 128 KB • 262144: 256 KB • 524288: 512 KB • 1048576: 1 MB • 2097152: 2 MB • 4194304: 4 MB • 8388608: 8 MB • 16777216: 16 MB • 33554432: 32 MB • -2147483648: Maximum

Example

```
# show cache-parameters vd02_v001
...
  <OBJECT basetype="cache-parameter" name="volume-cache-parameters" oid="4"
format="pairs">
    <PROPERTY name="serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="volume-name" type="string">vd02_v001</PROPERTY>
    <PROPERTY name="write-policy" type="string">write-back</PROPERTY>
    <PROPERTY name="write-policy-numeric" type="string">1</PROPERTY>
    <PROPERTY name="cache-optimization" type="string">standard</PROPERTY>
    <PROPERTY name="cache-optimization-numeric" type="string">0</PROPERTY>
    <PROPERTY name="read-ahead-size" type="string">Default</PROPERTY>
    <PROPERTY name="read-ahead-size-numeric" type="string">-1</PROPERTY>
  </OBJECT>
...
```

cache-settings

Properties

Table 13 cache-settings properties

Name	Type	Description
operation-mode	string	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: There is only a single controller in the enclosure. • Fail Over: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy. • Down: Both controllers are not operational.
operation-mode-numeric	string	Numeric equivalents for operation-mode values. • 1: Independent Cache Performance Mode • 2: Active-Active ULP • 3: Single Controller • 4: Fail Over • 5: Down

Example

```
# show cache-parameters vd02_v001
...
  <OBJECT basetype="cache-settings" name="system-cache-parameters" oid="1"
format="pairs">
    <PROPERTY name="operation-mode" type="string">Active-Active ULP</PROPERTY>
    <PROPERTY name="operation-mode-numeric" type="string">2</PROPERTY>
  </OBJECT>
...
```

Embedded basetypes

- controller-cache-parameters

certificate-status

Properties

Table 14 certificate-status properties

Name	Type	Description
`certificate-status`	`string`	• `Default`: No customer-supplied or alternate certificate has been installed. • `Customer-supplied`: A custom or alternate certificate has been installed.
`certificate-status-numeric`	`string`	Numeric equivalents for `certificate-status` values. • `0: Default` • `1: Customer-supplied`
`certificate-time`	`string`	Date and time, in the format *`year-month-day hour:minutes:seconds`*, when the custom certificate was created.
`certificate-signature`	`string`	The first few characters of the certificate file. This property is for diagnostic purposes, and can be used to verify that the proper certificate is in use.

Example

```
# show certificate
...
  <OBJECT basetype="certificate-status" name="certificate-status" oid="1" format="pairs">
    <PROPERTY name="certificate-status" type="string">Customer-supplied</PROPERTY>
    <PROPERTY name="certificate-status-numeric" type="string">1</PROPERTY>
    <PROPERTY name="certificate-time" type="string">2012-10-12 13:52:40</PROPERTY>
    <PROPERTY name="certificate-signature" type="string">-----BEGIN CERTIFICATE-----
MIIC2</PROPERTY>
  </OBJECT>
...
```

chap-records

Properties

Table 15 chap-records properties

Name	Type	Description
initiator-name	string	Originator name; typically the originator's IQN.
initiator-secret	string	Secret that the recipient uses to authenticate the originator.
oname	string	For mutual CHAP, the recipient name.
osecret	string	For mutual CHAP, the secret that the originator uses to authenticate the recipient.

Example

```
# show chap-records
...
  <OBJECT basetype="chap-records" name="chap-records" oid="1" format="pairs">
    <PROPERTY name="initiator-name" type="string">test1</PROPERTY>
    <PROPERTY name="initiator-secret" type="string">test1secret!</PROPERTY>
    <PROPERTY name="oname" type="string"></PROPERTY>
    <PROPERTY name="osecret" type="string"></PROPERTY>
  </OBJECT>
...
```

cli-parameters

Properties

Table 16 cli-parameters properties

Name	Type	Description
timeout	uint32	Time in seconds that the session can be idle before it automatically ends. Valid values are 120–43200 seconds (2–720 minutes). The default is 1800 seconds (30 minutes).
output-format	string	• console: Supports interactive use of the CLI by displaying command output in easily readable format. This format automatically sizes fields according to content and adjusts content to window resizes. 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. • ipa: Alternate form of XML output for internal use only. • json: Alternate data-interchange format for internal use only.
output-format-api	string	• console • api • api-brief • api-embed • api-embed-brief • json • json-full
output-format-api-numeric	string	Numeric equivalents for output-format-api values. • 1: console • 2: api • 3: api-brief • 4: api-embed • 5: api-embed-brief • 6: json • 7: json-full
brief-mode	string	• Enabled: In XML output, shows a subset of attributes of object properties. The name and type attributes are always shown. • Disabled: In XML output, shows all attributes of object properties. This is the default.
brief-mode-numeric	string	Numeric equivalents for brief-mode values. • 0: Disabled • 1: Enabled
base	uint8	Alias for storage-size-base.
pager	string	• Enabled: Halts output after each full screen to wait for keyboard input. This is the default. • Disabled: Output is not halted. When displaying output in XML API format, which is intended for scripting, disable paging.
pager-numeric	string	Numeric equivalents for pager values. • 0: Disabled • 1: Enabled

Table 16 cli-parameters properties (continued)

Name	Type	Description
`locale`	`string`	Display language. • `English` (the default) • `Spanish` • `French` • `German` • `Italian` • `Japanese` • `Korean` • `Dutch` • `Chinese-simplified` • `Chinese-traditional`
`locale-numeric`	`string`	Numeric equivalents for `locale` values. • `0: English` • `1: Spanish` • `2: French` • `3: German` • `4: Italian` • `5: Japanese` • `9: Korean` • `6: Dutch` • `7: Chinese-simplified` • `8: Chinese-traditional`
`storage-size-base`	`uint8`	Base for entry and display of storage-space sizes. • `2`: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude. • `10`: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. This 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.
`storage-size-precision`	`uint8`	Number of decimal places (1–10) for display of storage-space sizes. The default is 1.
`storage-size-units`	`string`	Unit for display of storage-space sizes. • `Auto`: Lets the system determine the proper unit for a size. 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 `storage-size-units` is set to TB, `storage-size-precision` is set to 1, and `storage-size-base` is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.
`storage-size-units-numeric`	`string`	Numeric equivalents for `storage-size-units` values. • `0: Auto` • `1: MB` • `2: GB` • `3: TB`
`temperature-scale`	`string`	• `Fahrenheit`: Temperatures are shown in degrees Fahrenheit. • `Celsius`: Temperatures are shown in degrees Celsius. This is the default.

Table 16 cli-parameters properties (continued)

Name	Type	Description
temperature-scale-numeric	string	Numeric equivalents for temperature-scale values. • 0: Fahrenheit • 1: Celsius
ui-refresh	uint16	User interface refresh rate. The default is 30 seconds.
user-type	string	The logged-in user's experience level. • Novice • Standard (the default) • Advanced • Diagnostic
user-type-numeric	string	Numeric equivalents for user-type values. • 1: Novice • 2: Standard • 3: Advanced • 4: Diagnostic
username	string	The logged-in user name.

Example

```
# show cli-parameters
...
  <OBJECT basetype="cli-parameters" name="cli-parameters" oid="1" format="pairs">
    <PROPERTY name="timeout" type="uint32">1800</PROPERTY>
    <PROPERTY name="output-format" type="string">api-embed</PROPERTY>
    <PROPERTY name="output-format-api" type="string">api-embed-brief</PROPERTY>
    <PROPERTY name="output-format-api-numeric" type="string">5</PROPERTY>
    <PROPERTY name="brief-mode" type="string">Enabled</PROPERTY>
    <PROPERTY name="brief-mode-numeric" type="string">1</PROPERTY>
    <PROPERTY name="base" type="uint8">10</PROPERTY>
    <PROPERTY name="pager" type="string">Enabled</PROPERTY>
    <PROPERTY name="pager-numeric" type="string">1</PROPERTY>
    <PROPERTY name="locale" type="string">English</PROPERTY>
    <PROPERTY name="locale-numeric" type="string">0</PROPERTY>
    <PROPERTY name="storage-size-base" type="uint8">10</PROPERTY>
    <PROPERTY name="storage-size-precision" type="uint8">2</PROPERTY>
    <PROPERTY name="storage-size-units" type="string">Auto</PROPERTY>
    <PROPERTY name="storage-size-units-numeric" type="string">0</PROPERTY>
    <PROPERTY name="temperature-scale" type="string">Celsius</PROPERTY>
    <PROPERTY name="temperature-scale-numeric" type="string">1</PROPERTY>
    <PROPERTY name="ui-refresh" type="uint16">30</PROPERTY>
    <PROPERTY name="user-type" type="string">Standard</PROPERTY>
    <PROPERTY name="user-type-numeric" type="string">2</PROPERTY>
    <PROPERTY name="username" type="string">manage</PROPERTY>
  </OBJECT>
...
```

compact-flash

Properties

Table 17 compact-flash properties

Name	Type	Description
durable-id	string	• Ctlr A CF: CompactFlash card in controller A. • Ctlr B CF: CompactFlash card in controller B.
controller-id	string	• A: Controller A. • B: Controller B.
controller-id-numeric	string	Numeric equivalents for controller-id values. • 0: B • 1: A
name	string	• Controller A CompactFlash • Controller B CompactFlash
status	string	• Not Installed • Installed
status-numeric	string	Numeric equivalents for status values. • 0: Not Installed • 1: Installed
cache-flush	string	• Enabled: If the controller loses power, it will automatically write cache data to the CompactFlash card. Cache flush is normally enabled, but is temporarily disabled during controller shut down. • Disabled: Cache flush is disabled.
cache-flush-numeric	string	Numeric equivalents for cache-flush values. • 0: Disabled • 1: Enabled
health	string	• OK • Fault • N/A
health-numeric	string	Numeric equivalents for health values. • 0: OK • 2: Fault • 4: N/A
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended action to take to resolve the health issue.

Example

```
# show controllers
...
    <OBJECT basetype="compact-flash" name="controller-a-compact-flash" oid="8"
format="pairs">
      <PROPERTY name="durable-id" type="string">Ctlr A CF</PROPERTY>
      <PROPERTY name="controller-id" type="string">A</PROPERTY>
      <PROPERTY name="controller-id-numeric" type="string">1</PROPERTY>
      <PROPERTY name="name" type="string">Controller A CompactFlash</PROPERTY>
      <PROPERTY name="status" type="string">Installed</PROPERTY>
      <PROPERTY name="status-numeric" type="string">1</PROPERTY>
      <PROPERTY name="cache-flush" type="string">Disabled</PROPERTY>
      <PROPERTY name="cache-flush-numeric" type="string">0</PROPERTY>
      <PROPERTY name="health" type="string">OK</PROPERTY>
```

```
      <PROPERTY name="health-numeric" type="string">0</PROPERTY>
      <PROPERTY name="health-reason" type="string"></PROPERTY>
      <PROPERTY name="health-recommendation" type="string"></PROPERTY>
    </OBJECT>
...
```

controller-cache-parameters

Properties

Table 18 controller-cache-parameters properties

Name	Type	Description
durable-id	string	• cache-params-a: Cache parameters for controller A. • cache-params-b: Cache parameters for controller B.
controller-id	string	• A: Controller A. • B: Controller B.
controller-id-numeric	string	Numeric equivalents for controller-id values. • 0: B • 1: A
name	string	• Controller A Cache Parameters • Controller B Cache Parameters
write-back-status	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. • Enabled: Write-back. This is the normal state. • Disabled: Write-through. • Not up: The controller is not up.
write-back-status-numeric	string	Numeric equivalents for write-back-status values. • 0: Enabled (write-back) • 1: Disabled (write-through) • 2: Not up
compact-flash-status	string	• Not Installed • Installed • Unknown
compact-flash-status-numeric	string	Numeric equivalents for compact-flash-status values. • 0: Not Installed • 1: Installed
cache-flush	string	• Enabled: If the controller loses power, it will automatically write cache data to the CompactFlash card. Cache flush is normally enabled, but is temporarily disabled during controller shut down. • Disabled: Cache flush is disabled.
cache-flush-numeric	string	Numeric equivalents for cache-flush values. • 0: Disabled • 1: Enabled

Example

```
# show cache-parameters
...
    <OBJECT basetype="controller-cache-parameters" name="controller-a-cache-parameters"
oid="2" format="pairs">
      <PROPERTY name="durable-id" type="string">cache-params-a</PROPERTY>
      <PROPERTY name="controller-id" type="string">A</PROPERTY>
      <PROPERTY name="controller-id-numeric" type="string">1</PROPERTY>
      <PROPERTY name="name" type="string">Controller A Cache Parameters</PROPERTY>
      <PROPERTY name="write-back-status" type="string">Enabled</PROPERTY>
```

```
      <PROPERTY name="write-back-status-numeric" type="string">0</PROPERTY>
      <PROPERTY name="compact-flash-status" type="string">Installed</PROPERTY>
      <PROPERTY name="compact-flash-status-numeric" type="string">1</PROPERTY>
      <PROPERTY name="cache-flush" type="string">Enabled</PROPERTY>
      <PROPERTY name="cache-flush-numeric" type="string">1</PROPERTY>
    </OBJECT>
...
```

controllers

Properties

Table 19 controllers properties

Name	Type	Description
durable-id	string	• controller a • controller b
controller-id	string	• A: Controller A. • B: Controller B.
controller-id-numeric	string	• 0: B • 1: A
serial-number	string	• Serial number of the controller module. • Not Available: The controller module is down or not installed.
hardware-version	string	Controller module hardware version.
cpld-version	string	Complex Programmable Logic Device (CPLD) firmware version.
mac-address	string	Controller network port MAC address.
node-wwn	string	Storage system World Wide Node Name (WWNN).
ip-address	string	Controller network port IP address.
ip-subnet-mask	string	Controller network port IP subnet mask.
ip-gateway	string	Controller network port gateway IP address.
disks	uint32	Number of disks in the storage system.
virtual-disks	uint32	Number of vdisks in the storage system.
cache-memory-size	uint32	Controller cache memory size (MB).
host-ports	uint32	Number of host ports in the controller module.
drive-channels	uint32	Number of expansion ports in the controller enclosure.
drive-bus-type	string	Controller interface to disks. • SAS
drive-bus-type-numeric	string	Numeric equivalent for drive-bus-type value. • 8: SAS
status	string	• Operational • Down • Not installed • Unknown
status-numeric	string	Numeric equivalents for status values. • 0: Operational • 1: Down • 2: Not installed • 3: Unknown

Table 19 controllers properties (continued)

Name	Type	Description
failed-over	string	Indicates whether the partner controller has failed over to this controller. • No: The partner controller has not failed over to this controller. • Yes: The partner controller has either failed or been shut down, and its responsibilities have been taken over by this controller. There will be a delay between the time that the value of 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.
failed-over-numeric	string	Numeric equivalents for failed-over values. • 0: No • 1: Yes
fail-over-reason	string	If failed-over is Yes, a reason for the failover appears; otherwise, Not applicable appears.
fail-over-reason-numeric	string	Numeric equivalents for fail-over-reason values.
sc-fw	string	Storage Controller firmware version.
vendor	string	Controller manufacturer.
model	string	Controller model.
sc-cpu-type	string	Storage Controller processor type.
sc-cpu-speed	sint32	Storage Controller processor speed.
internal-serial-number	string	Internal serial number of the controller.
cache-lock	string	Shows whether hosts are prevented from using the SCSI MODE SELECT command to change the storage system's write-back cache setting. • No: Hosts are permitted to disable write-back cache. • Yes: Hosts are prevented from disabling write-back cache. This is the default.
cache-lock-numeric	string	Numeric equivalents for cache-lock values. • 0: No • 1: Yes
write-policy	string	The current, system-wide cache policy as determined by auto-write-through (AWT) logic. This value is not settable by users. If an AWT trigger condition (such as a CompactFlash failure) is met, the cache policy for all volumes changes to write-through, overriding the volume-specific settings. When the problem is corrected, the cache policy reverts to the value configured for each individual volume. • write-back: This is the normal state. • write-through • Not up: The controller is not up.
write-policy-numeric	string	Numeric equivalents for write-policy values. • 0: write-back • 1: write-through • 2: Not up.
description	string	FRU long description.
part-number	string	Part number for the FRU.
revision	string	Hardware revision level for the FRU.

Table 19 controllers properties (continued)

Name	Type	Description
dash-level	string	FRU template revision number.
fru-shortname	string	FRU short description.
mfg-date	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the controller's PCBA was programmed.
mfg-date-numeric	string	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.
health	string	• OK • Fault • Unknown
health-numeric	string	Numeric equivalents for health values. • 0: OK • 2: Fault • 3: Unknown
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.
position	string	Position of the controller in the enclosure. • Top: The controller is in the top slot. • Bottom: The controller is in the bottom slot.
position-numeric	string	Numeric equivalents for position values. • 0: Top • 1: Bottom
phy-isolation	string	Shows whether the automatic disabling of SAS expander PHYs having high error counts is enabled or disabled for this controller. • Enabled: PHY fault isolation is enabled. This is the default. • Disabled: PHY fault isolation is disabled.
phy-isolation-numeric	string	Numeric equivalents for phy-isolation values. • 0: Enabled • 1: Disabled
redundancy-mode	string	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. • Single Controller: The enclosure contains a single controller. • Fail 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 19 controllers properties (continued)

Name	Type	Description
redundancy-mode-numeric	string	Numeric equivalents for redundancy-mode values. • 1: Independent Cache Performance Mode • 2: Active-Active ULP • 3: Single Controller • 4: Fail 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	string	Numeric equivalents for redundancy-status values. • 0: Operational but not redundant • 1: Redundant with independent cache • 3: Redundant • 4: Down • 5: Unknown

Example

```
# show controllers
...
  <OBJECT basetype="controllers" name="controllers" oid="1" format="pairs">
    <PROPERTY name="durable-id" type="string">controller_a</PROPERTY>
    <PROPERTY name="controller-id" type="string">A</PROPERTY>
    <PROPERTY name="controller-id-numeric" type="string">1</PROPERTY>
    <PROPERTY name="serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="hardware-version" type="string">52</PROPERTY>
    <PROPERTY name="cpld-version" type="string">23</PROPERTY>
    <PROPERTY name="mac-address" type="string">00:C0:FF:29:41:61</PROPERTY>
    <PROPERTY name="node-wwn" type="string">208000c0ff243014</PROPERTY>
    <PROPERTY name="ip-address" type="string">10.134.10.133</PROPERTY>
    <PROPERTY name="ip-subnet-mask" type="string">255.255.0.0</PROPERTY>
    <PROPERTY name="ip-gateway" type="string">10.134.0.1</PROPERTY>
    <PROPERTY name="disks" type="uint32">45</PROPERTY>
    <PROPERTY name="virtual-disks" type="uint32">5</PROPERTY>
    <PROPERTY name="cache-memory-size" type="uint32">2048</PROPERTY>
    <PROPERTY name="host-ports" type="uint32">2</PROPERTY>
    <PROPERTY name="drive-channels" type="uint32">2</PROPERTY>
    <PROPERTY name="drive-bus-type" type="string">SAS</PROPERTY>
    <PROPERTY name="drive-bus-type-numeric" type="string">8</PROPERTY>
    <PROPERTY name="status" type="string">Operational</PROPERTY>
    <PROPERTY name="status-numeric" type="string">0</PROPERTY>
    <PROPERTY name="failed-over" type="string">No</PROPERTY>
    <PROPERTY name="failed-over-numeric" type="string">0</PROPERTY>
    <PROPERTY name="fail-over-reason" type="string">Not applicable</PROPERTY>
    <PROPERTY name="fail-over-reason-numeric" type="string">0</PROPERTY>
    <PROPERTY name="sc-fw" type="string">T240R14-01</PROPERTY>
    <PROPERTY name="vendor" type="string">vendor</PROPERTY>
    <PROPERTY name="model" type="string">model</PROPERTY>
    <PROPERTY name="sc-cpu-type" type="string">Intel Tolapai</PROPERTY>
    <PROPERTY name="sc-cpu-speed" type="sint32">1200</PROPERTY>
    <PROPERTY name="internal-serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="cache-lock" type="string">No</PROPERTY>
    <PROPERTY name="cache-lock-numeric" type="string">0</PROPERTY>
```

```
    <PROPERTY name="write-policy" type="string">write-back</PROPERTY>
    <PROPERTY name="write-policy-numeric" type="string">0</PROPERTY>
    <PROPERTY name="description" type="string">description</PROPERTY>
    <PROPERTY name="part-number" type="string">PN</PROPERTY>
    <PROPERTY name="revision" type="string">50</PROPERTY>
    <PROPERTY name="dash-level" type="string"></PROPERTY>
    <PROPERTY name="fru-shortname" type="string">RAID IOM</PROPERTY>
    <PROPERTY name="mfg-date" type="string">2009-07-30 20:45:37</PROPERTY>
    <PROPERTY name="mfg-date-numeric" type="string">1248986737</PROPERTY>
    <PROPERTY name="mfg-location" type="string">Longmont, CO, USA</PROPERTY>
    <PROPERTY name="mfg-vendor-id" key="true" type="string">0x03FD</PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
    <PROPERTY name="position" type="string">Top</PROPERTY>
    <PROPERTY name="position-numeric" type="string">1</PROPERTY>
    <PROPERTY name="phy-isolation" type="string">Enabled</PROPERTY>
    <PROPERTY name="phy-isolation-numeric" type="string">0</PROPERTY>
    <PROPERTY name="redundancy-mode" type="string">Unknown</PROPERTY>
    <PROPERTY name="redundancy-mode-numeric" type="string">2</PROPERTY>
    <PROPERTY name="redundancy-status" type="string">Redundant</PROPERTY>
    <PROPERTY name="redundancy-status-numeric" type="string">5918</PROPERTY>
  </OBJECT>
...
```

Embedded basetypes

- unhealthy-component
- network-parameters
- port
- expander-ports
- compact-flash

controller-statistics

Properties

Table 20 controller-statistics properties

Name	Type	Description
durable-id	string	• controller a • controller b
cpu-load	uint32	Percentage of time the CPU is busy, from 0–100.
power-on-time	uint32	Number of seconds since the controller was restarted.
write-cache-used	uint32	Percentage of write cache in use, from 0–100.
bytes-per-second	string	Data transfer rate calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	string	Unformatted bytes-per-second value.
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
number-of-reads	uint64	For the controller whose host ports had I/O activity, the number of read operations since these statistics were last reset or since the controller was restarted.
read-cache-hits	uint64	For the controller that owns the volume, the number of times the block to be read is found in cache.
read-cache-misses	uint64	For the controller that owns the volume, the number of times the block to be read is not found in cache.
number-of-writes	uint64	For the controller whose host ports had I/O activity, the number of write operations since these statistics were last reset or since the controller was restarted.
write-cache-hits	uint64	For the controller that owns the volume, the number of times the block written to is found in cache.
write-cache-misses	uint64	For the controller that owns the volume, the number of times the block written to is not found in cache.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	string	Unformatted data-read value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	string	Unformatted data-written value.
reset-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	string	Unformatted reset-time value.
start-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling started for the iops and bytes-per-second values.

Table 20 controller-statistics properties (continued)

Name	Type	Description
start-sample-time-numeric	string	Unformatted start-sample-time value.
stop-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling stopped for the iops and bytes-per-second values.
stop-sample-time-numeric	string	Unformatted stop-sample-time value.
total-power-on-hours	string	The total amount of hours the controller has been powered on in its life time.

Example

```
# show controller-statistics
...
  <OBJECT basetype="controller-statistics" name="controller-statistics" oid="1"
format="rows">
    <PROPERTY name="durable-id" type="string">controller_A</PROPERTY>
    <PROPERTY name="cpu-load" type="uint32">6</PROPERTY>
    <PROPERTY name="power-on-time" type="uint32">171975</PROPERTY>
    <PROPERTY name="write-cache-used" type="uint32">0</PROPERTY>
    <PROPERTY name="bytes-per-second" units="KB" type="string">667.64KB</PROPERTY>
    <PROPERTY name="bytes-per-second-numeric" type="string">667648</PROPERTY>
    <PROPERTY name="iops" type="uint32">2</PROPERTY>
    <PROPERTY name="number-of-reads" type="uint64">386768</PROPERTY>
    <PROPERTY name="read-cache-hits" type="uint64">10192</PROPERTY>
    <PROPERTY name="read-cache-misses" type="uint64">6097968</PROPERTY>
    <PROPERTY name="number-of-writes" type="uint64">98020</PROPERTY>
    <PROPERTY name="write-cache-hits" type="uint64">83360</PROPERTY>
    <PROPERTY name="write-cache-misses" type="uint64">728185</PROPERTY>
    <PROPERTY name="data-read" units="GB" type="string">100.01GB</PROPERTY>
    <PROPERTY name="data-read-numeric" type="string">100017762304</PROPERTY>
    <PROPERTY name="data-written" units="GB" type="string">11.80GB</PROPERTY>
    <PROPERTY name="data-written-numeric" type="string">11807576064</PROPERTY>
    <PROPERTY name="reset-time" type="string">2012-02-13 12:45:35</PROPERTY>
    <PROPERTY name="reset-time-numeric" type="string">1329137135</PROPERTY>
    <PROPERTY name="start-sample-time" type="string">2012-02-24 12:47:34</PROPERTY>
    <PROPERTY name="start-sample-time-numeric" type="string">1330087654</PROPERTY>
    <PROPERTY name="stop-sample-time" type="string">2012-02-29 10:19:57</PROPERTY>
    <PROPERTY name="stop-sample-time-numeric" type="string">1330510797</PROPERTY>
    <PROPERTY name="total-power-on-hours" type="string">911.48</PROPERTY>
  </OBJECT>
...
```

debug-log-parameters

Properties

Table 21 debug-log-parameters properties

Name	Type	Description
host	string	Shows whether host interface debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
host-numeric	string	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. This is the default.
disk-numeric	string	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. This is the default. • On: Enabled.
mem-numeric	string	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. • Off: Disabled. • On: Enabled. This is the default.
fo-numeric	string	Numeric equivalents for fo values. • 0: Off • 1: On
msg	string	Shows whether inter-controller message debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
msg-numeric	string	Numeric equivalents for msg values. • 0: Off • 1: On
ioa	string	Shows whether standard debug messages for an I/O interface driver are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
ioa-numeric	string	Numeric equivalents for ioa values. • 0: Off • 1: On

Table 21 debug-log-parameters properties (continued)

Name	Type	Description
iob	string	Shows whether resource-count debug messages for an I/O interface driver are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. This is the default. • On: Enabled.
iob-numeric	string	Numeric equivalents for iob values. • 0: Off • 1: On
ioc	string	Shows whether upper-layer, verbose debug messages for an I/O interface driver are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. This is the default. • On: Enabled.
ioc-numeric	string	Numeric equivalents for ioc values. • 0: Off • 1: On
iod	string	Shows whether lower-layer, verbose debug messages for an I/O interface driver are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. This is the default. • On: Enabled.
iod-numeric	string	Numeric equivalents for iod values. • 0: Off • 1: On
misc	string	Shows whether internal debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
misc-numeric	string	Numeric equivalents for misc values. • 0: Off • 1: On
rcm	string	Shows whether removable-component manager debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. This is the default. • On: Enabled.
rcm-numeric	string	Numeric equivalents for rcm values. • 0: Off • 1: On
raid	string	Shows whether RAID debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
raid-numeric	string	Numeric equivalents for raid values. • 0: Off • 1: On

Table 21 debug-log-parameters properties (continued)

Name	Type	Description
cache	string	Shows whether cache debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
cache-numeric	string	Numeric equivalents for cache values. • 0: Off • 1: On
emp	string	Shows whether Enclosure Management Processor debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
emp-numeric	string	Numeric equivalents for emp values. • 0: Off • 1: On
capi	string	Shows whether Internal Configuration API debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
capi-numeric	string	Numeric equivalents for capi values. • 0: Off • 1: On
mui	string	Shows whether internal service interface debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
mui-numeric	string	Numeric equivalents for mui values. • 0: Off • 1: On
bkcfg	string	Shows whether internal configuration debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
bkcfg-numeric	string	Numeric equivalents for bkcfg values. • 0: Off • 1: On
awt	string	Shows whether debug messages for auto-write-through cache triggers are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. This is the default. • On: Enabled.
awt-numeric	string	Numeric equivalents for awt values. • 0: Off • 1: On

Table 21 debug-log-parameters properties (continued)

Name	Type	Description
res2	string	Shows whether internal debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. This is the default. • On: Enabled.
res2-numeric	string	Numeric equivalents for res2 values. • 0: Off • 1: On
capi2	string	Shows whether Internal Configuration API tracing messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. This is the default. • On: Enabled.
capi2-numeric	string	Numeric equivalents for capi2 values. • 0: Off • 1: On
dms	string	Shows whether Snapshot feature debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
dms-numeric	string	Numeric equivalents for dms values. • 0: Off • 1: On
fruid	string	Shows whether FRU ID debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. • On: Enabled. This is the default.
fruid-numeric	string	Numeric equivalents for fruid values. • 0: Off • 1: On
resmgr	string	Shows whether Reservation Manager debug messages are enabled for inclusion in the Storage Controller debug log. • Off: Disabled. This is the default. • On: Enabled.
resmgr-numeric	string	Numeric equivalents for resmgr values. • 0: Off • 1: On
init	string	Not used.
init-numeric	string	Not used.
ps	string	Not used.
ps-numeric	string	Not used.
hb	string	Not used.
hb-numeric	string	Not used.

Example

```
# show debug-log-parameters
...
  <OBJECT basetype="debug-log-parameters" name="debug-log-parameters" oid="1"
format="pairs">
    <PROPERTY name="host" type="string">On</PROPERTY>
    <PROPERTY name="host-numeric" type="string">1</PROPERTY>
    <PROPERTY name="disk" type="string">On</PROPERTY>
    <PROPERTY name="disk-numeric" type="string">1</PROPERTY>
    <PROPERTY name="mem" type="string">Off</PROPERTY>
    <PROPERTY name="mem-numeric" type="string">0</PROPERTY>
    <PROPERTY name="fo" type="string">On</PROPERTY>
    <PROPERTY name="fo-numeric" type="string">1</PROPERTY>
    <PROPERTY name="msg" type="string">On</PROPERTY>
    <PROPERTY name="msg-numeric" type="string">1</PROPERTY>
    <PROPERTY name="ioa" type="string">On</PROPERTY>
    <PROPERTY name="ioa-numeric" type="string">1</PROPERTY>
    <PROPERTY name="iob" type="string">Off</PROPERTY>
    <PROPERTY name="iob-numeric" type="string">0</PROPERTY>
    <PROPERTY name="ioc" type="string">Off</PROPERTY>
    <PROPERTY name="ioc-numeric" type="string">0</PROPERTY>
    <PROPERTY name="iod" type="string">Off</PROPERTY>
    <PROPERTY name="iod-numeric" type="string">0</PROPERTY>
    <PROPERTY name="misc" type="string">On</PROPERTY>
    <PROPERTY name="misc-numeric" type="string">1</PROPERTY>
    <PROPERTY name="rcm" type="string">Off</PROPERTY>
    <PROPERTY name="rcm-numeric" type="string">0</PROPERTY>
    <PROPERTY name="raid" type="string">On</PROPERTY>
    <PROPERTY name="raid-numeric" type="string">1</PROPERTY>
    <PROPERTY name="cache" type="string">On</PROPERTY>
    <PROPERTY name="cache-numeric" type="string">1</PROPERTY>
    <PROPERTY name="emp" type="string">On</PROPERTY>
    <PROPERTY name="emp-numeric" type="string">1</PROPERTY>
    <PROPERTY name="capi" type="string">On</PROPERTY>
    <PROPERTY name="capi-numeric" type="string">1</PROPERTY>
    <PROPERTY name="mui" type="string">On</PROPERTY>
    <PROPERTY name="mui-numeric" type="string">1</PROPERTY>
    <PROPERTY name="bkcfg" type="string">On</PROPERTY>
    <PROPERTY name="bkcfg-numeric" type="string">1</PROPERTY>
    <PROPERTY name="awt" type="string">Off</PROPERTY>
    <PROPERTY name="awt-numeric" type="string">0</PROPERTY>
    <PROPERTY name="res2" type="string">Off</PROPERTY>
    <PROPERTY name="res2-numeric" type="string">0</PROPERTY>
    <PROPERTY name="capi2" type="string">Off</PROPERTY>
    <PROPERTY name="capi2-numeric" type="string">0</PROPERTY>
    <PROPERTY name="dms" type="string">On</PROPERTY>
    <PROPERTY name="dms-numeric" type="string">1</PROPERTY>
    <PROPERTY name="fruid" type="string">On</PROPERTY>
    <PROPERTY name="fruid-numeric" type="string">1</PROPERTY>
    <PROPERTY name="resmgr" type="string">Off</PROPERTY>
    <PROPERTY name="resmgr-numeric" type="string">0</PROPERTY>
    <PROPERTY name="init" type="string">Off</PROPERTY>
    <PROPERTY name="init-numeric" type="string">0</PROPERTY>
    <PROPERTY name="ps" type="string">Off</PROPERTY>
    <PROPERTY name="ps-numeric" type="string">0</PROPERTY>
    <PROPERTY name="hb" type="string">Off</PROPERTY>
    <PROPERTY name="hb-numeric" type="string">0</PROPERTY>
  </OBJECT>
...
```

disk-hist-statistics

Properties

Table 22 disk-hist-statistics properties

Name	Type	Description
number-of-ios	uint64	Total number of read and write operations since the last sampling time.
number-of-reads	uint64	Number of read operations since the last sampling time.
number-of-writes	uint64	Number of write operations since the last sampling time.
total-data-transferred	string	Total amount of data read and written since the last sampling time.
total-data-transferred-numeric	uint64	Unformatted total-data-transferred value.
data-read	string	Amount of data read since the last sampling time.
data-read-numeric	uint64	Unformatted data-read value.
data-written	string	Amount of data written since the last sampling time.
data-written-numeric	uint64	Unformatted data-written value.
total-iops	uint64	Total number of read and write operations per second since the last sampling time.
read-iops	uint64	Number of read operations per second since the last sampling time.
write-iops	uint64	Number of write operations per second since the last sampling time.
total-bytes-per-second	string	Total data transfer rate, in bytes per second, since the last sampling time.
total-bytes-per-second-numeric	uint64	Unformatted total-bytes-per-second value.
read-bytes-per-second	string	Data transfer rate, in bytes per second, for read operations since the last sampling time.
read-bytes-per-second-numeric	uint64	Unformatted read-bytes-per-second value.
write-bytes-per-second	string	Data transfer rate, in bytes per second, for write operations last sampling time.
write-bytes-per-second-numeric	uint64	Unformatted write-bytes-per-second value.
queue-depth	uint64	Average number of pending read and write operations being serviced since the last sampling time. This value represents periods of activity only and excludes periods of inactivity.
avg-rsp-time	string	Average response time, in microseconds, for read and write operations since the last sampling time.
avg-read-rsp-time	string	Average response time, in microseconds, for read operations since the last sampling time.
avg-write-rsp-time	string	Average response time, in microseconds, for write operations since the last sampling time.

Table 22 disk-hist-statistics properties (continued)

Name	Type	Description
avg-io-size	string	Average data size of read and write operations since the last sampling time.
avg-io-size-numeric	uint64	Unformatted avg-io-size value.
avg-read-io-size	string	Average data size of read operations since the last sampling time.
avg-read-io-size-numeric	uint64	Unformatted avg-read-io-size value.
avg-write-io-size	string	Average data size of write operations since the last sampling time.
avg-write-io-size-numeric	uint64	Unformatted avg-write-io-size value.
number-of-disk-errors	uint64	Total number of disk errors detected since the last sampling time. Error types include: number of SMART events; number of timeouts accessing the disk; number of times the disk did not respond; number of attempts by the storage system to spin-up the disk; media errors generated by the disk as specified by its manufacturer; non-media errors (generated by the storage system, or by the disk and not categorized as media errors); number of bad-block reassignments.
sample-time	string	Date and time, in the format *year-month-day hour*:*minutes*:*seconds*, when the data sample was taken.
sample-time-numeric	uint32	Unformatted sample-time value.

Example

```
# show disk-statistics 1.1 historical
...
    <OBJECT basetype="disk-hist-statistics" name="disk-hist-statistics" oid="9"
format="rows">
      <PROPERTY name="number-of-ios" type="uint64">30</PROPERTY>
      <PROPERTY name="number-of-reads" type="uint64">6</PROPERTY>
      <PROPERTY name="number-of-writes" type="uint64">24</PROPERTY>
      <PROPERTY name="total-data-transferred" units="KB"
type="string">2490.36KB</PROPERTY>
      <PROPERTY name="total-data-transferred-numeric" type="string">2490368</PROPERTY>
      <PROPERTY name="data-read" units="KB" type="string">294.91KB</PROPERTY>
      <PROPERTY name="data-read-numeric" type="string">294912</PROPERTY>
      <PROPERTY name="data-written" units="KB" type="string">2195.45KB</PROPERTY>
      <PROPERTY name="data-written-numeric" type="string">2195456</PROPERTY>
      <PROPERTY name="total-iops" type="uint64">0</PROPERTY>
      <PROPERTY name="read-iops" type="uint64">0</PROPERTY>
      <PROPERTY name="write-iops" type="uint64">0</PROPERTY>
      <PROPERTY name="total-bytes-per-sec" units="B" type="string">2560B</PROPERTY>
      <PROPERTY name="total-bytes-per-sec-numeric" type="string">2560</PROPERTY>
      <PROPERTY name="read-bytes-per-sec" units="B" type="string">0B</PROPERTY>
      <PROPERTY name="read-bytes-per-sec-numeric" type="string">0</PROPERTY>
      <PROPERTY name="write-bytes-per-sec" units="B" type="string">2048B</PROPERTY>
      <PROPERTY name="write-bytes-per-sec-numeric" type="string">2048</PROPERTY>
      <PROPERTY name="queue-depth" type="uint64">2</PROPERTY>
      <PROPERTY name="avg-rsp-time" type="uint64">10295</PROPERTY>
      <PROPERTY name="avg-read-rsp-time" type="uint64">11916</PROPERTY>
      <PROPERTY name="avg-write-rsp-time" type="uint64">9890</PROPERTY>
      <PROPERTY name="avg-io-size" units="KB" type="string">82.94KB</PROPERTY>
      <PROPERTY name="avg-io-size-numeric" type="string">82944</PROPERTY>
      <PROPERTY name="avg-read-io-size" units="KB" type="string">49.15KB</PROPERTY>
      <PROPERTY name="avg-read-io-size-numeric" type="string">49152</PROPERTY>
      <PROPERTY name="avg-write-io-size" units="KB" type="string">91.13KB</PROPERTY>
      <PROPERTY name="avg-write-io-size-numeric" type="string">91136</PROPERTY>
      <PROPERTY name="number-of-disk-errors" type="uint64">0</PROPERTY>
```

```
      <PROPERTY name="sample-time" type="string">2012-02-15 10:30:00</PROPERTY>
      <PROPERTY name="sample-time-numeric" type="string">1329301800</PROPERTY>
    </OBJECT>
...
```

disk-statistics

Properties

Table 23 disk-statistics properties

Name	Type	Description
durable-id	string	Disk ID in the form disk_*enclosure-number.disk-number*.
serial-number	string	Disk serial number.
bytes-per-second	string	Data transfer rate calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	string	Unformatted bytes-per-second value.
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
number-of-reads	uint64	Number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	Number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	string	Unformatted data-read value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	string	Unformatted data-written value.
queue-depth	uint32	Number of pending I/O operations currently being serviced.
reset-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	string	Unformatted reset-time value.
start-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling started for the iops and bytes-per-second values.
start-sample-time-numeric	string	Unformatted start-sample-time value.
stop-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling stopped for the iops and bytes-per-second values.
stop-sample-time-numeric	string	Unformatted stop-sample-time value.
smart-count-1	uint32	For port 1, the number of SMART events recorded.
io-timeout-count-1	uint32	For port 1, the number of timeouts accessing the disk.
no-response-count-1	uint32	For port 1, the number of times the disk did not respond.
spinup-retry-count-1	uint32	For port 1, the number of attempts by the storage system to spin up the disk.

Table 23 disk-statistics properties (continued)

Name	Type	Description
number-of-media-errors-1	uint32	For port 1, the number of media errors generated by the disk, as specified by its manufacturer.
number-of-nonmedia-errors-1	uint32	For port 1, the number of other errors generated by the storage system, or generated by the disk and not categorized as media errors.
number-of-block-reassigns-1	uint32	For port 1, the number of times blocks were reassigned to alternate locations.
number-of-bad-blocks-1	uint32	For port 1, the number of bad blocks encountered.
smart-count-2	uint32	For port 2, the number of pending I/O operations currently being serviced.
io-timeout-count-2	uint32	For port 2, the number of SMART events recorded.
no-response-count-2	uint32	For port 2, the number of timeouts accessing the disk.
spinup-retry-count-2	uint32	For port 2, the number of times the disk did not respond.
number-of-media-errors-2	uint32	For port 2, the number of attempts by the storage system to spin up the disk.
number-of-nonmedia-errors-2	uint32	For port 2, the number of media errors generated by the disk, as specified by its manufacturer.
number-of-block-reassigns-2	uint32	For port 2, the number of other errors generated by the storage system, or generated by the disk and not categorized as media errors.
number-of-bad-blocks-2	uint32	For port 2, the number of times blocks were reassigned to alternate locations.

Example

```
# show disk-statistics
...
  <OBJECT basetype="disk-statistics" name="disk-statistics" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">disk_0.0</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="bytes-per-second" units="B" type="string">0B</PROPERTY>
    <PROPERTY name="bytes-per-second-numeric" type="string">0</PROPERTY>
    <PROPERTY name="iops" type="uint32">0</PROPERTY>
    <PROPERTY name="number-of-reads" type="uint64">560748</PROPERTY>
    <PROPERTY name="number-of-writes" type="uint64">141124</PROPERTY>
    <PROPERTY name="data-read" units="GB" type="string">35.03GB</PROPERTY>
    <PROPERTY name="data-read-numeric" type="string">35038771200</PROPERTY>
    <PROPERTY name="data-written" units="GB" type="string">508.20GB</PROPERTY>
    <PROPERTY name="data-written-numeric" type="string">508206256640</PROPERTY>
    <PROPERTY name="queue-depth" type="uint32">0</PROPERTY>
    <PROPERTY name="reset-time" type="string">2012-02-13 12:45:16</PROPERTY>
    <PROPERTY name="reset-time-numeric" type="string">1329137116</PROPERTY>
    <PROPERTY name="start-sample-time" type="string">2012-02-24 12:47:34</PROPERTY>
    <PROPERTY name="start-sample-time-numeric" type="string">1330087654</PROPERTY>
    <PROPERTY name="stop-sample-time" type="string">2012-02-29 10:19:57</PROPERTY>
    <PROPERTY name="stop-sample-time-numeric" type="string">1330510797</PROPERTY>
    <PROPERTY name="smart-count-1" type="uint32">0</PROPERTY>
    <PROPERTY name="io-timeout-count-1" type="uint32">0</PROPERTY>
    <PROPERTY name="no-response-count-1" type="uint32">0</PROPERTY>
    <PROPERTY name="spinup-retry-count-1" type="uint32">0</PROPERTY>
```

```
    <PROPERTY name="number-of-media-errors-1" type="uint32">0</PROPERTY>
    <PROPERTY name="number-of-nonmedia-errors-1" type="uint32">22</PROPERTY>
    <PROPERTY name="number-of-block-reassigns-1" type="uint32">0</PROPERTY>
    <PROPERTY name="number-of-bad-blocks-1" type="uint32">0</PROPERTY>
    <PROPERTY name="smart-count-2" type="uint32">0</PROPERTY>
    <PROPERTY name="io-timeout-count-2" type="uint32">0</PROPERTY>
    <PROPERTY name="no-response-count-2" type="uint32">0</PROPERTY>
    <PROPERTY name="spinup-retry-count-2" type="uint32">0</PROPERTY>
    <PROPERTY name="number-of-media-errors-2" type="uint32">0</PROPERTY>
    <PROPERTY name="number-of-nonmedia-errors-2" type="uint32">1</PROPERTY>
    <PROPERTY name="number-of-block-reassigns-2" type="uint32">0</PROPERTY>
    <PROPERTY name="number-of-bad-blocks-2" type="uint32">0</PROPERTY>
  </OBJECT>
...
```

drive-parameters

Properties

Table 24 drive-parameters properties

Name	Type	Description
smart	string	Shows whether SMART (Self-Monitoring Analysis and Reporting Technology) is enabled or disabled for disks. • Detect-Only: Each disk in the system retains its individual SMART setting, as will new disks added to the system. • Enabled: SMART is enabled for all disks in the system and will be enabled for new disks added to the system. This is the default. • Disabled: SMART is disabled for all disks in the system and will be disabled for new disks added to the system.
smart-numeric	string	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 parameter cannot be changed.
drive-write-back-cache-numeric	string	Numeric equivalents for drive-write-back-cache values. • 0: Detect-Only • 1: Enabled • 2: Disabled
drive-timeout-retry-max	uint8	Maximum number of times a timed-out I/O operation can be retried before the operation is failed. The default is 3.
drive-attempt-timeout	uint8	Number of seconds before an I/O operation is aborted and possibly retried. The default is 8 seconds.
drive-overall-timeout	uint8	Total time in seconds before an I/O operation is failed regardless of the drive-attempt-timeout and drive-timeout-retry-max settings. The default is 105 seconds.
disk-dsd-enable	string	Shows whether available disks and global spares will spin down after a period of inactivity shown by the disk-dsd-delay property. • Disabled: Drive spin down for available disks and global spares is disabled. This is the default. • Enabled: Drive spin down for available disks and global spares is enabled.
disk-dsd-enable-numeric	string	Numeric equivalents for disk-dsd-enable values. • 0: Disabled • 1: Enabled
disk-dsd-enable-pool	string	Not applicable.
disk-dsd-enable-pool-numeric	string	Not applicable.

Table 24 drive-parameters properties (continued)

Name	Type	Description
disk-dsd-delay	uint16	Shows the period of inactivity in minutes after which available disks and global spares will spin down, from 1–360 minutes. The default is 15 minutes. The value 0 means spin down is disabled.
disk-dsd-enable-pool-numeric	string	Not applicable.

Example

```
# show disk-parameters
...
  <OBJECT basetype="drive-parameters" name="drive-parameters" oid="1" format="pairs">
    <PROPERTY name="smart" type="string">Enabled</PROPERTY>
    <PROPERTY name="smart-numeric" type="string">1</PROPERTY>
    <PROPERTY name="drive-write-back-cache" type="string">Disabled</PROPERTY>
    <PROPERTY name="drive-write-back-cache-numeric" type="string">2</PROPERTY>
    <PROPERTY name="drive-timeout-retry-max" type="uint8">3</PROPERTY>
    <PROPERTY name="drive-attempt-timeout" type="uint8">8</PROPERTY>
    <PROPERTY name="drive-overall-timeout" type="uint8">105</PROPERTY>
    <PROPERTY name="disk-dsd-enable" type="string">Disabled</PROPERTY>
    <PROPERTY name="disk-dsd-enable-numeric" type="string">0</PROPERTY>
    <PROPERTY name="disk-dsd-enable-pool" type="string">Disabled</PROPERTY>
    <PROPERTY name="disk-dsd-enable-pool-numeric" type="string">0</PROPERTY>
    <PROPERTY name="disk-dsd-delay" type="uint16">0</PROPERTY>
    <PROPERTY name="disk-dsd-delay-pool" type="uint16">0</PROPERTY>
  </OBJECT>
...
```

drive-summary

Properties

Table 25 drive-summary properties

Name	Type	Description
durable-id	string	Disk ID in the form disk_*enclosure-number.disk-number*.
serial-number	string	Disk serial number.

Example

```
# show disk-statistics 1.1 historical
...
  <OBJECT basetype="drive-summary" name="drive" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">disk_1.1</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
  ...
  </OBJECT>
...
```

Embedded basetypes

- disk-hist-statistics

drives

Properties

Table 26 drives properties

Name	Type	Description
durable-id	string	Disk ID in the form disk_*enclosure-ID.slot-number*.
enclosure-id	uint32	Enclosure ID.
slot	uint32	Disk slot number.
location	string	Disk's enclosure ID and slot number.
port	uint32	For internal use only.
scsi-id	uint32	SCSI ID assigned to this disk for the primary channel.
blocks	uint64	Unformatted size value in 512-byte blocks.
serial-number	string	Disk serial number.
vendor	string	Disk vendor.
model	string	Disk model.
revision	string	Disk firmware revision level.
state	string	Shows the disk's state or usage. • AVAIL: The disk is available. • FAILED: The disk is unusable and must be replaced. Reasons for this status include: excessive media errors; SMART error; disk hardware failure; unsupported disk. • GLOBAL SP: The disk is a global spare. • LEFTOVR: The disk is a leftover and can be reused after its metadata is cleared. • VDISK: The disk is used in a vdisk. • VDISK SP: The disk is a spare assigned to a vdisk.
secondary-channel	uint32	SCSI ID assigned to this disk for the secondary channel.
container-index	uint32	Container index.
member-index	uint32	Index for this disk in the vdisk list.
type	string	Type of disk interface. • SAS: Dual-port SAS. • SAS-S: Single-port SAS. • SATA: Dual-port SATA. • SATA-S: Single-port SATA. • sSATA: Dual-port SATA SSD. • sSAS: Dual-port SAS SSD.
type-numeric	string	Numeric equivalents for type values. • 3: SATA • 4: SAS • 5: SATA-S • 6: SAS-S • 7: sSATA • 8: sSAS
pi-format	string	Not applicable.

Table 26 drives properties (continued)

Name	Type	Description
pi-format-numeric	string	Not applicable.
job-running	string	Job running on the disk, if any. • (blank): None. • DRSC: The disk is being scrubbed. • EXPD: The vdisk is being expanded. • INIT: The vdisk is being initialized. • RCON: The vdisk is being reconstructed. • VRFY: The vdisk is being verified. • VRSC: The vdisk is being scrubbed.
job-running-numeric	string	Numeric equivalents for job-running values. • 0: None • 2: INIT • 3: RCON • 4: VRFY • 5: EXPD • 6: VRSC • 7: DRSC
blink	uint32	• 0: The disk's locator LED is not illuminated. • 1: The disk's locator LED is illuminated.
speed	uint32	Not used.
lun	uint32	Not used.
smart	string	• Disabled: SMART is disabled for this disk. • Enabled: SMART is enabled for this disk.
smart-numeric	string	Numeric equivalents for smart values. • 0: Disabled • 1: Enabled
dual-port	uint32	• 0: Single-ported disk. • 1: Dual-ported disk.
error	uint32	Not used.
fc-p1-channel	uint32	Port 1 channel ID.
fc-p1-device-id	uint32	Port 1 device ID.
fc-p1-node-wwn	string	Port 1 WWNN.
fc-p1-port-wwn	string	Port 1 WWPN.
fc-p1-unit-number	uint32	Port 1 unit number.
fc-p2-channel	uint32	Port 2 channel number.
fc-p2-device-id	uint32	Port 2 device ID.
fc-p2-node-wwn	string	Port 2 WWNN.
fc-p2-port-wwn	string	Port 2 WWPN.
fc-p2-unit-number	uint32	Port 2 unit number.
drive-down-code	uint8	Numeric code indicating why the disk is down.

Table 26 drives properties (continued)

Name	Type	Description
owner	string	Current owner, which is either the preferred owner during normal operation or the partner controller when the preferred owner is offline. • A: Controller A. • B: Controller B.
owner-numeric	string	Numeric equivalents for owner values. • 0: B • 1: A
index	uint32	For internal use only.
rpm	uint32	Disk RPM in units of1000, as specified by the vendor.
size	string	Disk capacity, formatted to use the current base, precision, and units.
size-numeric	string	Unformatted size value in 512-byte blocks.
transfer-rate	string	Disk data-transfer rate in Gbit/second (Gbps). • 1.5 • 3.0 • 6.0 Some 6-Gbps disks might not consistently support a 6-Gbps transfer rate. If this happens, the controller automatically adjusts transfers to those disks to 3 Gbps, increasing reliability and reducing error messages with little impact on system performance. This rate adjustment persists until the controller is restarted or power-cycled.
transfer-rate-numeric	string	For internal use only.
attributes	string	Shows which controller a single-ported disk is connected to. • A: Controller A. • B: Controller B.
attributes-numeric	string	For internal use only.
virtual-disk-serial	string	Serial number of the disk's vdisk, if any.
enclosure-wwn	string	Enclosure WWN.
status	string	Disk status. • Up: The disk is present and is properly communicating with the expander. • Spun Down: The disk is present and has been spun down by the drive spin down feature. • Warning: The disk is present but the system is having communication problems with the disk LED processor. For disk and midplane types where this processor also controls power to the disk, power-on failure will result in Error status. • Error: The disk is present but is not detected by the expander. • Unknown: Initial status when the disk is first detected or powered on. • Not Present: The disk slot indicates that no disk is present.
usage	string	Not applicable.
operation	string	Not applicable.

Table 26 drives properties (continued)

Name	Type	Description
led-status	string	Disk LED status. • Rebuild: The disk's vdisk is being reconstructed. • Fault: The disk has a fault. • ID: The locator LED is illuminated to identify the disk. • Remove: The disk is ready to be removed from the enclosure.
led-status-numeric	string	Numeric equivalents for led-status values. • 1: Online • 2: Rebuild • 4: Fault • 8: Pred Fail • 16: ID • 32: Remove
disk-dsd-count	uint32	Number of times the DSD feature has spun down this disk.
number-of-ios	uint64	Total I/Os
total-data-transferred	bytes	Total bytes transferred
total-data-transferred-numeric	uint64	Unformatted total-data-transferred value.
avg-rsp-time	uint64	Average I/O response time in microseconds.
health	string	Disk health. • OK • Degraded • Fault • Unknown • N/A
health-numeric	string	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.

Example

```
# show disks
...
  <OBJECT basetype="drives" name="drive" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">disk_0.0</PROPERTY>
    <PROPERTY name="enclosure-id" type="uint32">0</PROPERTY>
    <PROPERTY name="slot" type="uint32">0</PROPERTY>
    <PROPERTY name="location" key="true" type="string">0.0</PROPERTY>
    <PROPERTY name="port" type="uint32">0</PROPERTY>
    <PROPERTY name="scsi-id" type="uint32">0</PROPERTY>
    <PROPERTY name="blocks" blocksize="512" type="uint64">976773168</PROPERTY>
    <PROPERTY name="serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="vendor" type="string">HP</PROPERTY>
```

```
    <PROPERTY name="model" type="string">MM0500FAMYT</PROPERTY>
    <PROPERTY name="revision" type="string">HPD4</PROPERTY>
    <PROPERTY name="state" type="string">VDISK</PROPERTY>
    <PROPERTY name="secondary-channel" type="uint32">1</PROPERTY>
    <PROPERTY name="container-index" type="uint32">0</PROPERTY>
    <PROPERTY name="member-index" type="uint32">0</PROPERTY>
    <PROPERTY name="type" type="string">SAS</PROPERTY>
    <PROPERTY name="type-numeric" type="string">4</PROPERTY>
    <PROPERTY name="pi-format" type="string">UNKN</PROPERTY>
    <PROPERTY name="pi-format-numeric" type="string">3</PROPERTY>
    <PROPERTY name="job-running" type="string"></PROPERTY>
    <PROPERTY name="job-running-numeric" type="string">0</PROPERTY>
    <PROPERTY name="blink" type="uint32">0</PROPERTY>
    <PROPERTY name="speed" type="uint32">0</PROPERTY>
    <PROPERTY name="lun" type="uint32">0</PROPERTY>
    <PROPERTY name="smart" type="string">Enabled</PROPERTY>
    <PROPERTY name="smart-numeric" type="string">1</PROPERTY>
    <PROPERTY name="dual-port" type="uint32">1</PROPERTY>
    <PROPERTY name="error" type="uint32">0</PROPERTY>
    <PROPERTY name="fc-p1-channel" type="uint32">0</PROPERTY>
    <PROPERTY name="fc-p1-device-id" type="uint32">0</PROPERTY>
    <PROPERTY name="fc-p1-node-wwn" type="string">5000c5000d713053</PROPERTY>
    <PROPERTY name="fc-p1-port-wwn" type="string">0000000000000000</PROPERTY>
    <PROPERTY name="fc-p1-unit-number" type="uint32">0</PROPERTY>
    <PROPERTY name="fc-p2-channel" type="uint32">1</PROPERTY>
    <PROPERTY name="fc-p2-device-id" type="uint32">0</PROPERTY>
    <PROPERTY name="fc-p2-node-wwn" type="string"></PROPERTY>
    <PROPERTY name="fc-p2-port-wwn" type="string"></PROPERTY>
    <PROPERTY name="fc-p2-unit-number" type="uint32">0</PROPERTY>
    <PROPERTY name="drive-down-code" type="uint8">0</PROPERTY>
    <PROPERTY name="owner" type="string">A</PROPERTY>
    <PROPERTY name="owner-numeric" type="string">1</PROPERTY>
    <PROPERTY name="index" type="uint32">0</PROPERTY>
    <PROPERTY name="rpm" units="K" type="uint32">7</PROPERTY>
    <PROPERTY name="size" units="GB" type="string">500.10GB</PROPERTY>
    <PROPERTY name="size-numeric" units="blocks512" type="string">976773168</PROPERTY>
    <PROPERTY name="transfer-rate" units="gbps" type="string">6.0</PROPERTY>
    <PROPERTY name="transfer-rate-numeric" units="gbps" type="string">19</PROPERTY>
    <PROPERTY name="attributes" type="string"></PROPERTY>
    <PROPERTY name="attributes-numeric" type="string">19</PROPERTY>
    <PROPERTY name="virtual-disk-serial" type="string">SN</PROPERTY>
    <PROPERTY name="enclosure-wwn" type="string">500c0ff0daa4943c</PROPERTY>
    <PROPERTY name="status" type="string">Up</PROPERTY>
    <PROPERTY name="usage" type="string">VDISK</PROPERTY>
    <PROPERTY name="operation" type="string">POOL</PROPERTY>
    <PROPERTY name="led-status" type="string"> Online</PROPERTY>
    <PROPERTY name="led-status-numeric" type="string">1</PROPERTY>
    <PROPERTY name="disk-dsd-count" type="uint32">1</PROPERTY>
    <PROPERTY name="number-of-ios" type="uint64">0</PROPERTY>
    <PROPERTY name="total-data-transferred" units="B" type="string">0B</PROPERTY>
    <PROPERTY name="total-data-transferred-numeric" type="string">0</PROPERTY>
    <PROPERTY name="avg-rsp-time" type="uint64">0</PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
  </OBJECT>
...
```

email-parameters

Properties

Table 27 email-parameters properties

Name	Type	Description
email-notification	string	Shows whether email (SMTP) notification of events is enabled. • Disabled: Email notification is disabled. This is the default. • Enabled: Email notification is enabled.
email-notification-numeric	string	Numeric equivalents for email-notification values. • 0: Disabled • 1: Enabled
email-notification-filter	string	The minimum severity for which the system should send notifications: • crit: Sends notifications for Critical events only. • error: Sends notifications for Error and Critical events. • warn: Sends notifications for Warning, Error, and Critical events. • info: Sends notifications for all events. • none: Disables email notification. This is the default. This parameter does not apply to managed-logs notifications.
email-notification-filter-numeric	string	Numeric equivalents for email-notification-filter values. • 8: crit • 4: error • 2: warn • 1: info • 0: none
email-notify-address-1	string	Up to three email addresses for recipients of event notifications. Blank by default.
email-notify-address-2	string	
email-notify-address-3	string	
email-notify-address-4	string	Shows the email address for the log-collection system used by the log-management feature. Blank by default.
email-server	string	The IP address of the SMTP mail server to use for the email messages. Blank by default.
email-domain	string	The domain name that, with the sender name, forms the “from” address for remote notification. Blank by default.
email-sender	string	The sender name that, with the domain name, forms the “from” address for remote notification. Blank by default.
include-logs	string	Shows whether system log files will automatically be attached for email notification messages generated by the log-management feature. This is the “push” mode of log management. This option is disabled by default.
include-logs-numeric	string	Numeric equivalents for include-logs values. • 0: Disabled • 1: Enabled

Example

```
# show email-parameters
...
  <OBJECT basetype="email-parameters" name="email-parameters" oid="1" format="pairs">
    <PROPERTY name="email-notification" type="string">Enabled</PROPERTY>
    <PROPERTY name="email-notification-numeric" type="string">1</PROPERTY>
    <PROPERTY name="email-notification-filter" type="string">error</PROPERTY>
    <PROPERTY name="email-notification-filter-numeric" type="string">12</PROPERTY>
    <PROPERTY name="email-notify-address-1" type="string">admin@mycompany.com</PROPERTY>
    <PROPERTY name="email-notify-address-2" type="string"></PROPERTY>
    <PROPERTY name="email-notify-address-3" type="string"></PROPERTY>
    <PROPERTY name="email-notify-address-4" type="string"></PROPERTY>
    <PROPERTY name="email-server" type="string">10.64.10.105</PROPERTY>
    <PROPERTY name="email-domain" type="string">mycompany.com</PROPERTY>
    <PROPERTY name="email-sender" type="string">system</PROPERTY>
    <PROPERTY name="email-include-logs" type="string">Disabled</PROPERTY>
    <PROPERTY name="email-include-logs-numeric" type="string">0</PROPERTY>
  </OBJECT>
...
```

enclosure-components

Properties

Table 28 enclosure-components properties

Name	Type	Description
type	string	Component type. • FAN: Cooling fan unit. • PSU: Power supply unit. • Temp: Temperature sensor. • Voltage: Voltage sensor. • Disk: Disk drive module.
enclosure-unit-number	string	Component ID.
status	string	Component status. • Absent: The component is not present. • Error: The component or at least one subcomponent has failed. • Warning: The component or at least one subcomponent is not working normally. • OK: The component and any subcomponents are working normally. Temperature status OK indicates that the sensor is working properly, not that the temperature is within an acceptable range. • N/A: Status is not available.
fru-partnnumber	string	Part number of the field-replaceable unit (FRU) that contains the component.
fru_serialnumber	string	Serial number of the FRU that contains the component.
additional-data	string	Additional data, if applicable. • addr=: For a disk, the slot address. • temp=: For a temperature sensor, the temperature. • voltage=: For a voltage sensor, the voltage. • --: No data.

Example

```
# show enclosure-status
...
  <OBJECT basetype="enclosure-components" name="enclosure-component" oid="6"
format="rows">
    <PROPERTY name="type" type="string">Temp</PROPERTY>
    <PROPERTY name="enclosure-unit-number" type="string">01</PROPERTY>
    <PROPERTY name="status" type="string">OK</PROPERTY>
    <PROPERTY name="fru-partnnumber" type="string">PN</PROPERTY>
    <PROPERTY name="fru_serialnumber" type="string">SN</PROPERTY>
    <PROPERTY name="additional-data" type="string">temp=37 C</PROPERTY>
  </OBJECT>
...
```

enclosure-fru

Properties

Table 29 enclosure-fru properties

Name	Type	Description
name	string	FRU name. • CHASSIS_MIDPLANE: 2U chassis and midplane circuit board. • RAID_IOM: Controller module. • IOM: Expansion module. • POWER_SUPPLY: Power supply module.
description	string	FRU long description.
part-number	string	FRU part number.
serial-number	string	FRU serial number.
revision	string	FRU hardware revision level.
dash-level	string	FRU template revision number.
fru-shortname	string	FRU short description.
mfg-date	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when a PCBA was programmed or a power supply module was manufactured.
mfg-date-numeric	string	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.
fru-location	string	Location of the FRU in the enclosure. • MID-PLANE SLOT: Chassis midplane. • UPPER IOM SLOT: Controller module or expansion module A. • LOWER IOM SLOT: Controller module or expansion module B. • LEFT PSU SLOT: Power supply module on the left, as viewed from the back. • RIGHT PSU SLOT: Power supply module on the right, as viewed from the back.
configuration-serialnumber	string	Configuration serial number.
fru-status	string	FRU status. • Absent: Component is not present. • Fault: At least one subcomponent has a fault. • OK: All subcomponents are operating normally. • Not Available: Status is not available.
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.

Example

```
# show frus
...
  <OBJECT basetype="enclosure-fru" name="fru" oid="1" format="pairs">
    <PROPERTY name="name" type="string">CHASSIS_MIDPLANE</PROPERTY>
    <PROPERTY name="description" type="string">description</PROPERTY>
    <PROPERTY name="part-number" type="string">PN</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="revision" type="string">01</PROPERTY>
    <PROPERTY name="dash-level" type="string"></PROPERTY>
    <PROPERTY name="fru-shortname" type="string">Midplane/Chassis</PROPERTY>
    <PROPERTY name="mfg-date" type="string">2011-11-01 22:14:57</PROPERTY>
    <PROPERTY name="mfg-date-numeric" type="string">1320185697</PROPERTY>
    <PROPERTY name="mfg-location" type="string">Longmont, CO, USA</PROPERTY>
    <PROPERTY name="mfg-vendor-id" key="true" type="string">0x03FD</PROPERTY>
    <PROPERTY name="fru-location" type="string">MID-PLANE SLOT</PROPERTY>
    <PROPERTY name="configuration-serialnumber" type="string">SN</PROPERTY>
    <PROPERTY name="fru-status" type="string">OK</PROPERTY>
    <PROPERTY name="original-serialnumber" type="string"></PROPERTY>
    <PROPERTY name="original-partnumber" type="string"></PROPERTY>
    <PROPERTY name="original-revision" type="string"></PROPERTY>
  </OBJECT>
...
```

enclosure-list

Properties

Table 30 enclosure-list properties

Name	Type	Description
status	string	Disk slot status. • Up: The disk is present and is properly communicating with the expander. • Spun Down: The disk is present and has been spun down by the drive spin down feature. • Warning: The disk is present but the system is having communication problems with the disk LED processor. For disk and midplane types where this processor also controls power to the disk, power-on failure will result in Error status. • Error: The disk is present but is not detected by the expander. • Unknown: Initial status when the disk is first detected or powered on. • Not Present: The disk slot indicates that no disk is present.
status-numeric	string	Numeric equivalents for status values. • 1: Up • 2: Error • 3: Warning • 5: Not Present • 6: Unknown • 20: Spun Down
enclosure-id	uint32	Enclosure ID.
slot	uint32	Disk slot number.
vendor	string	Disk vendor.
model	string	Disk model.
serial-number	string	Disk serial number.
size	string	Disk capacity, formatted to use the current base, precision, and units.
size-numeric	string	Unformatted size value in 512-byte blocks.

Example

```
# show disks encl
...
  <OBJECT basetype="enclosure-list" name="drive" oid="1" format="rows">
    <PROPERTY name="status" type="string">Up</PROPERTY>
    <PROPERTY name="status-numeric" type="string">1</PROPERTY>
    <PROPERTY name="enclosure-id" type="uint32">1</PROPERTY>
    <PROPERTY name="slot" type="uint32">1</PROPERTY>
    <PROPERTY name="vendor" type="string">HP</PROPERTY>
    <PROPERTY name="model" type="string">MM0500FAMYT</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="size" units="GB" type="string">500.10GB</PROPERTY>
    <PROPERTY name="size-numeric" units="blocks512" type="string">976773168</PROPERTY>
  </OBJECT>
...
```

enclosures

Properties

Table 31 enclosures properties

Name	Type	Description
durable-id	string	Enclosure ID in the form enclosure_*number*.
enclosure-id	uint8	Enclosure ID.
enclosure-wwn	string	Enclosure WWN.
name	string	Enclosure name.
location	string	Enclosure location; blank if not set.
rack-number	uint8	Number of the rack containing the enclosure.
rack-position	uint8	Position of the enclosure in the rack.
number-of-coolings-elements	uint8	Number of fan units in the enclosure.
number-of-disks	uint8	Number of disk slots (not installed disks) in the enclosure.
number-of-power-supplies	uint8	Number of power supplies in the enclosure.
status	string	Disk slot status. • Unsupported • Up • Error • Warning • Unrecoverable • Not Present • Unknown • Unavailable • Spun Down
status-numeric	string	Numeric equivalents for status values. • 0: Unsupported • 1: Up • 2: Error • 3: Warning • 4: Unrecoverable • 5: Not Present • 6: Unknown • 7: Unavailable • 20: Spun Down
midplane-serial-number	string	Midplane serial number.
vendor	string	Enclosure vendor.
model	string	Enclosure model.
fru-shortname	string	FRU short description.
fru-location	string	FRU location. • MID-PLANE SLOT: Chassis midplane. • (blank): Not applicable.

Table 31 enclosures properties (continued)

Name	Type	Description
part-number	string	FRU part number.
mfg-date	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when a PCBA was programmed or a power supply module was manufactured.
mfg-date-numeric	string	Unformatted mfg-date value.
mfg-location	string	City, state/province, and country where the FRU was manufactured.
description	string	FRU long description.
revision	string	Hardware revision level for the FRU.
dash-level	string	FRU template revision number.
emp-a-rev	string	Firmware revision of controller A's EMP.
emp-b-rev	string	Firmware revision of controller B's EMP.
rows	uint8	Number of rows of disk slots.
columns	uint8	Number of columns of disk slots.
slots	uint8	Number of disk slots in this enclosure
drive-orientation	string	• vertical: Disks are oriented vertically. • horizontal: Disks are oriented horizontally.
drive-orientation-numeric	string	Numeric equivalents for drive-orientation values. • 0: vertical • 1: horizontal
enclosure-arrangement	string	• vertical: Disks are numbered vertically (by column from top to bottom, proceeding rightward). • horizontal: Disks are numbered horizontally (by row from left to right. proceeding downward).
enclosure-arrangement-numeric	string	Numeric equivalents for enclosure-arrangement values. • 0: vertical • 1: horizontal
emp-a-busid	string	SCSI channel ID of controller A's EMP.
emp-a-targetid	string	SCSI target ID of controller A's EMP.
emp-b-busid	string	SCSI channel ID of controller B's EMP.
emp-b-targetid	string	SCSI target ID of controller B's EMP.
emp-a	string	Shows the field name EMP A in console format.
emp-a-ch-id-rev	string	SCSI address and firmware revision of controller A's EMP.
emp-b	string	Shows the field name EMP B in console format.
emp-b-ch-id-rev	string	SCSI address and firmware revision of controller B's EMP.

Table 31 enclosures properties (continued)

Name	Type	Description
midplane-type	string	Enclosure midplane type. • 2U24-6Gv2: Midplane for 2U, reduced-depth, 24-disk enclosure with 6-Gbps maximum data rate to disks. • 2U24-6G: Midplane for 2U, 24-disk enclosure with 6-Gbps maximum data rate to disks. • 2U24-3G: Midplane for 2U, 24-disk enclosure with 3-Gbps maximum data rate to disks. • 2U12-6Gv2: Midplane for 2U, reduced-depth, 12-disk enclosure with 6-Gbps maximum data rate to disks. • 2U12-6G: Midplane for 2U, 12-disk enclosure with 6-Gbps maximum data rate to disks. • 2U12-3G: Midplane for 2U, 12-disk enclosure with 3-Gbps maximum data rate to disks. • N/A: Other type of midplane.
midplane-type-numeric	string	Numeric equivalents for midplane-type values. • 0: 2U12-3G • 1: 2U24-3G • 2: 2U12-6G • 3: 2U24-6G • 5, 9, 13: 2U24-6Gv2 • 6, 10: 2U12-6Gv2
enclosure-power	string	Enclosure power in watts.
pcie2-capable	string	• False: Enclosure is not capable of using PCI Express version 2. • True: Enclosure is capable of using PCI Express version 2.
pcie2-capable-numeric	string	Numeric equivalents for pcie2-capable values. • 0: False • 1: True
health	string	• OK • Degraded • Fault • Unknown
health-numeric	string	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.

Example

```
# show enclosures
...
  <OBJECT basetype="enclosures" name="enclosures" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">enclosure_1</PROPERTY>
    <PROPERTY name="enclosure-id" type="uint8">1</PROPERTY>
    <PROPERTY name="enclosure-wwn" type="string">500c0ff0daa4943c</PROPERTY>
    <PROPERTY name="name" type="string"></PROPERTY>
    <PROPERTY name="location" type="string"></PROPERTY>
    <PROPERTY name="rack-number" type="uint8">0</PROPERTY>
```

```
    <PROPERTY name="rack-position" type="uint8">0</PROPERTY>
    <PROPERTY name="number-of-coolings-elements" type="uint8">2</PROPERTY>
    <PROPERTY name="number-of-disks" type="uint8">24</PROPERTY>
    <PROPERTY name="number-of-power-supplies" type="uint8">2</PROPERTY>
    <PROPERTY name="status" type="string">Up</PROPERTY>
    <PROPERTY name="status-numeric" type="string">1</PROPERTY>
    <PROPERTY name="midplane-serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="vendor" type="string">vendor</PROPERTY>
    <PROPERTY name="model" type="string">model</PROPERTY>
    <PROPERTY name="fru-shortname" type="string">Midplane/Chassis</PROPERTY>
    <PROPERTY name="fru-location" type="string">MID-PLANE SLOT</PROPERTY>
    <PROPERTY name="part-number" type="string">582939-001</PROPERTY>
    <PROPERTY name="mfg-date" type="string">2011-11-01 22:14:57</PROPERTY>
    <PROPERTY name="mfg-date-numeric" type="string">1320185697</PROPERTY>
    <PROPERTY name="mfg-location" type="string">Longmont, CO, USA</PROPERTY>
    <PROPERTY name="description" type="string">description</PROPERTY>
    <PROPERTY name="revision" type="string">01</PROPERTY>
    <PROPERTY name="dash-level" type="string"></PROPERTY>
    <PROPERTY name="emp-a-rev" type="string">2018</PROPERTY>
    <PROPERTY name="emp-b-rev" type="string">2018</PROPERTY>
    <PROPERTY name="rows" type="uint8">1</PROPERTY>
    <PROPERTY name="columns" type="uint8">24</PROPERTY>
    <PROPERTY name="slots" type="uint8">24</PROPERTY>
    <PROPERTY name="drive-orientation" type="string">vertical</PROPERTY>
    <PROPERTY name="drive-orientation-numeric" type="string">0</PROPERTY>
    <PROPERTY name="enclosure-arrangement" type="string">vertical</PROPERTY>
    <PROPERTY name="enclosure-arrangement-numeric" type="string">0</PROPERTY>
    <PROPERTY name="emp-a-busid" type="string">00</PROPERTY>
    <PROPERTY name="emp-a-targetid" type="string">031</PROPERTY>
    <PROPERTY name="emp-b-busid" type="string">01</PROPERTY>
    <PROPERTY name="emp-b-targetid" type="string">031</PROPERTY>
    <PROPERTY name="emp-a" type="string"></PROPERTY>
    <PROPERTY name="emp-a-ch-id-rev" type="string">00:031 2018</PROPERTY>
    <PROPERTY name="emp-b" type="string"></PROPERTY>
    <PROPERTY name="emp-b-ch-id-rev" type="string">01:031 2018</PROPERTY>
    <PROPERTY name="midplane-type" type="string">2U24-6G</PROPERTY>
    <PROPERTY name="midplane-type-numeric" type="string">3</PROPERTY>
    <PROPERTY name="enclosure-power" type="string">136.78</PROPERTY>
    <PROPERTY name="pcie2-capable" type="string">False</PROPERTY>
    <PROPERTY name="pcie2-capable-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
    ...
  </OBJECT>
...
```

Embedded basetypes

- unhealthy-component
- controllers
- io-modules
- power-supplies
- fan

enclosure-sku

Properties

Table 32 enclosure-sku properties

Name	Type	Description
sku-partnumber	string	System part number.
sku_serialnumber	string	System serial number.
sku-revision	string	System revision level.

Example

Not applicable.

events

Properties

Table 33 events properties

Name	Type	Description
time-stamp	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when this event was detected.
time-stamp-numeric	string	Unformatted time-stamp value.
event-code	string	Event code. For event-code descriptions, see the Event Descriptions Reference Guide.
event-id	string	Event ID.
model	string	Controller model.
serial-number	string	Controller serial number.
controller	string	• A: Controller A. • B: Controller B.
controller-numeric	string	Numeric equivalents for controller values. • 0: B • 1: A
severity	string	Event severity. • CRITICAL: A failure occurred that may cause a controller to shut down. Correct the problem *immediately*. • ERROR: A failure occurred that may affect data integrity or system stability. Correct the problem as soon as possible. • WARNING: A problem occurred that may affect system stability but not data integrity. Evaluate the problem and correct it if necessary. • INFORMATIONAL: A configuration or state change occurred, or a problem occurred that the system corrected. No action is required.
severity-numeric	string	Numeric equivalents for severity values. • 0: INFORMATIONAL • 1: WARNING • 2: ERROR • 3: CRITICAL
message	string	Brief description of the event that occurred. For some events, the message includes data about affected components.
additional-information	string	Shows additional information, if available, about the event.
recommended-action	string	Recommends actions to take, if any, to resolve the issue reported by the event.

Example

```
# show events
...
  <OBJECT basetype="events" name="event" oid="2" format="packed">
    <PROPERTY name="time-stamp" type="string">2012-02-15 12:50:09</PROPERTY>
    <PROPERTY name="time-stamp-numeric" type="string">1329310209</PROPERTY>
    <PROPERTY name="event-code" type="string">19</PROPERTY>
    <PROPERTY name="event-id" type="string">A13517</PROPERTY>
    <PROPERTY name="model" type="string">model</PROPERTY>
    <PROPERTY name="serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="controller" type="string">A</PROPERTY>
```

```
    <PROPERTY name="controller-numeric" type="string">1</PROPERTY>
    <PROPERTY name="severity" type="string">INFORMATIONAL</PROPERTY>
    <PROPERTY name="severity-numeric" type="string">0</PROPERTY>
    <PROPERTY name="message" type="string">A rescan-bus operation was done. (number of
disks that were found: 45, number of enclosures that were found: 4) (rescan reason:
initiated by a user, rescan reason code: 0)</PROPERTY>
    <PROPERTY name="additional-information" type="string">None.</PROPERTY>
    <PROPERTY name="recommended-action" type="string">- No action is required.</PROPERTY>
  </OBJECT>
...
```

expander-ports

Properties

Table 34 expander-ports properties

Name	Type	Description
durable-id	string	Expander port ID.
enclosure-id	uint32	Enclosure ID.
controller	string	• A: Controller A. • B: Controller B.
controller-numeric	string	Numeric equivalents for controller values. • 0: B • 1: A
name	string	• Out Port: Egress (expansion) port on controller module or an expansion module. Can be connected to an ingress port on an expansion module. • In Port: Ingress port on an expansion module. Can be connected to an egress (expansion) port on a controller module or an expansion module.
name-numeric	string	• 2: In Port • 3: Out Port
status	string	Expander port status. • Up • Warning • Error • Not Present • Unknown • Disconnected
status-numeric	string	Numeric equivalents for status values. • 0: Up • 1: Warning • 2: Error • 3: Not Present • 4: Unknown • 6: Disconnected
health	string	• OK • Degraded • Fault • N/A • Unknown
health-numeric	string	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.

Example

```
# show sas-link-health
...
   <OBJECT basetype="expander-ports" name="expander-port" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">expport_out1_a0</PROPERTY>
    <PROPERTY name="enclosure-id" key="true" type="uint32">0</PROPERTY>
    <PROPERTY name="controller" type="string">A</PROPERTY>
    <PROPERTY name="controller-numeric" type="string">1</PROPERTY>
    <PROPERTY name="name" type="string">Out Port</PROPERTY>
    <PROPERTY name="name-numeric" type="string">3</PROPERTY>
    <PROPERTY name="status" type="string">Up</PROPERTY>
    <PROPERTY name="status-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
  </OBJECT>
...
```

fan

Properties

Table 35 fan properties

Name	Type	Description
durable-id	string	Fan unit ID in the form fan_*enclosure-ID*.*fan-number*.
name	string	Fan unit name in the form Fan loc:*position*-PSU *power-supply-ID*. The position is as viewed from the back of the enclosure.
location	string	Fan location in the form Enclosure *enclosure-ID* - *position*. The position is as viewed from the back of the enclosure.
status	string	Fan unit status. • Up • Warning • Error • Not Present • Unknown
status-numeric	string	Numeric equivalents for status values. • 0: Up • 1: Warning • 2: Error • 3: Not Present • 4: Unknown
speed	uint32	Fan speed (RPM).
position	string	Fan position, as viewed from the back of the enclosure. • Left • Right
position-numeric	string	Numeric equivalents for position values. • 0: Left • 1: Right
serial-number	string	• (blank): Not applicable.
fw-revision	string	• (blank): Not applicable.
hw-revision	string	• (blank): Not applicable.
health	string	• OK • Degraded • Fault • Unknown
health-numeric	string	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 4: Unknown
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.

Example

```
# show fans
...
  <OBJECT basetype="fan" name="fan-details" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">fan_00</PROPERTY>
    <PROPERTY name="name" type="string">Fan Loc:left-PSU 0</PROPERTY>
    <PROPERTY name="location" type="string">Enclosure 0 - Left</PROPERTY>
    <PROPERTY name="status" type="string">Up</PROPERTY>
    <PROPERTY name="status-numeric" type="string">0</PROPERTY>
    <PROPERTY name="speed" type="uint32">375</PROPERTY>
    <PROPERTY name="position" type="string">Left</PROPERTY>
    <PROPERTY name="position-numeric" type="string">0</PROPERTY>
    <PROPERTY name="serial-number" type="string"></PROPERTY>
    <PROPERTY name="fw-revision" type="string"></PROPERTY>
    <PROPERTY name="hw-revision" type="string"></PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
  </OBJECT>
...
```

fc-port

Properties

Table 36 fc-port properties

Name	Type	Description
`configured-topology`	`string`	Configured topology. • `Loop`: Fibre Channel arbitrated loop (public or private). • `Point-to-Point`: Fibre Channel point-to-point. To ensure maximum performance, this is the only option for 3XX3 models. • `Auto`: Loop preferred, otherwise point-to-point, based on the detected connection type. This is the default for 3XX0 models.
`primary-loop-id`	`string`	Primary loop ID; `0–125` or blank if not applicable.

Example

```
# show ports
...
    <OBJECT basetype="fc-port" name="port-details" oid="2" format="rows">
      <PROPERTY name="configured-topology" type="string">Loop</PROPERTY>
      <PROPERTY name="primary-loop-id" type="string">0</PROPERTY>
    </OBJECT>
...
```

host-port-statistics

Properties

Table 37 host-port-statistics properties

Name	Type	Description
durable-id	string	Host port ID in the form hostport_*controller-ID-and-port-number*.
bytes-per-second	string	Data transfer rate calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	string	Unformatted bytes-per-second value.
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
number-of-reads	uint64	Number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	Number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	string	Unformatted data-read value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	string	Unformatted data-written value.
queue-depth	uint32	The number of pending I/O operations currently being serviced.
avg-rsp-time	string	Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.
avg-read-rsp-time	string	Average response time, in microseconds, for all read operations, calculated over the interval since these statistics were last requested or reset.
avg-write-rsp-time	string	Average response time, in microseconds, for all write operations, calculated over the interval since these statistics were last requested or reset.
reset-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	string	Unformatted reset-time value.
start-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling started for the iops and bytes-per-second values.
start-sample-time-numeric	string	Unformatted start-sample-time value.
stop-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling stopped for the iops and bytes-per-second values.
stop-sample-time-numeric	string	Unformatted stop-sample-time value.

Example

```
# show host-port-statistics
...
  <OBJECT basetype="host-port-statistics" name="host-port-statistics" oid="1"
format="rows">
    <PROPERTY name="durable-id" type="string">hostport_A0</PROPERTY>
    <PROPERTY name="bytes-per-second" units="KB" type="string">68.09KB</PROPERTY>
    <PROPERTY name="bytes-per-second-numeric" type="string">68096</PROPERTY>
    <PROPERTY name="iops" type="uint32">0</PROPERTY>
    <PROPERTY name="number-of-reads" type="uint64">4644</PROPERTY>
    <PROPERTY name="number-of-writes" type="uint64">98020</PROPERTY>
    <PROPERTY name="data-read" units="MB" type="string">17.82MB</PROPERTY>
    <PROPERTY name="data-read-numeric" type="string">17821696</PROPERTY>
    <PROPERTY name="data-written" units="GB" type="string">11.80GB</PROPERTY>
    <PROPERTY name="data-written-numeric" type="string">11807576064</PROPERTY>
    <PROPERTY name="queue-depth" type="uint32">0</PROPERTY>
    <PROPERTY name="avg-rsp-time" type="uint32">227607</PROPERTY>
    <PROPERTY name="avg-read-rsp-time" type="uint32">3583</PROPERTY>
    <PROPERTY name="avg-write-rsp-time" type="uint32">238221</PROPERTY>
    <PROPERTY name="reset-time" type="string">2012-02-13 12:45:35</PROPERTY>
    <PROPERTY name="reset-time-numeric" type="string">1329137135</PROPERTY>
    <PROPERTY name="start-sample-time" type="string">2012-02-24 12:47:34</PROPERTY>
    <PROPERTY name="start-sample-time-numeric" type="string">1330087654</PROPERTY>
    <PROPERTY name="stop-sample-time" type="string">2012-02-29 10:19:57</PROPERTY>
    <PROPERTY name="stop-sample-time-numeric" type="string">1330510797</PROPERTY>
  </OBJECT>
...
```

hosts

Properties

Table 38 hosts properties

Name	Type	Description
host-id	string	FC or SAS host port WWN, or iSCSI host initiator node name (typically the IQN).
host-name	string	User-defined name of the host port, or blank.
host-discovered	string	• Yes: The host was discovered and its entry was automatically created. • No: The host entry was manually created.
host-mapped	string	• Yes: At least one volume is explicitly mapped to the host. • No: No volumes are explicitly mapped to the host.
host-profile	string	• Standard: The host allows LUN 0 to be assigned to a mapping.
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-port-bits-a	uint32	For internal use only.
host-port-bits-b	uint32	For internal use only.

Example

```
# show hosts
...
  <OBJECT basetype="hosts" name="hosts" oid="1" format="rows">
    <PROPERTY name="host-id" key="true" type="string">10000000c978526c</PROPERTY>
    <PROPERTY name="host-name" type="string">test7_hba1</PROPERTY>
    <PROPERTY name="host-discovered" type="string">Yes</PROPERTY>
    <PROPERTY name="host-mapped" type="string">Yes</PROPERTY>
    <PROPERTY name="host-profile" type="string">Standard</PROPERTY>
    <PROPERTY name="host-bus-type" type="string">FC</PROPERTY>
    <PROPERTY name="host-port-bits-a" type="uint32">3</PROPERTY>
    <PROPERTY name="host-port-bits-b" type="uint32">3</PROPERTY>
  </OBJECT>
...
```

host-view

Properties

Table 39 host-view properties

Name	Type	Description
`id`	`string`	FC or SAS host port WWN, or iSCSI host initiator node name (typically the IQN).
`hba-nickname`	`string`	User-defined name of the host port, or blank.
`host-profile`	`string`	• `Standard`: The host allows LUN 0 to be assigned to a mapping. This is the default.

Example

```
# show host-maps
...
  <OBJECT basetype="host-view" name="host-view" oid="1" format="labeled">
    <PROPERTY name="id" key="true" type="string">10000000c978526c</PROPERTY>
    <PROPERTY name="hba-nickname" type="string">test7_hba1</PROPERTY>
    <PROPERTY name="host-profile" type="string">Standard</PROPERTY>
  </OBJECT>
...
```

Embedded basetypes

- host-view-mappings

host-view-mappings

Properties

Table 40 host-view-mappings properties

Name	Type	Description
volume-name	string	Volume name.
volume-serial	string	Volume serial number.
lun	string	LUN assigned to the mapping.
access	string	Type of access assigned to the mapping. • read-write: Host has read and write access to the volume. • read-only: Host has read access to the volume. • no-access: Host is denied access to the volume.
ports	string	Controller host ports assigned to the mapping.

Example

```
# show host-maps
...
    <OBJECT basetype="host-view-mappings" name="volume-view" oid="2" format="rows">
      <PROPERTY name="volume-name" type="string">vd01_v001</PROPERTY>
      <PROPERTY name="volume-serial" type="string">SN</PROPERTY>
      <PROPERTY name="lun" type="string">1</PROPERTY>
      <PROPERTY name="access" type="string">read-write</PROPERTY>
      <PROPERTY name="ports" type="string">A0,A1,B0,B1</PROPERTY>
    </OBJECT>
...
```

inquiry

Properties

Table 41 inquiry properties

Name	Type	Description
mc-fw	string	Management Controller firmware version.
mc-loader	string	Management Controller loader firmware version.
sc-fw	string	Storage Controller firmware version.
sc-loader	string	Storage Controller loader firmware version.
serial-number	string	Controller serial number.
mac-address	string	Controller network port MAC address.
ip-address	string	Controller network port IP address.
nvram-defaults	string	For internal use only.

Example

```
# show inquiry
...
  <OBJECT basetype="inquiry" name="inquiry-controller-a" oid="2" format="pairs">
    <PROPERTY name="mc-fw" type="string">L240R017-01</PROPERTY>
    <PROPERTY name="mc-loader" type="string">2.5</PROPERTY>
    <PROPERTY name="sc-fw" type="string">T240R14e-01</PROPERTY>
    <PROPERTY name="sc-loader" type="string">23.008</PROPERTY>
    <PROPERTY name="serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="mac-address" type="string">00:C0:FF:DA:F1:00</PROPERTY>
    <PROPERTY name="ip-address" type="string">10.136.140.106</PROPERTY>
    <PROPERTY name="nvram-defaults" type="string">----</PROPERTY>
  </OBJECT>
...
```

io-modules

Properties

Table 42 io-modules properties

Name	Type	Description
durable-id	string	I/O module ID.
controller-id	string	• A: Controller A. • B: Controller B.
controller-id-numeric	string	Numeric equivalents for controller-id values. • 0: B • 1: A
name	string	FRU name.
description	string	FRU long description.
part-number	string	FRU part number.
serial-number	string	FRU serial number.
revision	string	FRU hardware revision level.
dash-level	string	FRU template revision number.
fru-shortname	string	FRU short description.
mfg-date	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the controller's PCBA was programmed or a power supply module was manufactured.
mfg-date-numeric	string	Unformatted mfg-date value.
mfg-location	string	City, state/province, and country where the FRU was manufactured.
mfg-vendor-id	string	JEDEC ID of the FRU manufacturer.
position	string	Fan unit position, as viewed from the back of the enclosure. • Top • Bottom • Left • Right
position-numeric	string	Numeric equivalents for position values. • 0: Top • 1: Bottom • 2: Left • 3: Right
configuration-serialnumber	string	Configuration serial number.
phy-isolation	string	Shows whether the automatic disabling of SAS expander PHYs having high error counts is enabled or disabled for this controller. • Enabled: PHY fault isolation is enabled. This is the default. • Disabled: PHY fault isolation is disabled.
phy-isolation-numeric	string	Numeric equivalents for phy-isolation values. • 0: Enabled • 1: Disabled

Table 42 io-modules properties (continued)

Name	Type	Description
status	string	I/O module status. • Up • Warning • Error • Not Present • Unknown • Disconnected
status-numeric	string	Numeric equivalents for status values. • 0: Up • 1: Warning • 2: Error • 3: Not Present • 4: Unknown • 6: Disconnected
health	string	• OK • Degraded • Fault • N/A
health-numeric	string	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 action to take to resolve the health issue.

Example

```
# show enclosures
...
   <OBJECT basetype="io-modules" name="io-module" oid="31" format="rows">
     <PROPERTY name="durable-id" type="string">iom_2.a</PROPERTY>
     <PROPERTY name="controller-id" type="string">A</PROPERTY>
     <PROPERTY name="controller-id-numeric" type="string">1</PROPERTY>
     <PROPERTY name="name" type="string"></PROPERTY>
     <PROPERTY name="description" type="string"></PROPERTY>
     <PROPERTY name="part-number" type="string"></PROPERTY>
     <PROPERTY name="serial-number" key="true" type="string"></PROPERTY>
     <PROPERTY name="revision" type="string"></PROPERTY>
     <PROPERTY name="dash-level" type="string"></PROPERTY>
     <PROPERTY name="fru-shortname" type="string"></PROPERTY>
     <PROPERTY name="mfg-date" type="string">N/A</PROPERTY>
     <PROPERTY name="mfg-date-numeric" type="string">0</PROPERTY>
     <PROPERTY name="mfg-location" type="string"></PROPERTY>
     <PROPERTY name="mfg-vendor-id" key="true" type="string"></PROPERTY>
     <PROPERTY name="position" type="string">Top</PROPERTY>
     <PROPERTY name="position-numeric" type="string">0</PROPERTY>
     <PROPERTY name="configuration-serialnumber" type="string"></PROPERTY>
     <PROPERTY name="phy-isolation" type="string">Enabled</PROPERTY>
     <PROPERTY name="phy-isolation-numeric" type="string">0</PROPERTY>
     <PROPERTY name="status" type="string">Up</PROPERTY>
     <PROPERTY name="status-numeric" type="string">0</PROPERTY>
     <PROPERTY name="health" type="string">OK</PROPERTY>
```

```
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
  </OBJECT>
...
```

Embedded basetypes

- unhealthy-component

iscsi-parameters

Properties

Table 43 iscsi-parameters properties

Name	Type	Description
chap	string	Shows whether Challenge-Handshake Authentication Protocol (CHAP) is enabled. • Enabled: CHAP is enabled. • Disabled: CHAP is disabled. This is the default.
chap-numeric	string	Numeric equivalents for chap values. • 0: Disabled • 1: Enabled
jumbo-frames	string	Shows whether support for jumbo frames is enabled. • Enabled: Jumbo-frame support is enabled. • Disabled: Jumbo-frame support is disabled. This is the default.
jumbo-frames-numeric	string	Numeric equivalents for jumbo-frames values. • 0: Disabled • 1: Enabled
isns	string	Shows whether support for Internet Storage Name Service (iSNS) is enabled. • Enabled: iSNS is enabled. • Disabled: iSNS is disabled. This is the default.
isns-numeric	string	Numeric equivalents for isns values. • 0: Disabled • 1: Enabled
isns-ip	string	Address of the iSNS server. The default address is all zeroes.
isns-alt-ip	string	Address of the alternate iSNS server. The default address is all zeroes.
iscsi-speed	string	iSCSI host port link speed. • auto: The proper speed is auto-negotiated. This is the default. • 1Gbps: The speed is forced to 1 Gbit/sec, overriding a downshift that can occur during auto-negotiation with 1-Gbit/sec HBAs. This setting does not apply to 10-Gbit/sec HBAs.
iscsi-speed-numeric	string	Numeric equivalents for iscsi-speed values. • 0: auto • 1: 1Gbps
iscsi-ip-version	uint8	iSCSI IP version. • 4: iSCSI host port addresses use IPv4 format. This is the default. • 6: iSCSI host port addresses use IPv6 format.

Example

```
# show iscsi-parameters
...
  <OBJECT basetype="iscsi-parameters" name="iscsi-parameter" oid="1" format="pairs">
    <PROPERTY name="chap" type="string">Disabled</PROPERTY>
    <PROPERTY name="chap-numeric" type="string">0</PROPERTY>
    <PROPERTY name="jumbo-frames" type="string">Enabled</PROPERTY>
    <PROPERTY name="jumbo-frames-numeric" type="string">1</PROPERTY>
    <PROPERTY name="isns" type="string">Disabled</PROPERTY>
    <PROPERTY name="isns-numeric" type="string">0</PROPERTY>
    <PROPERTY name="isns-ip" type="string">0.0.0.0</PROPERTY>
```

```
    <PROPERTY name="isns-alt-ip" type="string">0.0.0.0</PROPERTY>
    <PROPERTY name="iscsi-speed" type="string">1Gbps</PROPERTY>
    <PROPERTY name="iscsi-speed-numeric" type="string">1</PROPERTY>
    <PROPERTY name="iscsi-ip-version" type="uint8">4</PROPERTY>
  </OBJECT>
...
```

iscsi-port

Properties

Table 44 iscsi-port properties

Name	Type	Description
ip-version	string	iSCSI IP version. • IPv4: iSCSI host port addresses use IPv4 format. This is the default. • IPv6: iSCSI host port addresses use IPv6 format.
primary-ip-address	string	Primary IP address.
primary-gateway	string	Primary gateway IP address.
primary-netmask	string	Primary subnet mask IP address.
mac-address	string	Primary MAC address.
secondary-ip-address	string	Secondary IP address, displayed only during failover.
secondary-gateway	string	Secondary gateway IP address, displayed only during failover.
secondary-netmask	string	Secondary subnet mask IP address, displayed only during failover.
secondary-mac-address	string	Secondary MAC address, displayed only during failover.

Example

```
# show ports
...
    <OBJECT basetype="iscsi-port" name="port-details" oid="2" format="rows">
      <PROPERTY name="ip-version" type="string">IPv4</PROPERTY>
      <PROPERTY name="primary-ip-address" type="string">10.30.40.20</PROPERTY>
      <PROPERTY name="primary-gateway" type="string">0.0.0.0</PROPERTY>
      <PROPERTY name="primary-netmask" type="string">255.255.255.0</PROPERTY>
      <PROPERTY name="mac-address" type="string">00:C0:FF:16:38:88</PROPERTY>
      <PROPERTY name="secondary-ip-address" type="string"></PROPERTY>
      <PROPERTY name="secondary-gateway" type="string"></PROPERTY>
      <PROPERTY name="secondary-netmask" type="string"></PROPERTY>
      <PROPERTY name="secondary-mac-address" type="string"></PROPERTY>
    </OBJECT>
...
```

job-parameters

Properties

Table 45 job-parameters properties

Name	Type	Description
background-scrub	string	Shows whether disks in vdisks are automatically checked for disk defects to ensure system health. The interval between background vdisk scrub finishing and starting again is 24 hours. • Disabled: Background vdisk scrub is disabled. This is the default. • Enabled: Background vdisk scrub is enabled.
background-scrub-numeric	string	Numeric equivalents for background-scrub values. • 0: Disabled • 1: Enabled
background-scrub-pool	string	Not applicable.
background-scrub-pool-numeric	string	Not applicable.
partner-firmware-upgrade	string	Shows whether component firmware versions are monitored and will be automatically updated on the partner controller. • Disabled: Partner firmware upgrade is disabled. • Enabled: Partner firmware upgrade is enabled. This is the default.
partner-firmware-upgrade-numeric	string	Numeric equivalents for partner-firmware-upgrade values. • 0: Disabled • 1: Enabled
utility-priority	string	Priority at which data-redundancy utilities, such as vdisk verify and reconstruct, run with respect to I/O operations competing for the system's processors. (This does not affect vdisk 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.
utility-priority-numeric	string	Numeric equivalents for utility-priority values. • 0: High • 1: Medium • 2: Low

Example

```
# show job-parameters
...
  <OBJECT basetype="job-parameters" name="job-parameters" oid="1" format="pairs">
    <PROPERTY name="background-scrub" type="string">Disabled</PROPERTY>
    <PROPERTY name="background-scrub-numeric" type="string">0</PROPERTY>
    <PROPERTY name="background-scrub-pool" type="string">Disabled</PROPERTY>
    <PROPERTY name="background-scrub-pool-numeric" type="string">0</PROPERTY>
    <PROPERTY name="partner-firmware-upgrade" type="string">Disabled</PROPERTY>
    <PROPERTY name="partner-firmware-upgrade-numeric" type="string">0</PROPERTY>
    <PROPERTY name="utility-priority" type="string">High</PROPERTY>
```

```
    <PROPERTY name="utility-priority-numeric" type="string">0</PROPERTY>
  </OBJECT>
...
```

license

Properties

Table 46 license properties

Name	Type	Description
`license-key`	`string`	• *`key`*: License is installed and valid. • `not installed`: License is invalid or is not installed.
`platform-max-snapshots`	`uint32`	Maximum number of snapshots that the highest-level license allows.
`base-max-snapshots`	`uint32`	Maximum number of snapshots allowed without an installed license.
`max-snapshots`	`uint32`	Maximum number of snapshots allowed by the installed license.
`in-use-snapshots`	`uint32`	Number of existing licensed snapshots.
`max-snapshots-expiry`	`string`	License status of the Snapshot feature. • `Never`: License is purchased and doesn't expire. • *`days`*: Number of days remaining for a temporary license. • `Expired`: Temporary license has expired and cannot be renewed. • `Expired/Renewable`: Temporary license has expired and can be renewed. • `N/A`: No license installed.
`max-snapshots-expiry-numeric`	`string`	Numeric equivalents for `max-snapshots-expiry` values. • `0: Never` • `254: Expired/Renewable` • `255: Expired` • *`days`*: Number of days remaining
`volume-copy`	`string`	Shows whether the Volume Copy feature is enabled. • `Disabled`: Volume Copy is disabled. • `Enabled`: Volume Copy is enabled.
`volume-copy-numeric`	`string`	Numeric equivalents for `volume-copy` values. • `0: Disabled` • `1: Enabled`
`volume-copy-expiry`	`string`	Shows when the Volume Copy license will expire. • `Never`: License is purchased and doesn't expire. • *`days`*: Number of days remaining for a temporary license. • `Expired`: Temporary license has expired and cannot be renewed. • `Expired/Renewable`: Temporary license has expired and can be renewed. • `N/A`: No license installed.
`volume-copy-expiry-numeric`	`string`	Numeric equivalents for `volume-copy-expiry` values. • `0: Never` • `254: Expired/Renewable` • `255: Expired` • *`days`*: Number of days remaining
`remote-snapshot-replication`	`string`	Shows whether the AssuredRemote feature is enabled. • `Disabled`: AssuredRemote is disabled. • `Enabled`: AssuredRemote is enabled.

Table 46 license properties (continued)

Name	Type	Description
remote-snapshot-replication-numeric	string	Numeric equivalents for remote-snapshot-replication values. • 0: Disabled • 1: Enabled
remote-snapshot-replication-expiry	string	Shows when the AssuredRemote feature will expire. • Never: License is purchased and doesn't expire. • *days*: Number of days remaining for a temporary license. • Expired: Temporary license has expired and cannot be renewed. • Expired/Renewable: Temporary license has expired and can be renewed. • N/A: No license installed.
remote-snapshot-replication-expiry-numeric	string	Numeric equivalents for remote-snapshot-replication values. • 0: Never • 254: Expired/Renewable • 255: Expired • *days*: Number of days remaining
vds	string	Shows whether the VDS (Virtual Disk Service) Hardware Provider is enabled. • Disabled: VDS is disabled. • Enabled: VDS is enabled.
vds-numeric	string	Numeric equivalents for vds values. • 0: Disabled • 1: Enabled
vds-expiry	string	Shows when the VDS (Virtual Disk Service) Hardware Provider will expire. • Never: License is purchased and doesn't expire. • *days*: Number of days remaining for a temporary license. • Expired: Temporary license has expired and cannot be renewed. • Expired/Renewable: Temporary license has expired and can be renewed. • N/A: No license installed.
vds-expiry-numeric	string	Numeric equivalents for vds-expiry values. • 0: Never • 254: Expired/Renewable • 255: Expired • *days*: Number of days remaining.
vss	string	Shows whether the VSS (Volume Shadow Copy Service) Hardware Provider is enabled. • Disabled: VSS is disabled. • Enabled: VSS is enabled.
vss-numeric	string	Numeric equivalents for vss values. • 0: Disabled • 1: Enabled

Table 46 license properties (continued)

Name	Type	Description
vss-expiry	string	Shows when the VSS (Volume Shadow Copy Service) Hardware Provider will expire. • Never: License is purchased and doesn't expire. • *days*: Number of days remaining for a temporary license. • Expired: Temporary license has expired and cannot be renewed. • Expired/Renewable: Temporary license has expired and can be renewed. • N/A: No license installed.
vss-expiry-numeric	string	Numeric equivalents for vss-expiry values. • 0: Never • 254: Expired/Renewable • 255: Expired • *days*: Number of days remaining
dsd	string	Shows whether the Drive Spin Down (DSD) feature is enabled. • Disabled: DSD is disabled. • Enabled: DSD is enabled.
dsd-numeric	string	Numeric equivalents for dsd values. • 0: Disabled • 1: Enabled
dsd-expiry	string	Shows when the Drive Spin Down (DSD) feature will expire. • Never: and doesn't expire.
dsd-expiry-numeric	string	Numeric equivalents for dsd-expiry values. • 0: Never
sra	string	Shows whether Storage Replication Adapter (SRA) support is enabled. • Disabled: SRA is disabled. • Enabled: SRA is enabled.
sra-numeric	string	Numeric equivalents for sra values. • 0: Disabled • 1: Enabled
sra-expiry	string	Shows when the SRA feature will expire. • Never: and doesn't expire.
sra-expiry-numeric	string	Numeric equivalents for sra-expiry values. • 0: Never

Example

```
# show license
...
  <OBJECT basetype="license" name="license" oid="1">
    <PROPERTY name="license-key" key="true" type="string">key</PROPERTY>
    <PROPERTY name="platform-max-snapshots" type="uint32">1024</PROPERTY>
    <PROPERTY name="base-max-snapshots" type="uint32">0</PROPERTY>
    <PROPERTY name="max-snapshots" type="uint32">128</PROPERTY>
    <PROPERTY name="in-use-snapshots" type="uint32">0</PROPERTY>
    <PROPERTY name="max-snapshots-expiry" type="string">Never</PROPERTY>
    <PROPERTY name="max-snapshots-expiry-numeric" type="string">0</PROPERTY>
    <PROPERTY name="volume-copy" type="string">Enabled</PROPERTY>
    <PROPERTY name="volume-copy-numeric" type="string">1</PROPERTY>
    <PROPERTY name="volume-copy-expiry" type="string">Never</PROPERTY>
```

```
    <PROPERTY name="volume-copy-expiry-numeric" type="string">0</PROPERTY>
    <PROPERTY name="remote-snapshot-replication" type="string">Enabled</PROPERTY>
    <PROPERTY name="remote-snapshot-replication-numeric" type="string">1</PROPERTY>
    <PROPERTY name="remote-snapshot-replication-expiry" type="string">Never</PROPERTY>
    <PROPERTY name="remote-snapshot-replication-expiry-numeric" type="string">0
</PROPERTY>
    <PROPERTY name="vds" type="string">Enabled</PROPERTY>
    <PROPERTY name="vds-numeric" type="string">1</PROPERTY>
    <PROPERTY name="vds-expiry" type="string">Never</PROPERTY>
    <PROPERTY name="vds-expiry-numeric" type="string">0</PROPERTY>
    <PROPERTY name="vss" type="string">Enabled</PROPERTY>
    <PROPERTY name="vss-numeric" type="string">1</PROPERTY>
    <PROPERTY name="vss-expiry" type="string">Never</PROPERTY>
    <PROPERTY name="vss-expiry-numeric" type="string">0</PROPERTY>
    <PROPERTY name="dsd" type="string">Disabled</PROPERTY>
    <PROPERTY name="dsd-numeric" type="string">0</PROPERTY>
    <PROPERTY name="dsd-expiry" type="string">Never</PROPERTY>
    <PROPERTY name="dsd-expiry-numeric" type="string">0</PROPERTY>
    <PROPERTY name="sra" type="string">Enabled</PROPERTY>
    <PROPERTY name="sra-numeric" type="string">1</PROPERTY>
    <PROPERTY name="sra-expiry" type="string">Never</PROPERTY>
    <PROPERTY name="sra-expiry-numeric" type="string">0</PROPERTY>
  </OBJECT>
...
```

log-header-table

Properties

Table 47 log-header-table properties

Name	Type	Description
`log-contact`	`string`	Contact person's name, if specified in the RAIDar Save Logs panel.
`log-email`	`string`	Contact's email address, if specified in the RAIDar Save Logs panel.
`log-phone`	`string`	Contact's phone number, if specified in the RAIDar Save Logs panel.
`log-comments`	`string`	Comments describing the problem and specifying the date and time when the problem occurred, if specified in the RAIDar Save Logs panel.
`log-content`	`uint32`	For internal use only.
`log-timestamp`	`string`	Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), when log content was saved to the file.
`log-timestamp-numeric`	`string`	Unformatted `log-timestamp` value.

Example

From debug log output saved from RAIDar to a file:

```
...
  <OBJECT basetype="log-header-table" name="log-header" oid="1" format="pairs">
    <PROPERTY name="log-contact" type="string">John Smith</PROPERTY>
    <PROPERTY name="log-email" type="string">jsmith@mycompany.com</PROPERTY>
    <PROPERTY name="log-phone" type="string"></PROPERTY>
    <PROPERTY name="log-comments" type="string">Logs after controller B failure.
</PROPERTY>
    <PROPERTY name="log-content" type="uint32">8191</PROPERTY>
    <PROPERTY name="log-timestamp" type="string">2012-02-15 08:38:21</PROPERTY>
    <PROPERTY name="log-timestamp-numeric" type="string">1297413501</PROPERTY>
  </OBJECT>
...
```

master-volumes

Properties

Table 48 master-volumes properties

Name	Type	Description
virtual-disk-name	string	Vdisk name.
serial-number	string	Master volume serial number.
name	string	Master volume name.
size	string	Master volume size, formatted to use the current base, precision, and units.
size-numeric	string	Unformatted size value in 512-byte blocks.
status	string	Master volume status. • Available: The master volume is available. • Unavailable: The master volume is not available.
status-reason	string	More information about the status value. • MV Not Accessible: Master volume is not accessible. • MV Not Found: Master volume is not found. • RV: Replication volume (either a primary volume or a secondary volume). • RV Prepared: Replication-prepared volume, which could become a secondary volume in a replication set. • SP Not Accessible: Snap pool is not accessible. • SP Not Found: Snap pool is not found. • ---: The master volume is available.
snap-pool-name	string	Snap-pool name.
snapshots	string	Quantity of snapshots that exist for the master volume.
snap-data	string	Amount of snap-pool space occupied by this master volume for its associated snapshots (preserved and write data).
snap-data-numeric	string	Unformatted snap-data value in 512-byte blocks.
rollback	string	• *value*: Percent complete if a rollback is in progress. • ---: No rollback is in progress.

Example

```
# show master-volumes
...
  <OBJECT basetype="master-volumes" name="master-volume" oid="1" format="rows">
    <PROPERTY name="virtual-disk-name" type="string">v001</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="name" type="string">v001_v000</PROPERTY>
    <PROPERTY name="size" units="MB" type="string">9999.9MB</PROPERTY>
    <PROPERTY name="size-numeric" units="blocks512" type="string">19531136</PROPERTY>
    <PROPERTY name="status" type="string">Available</PROPERTY>
    <PROPERTY name="status-reason" type="string">---</PROPERTY>
    <PROPERTY name="snap-pool-name" type="string">spv001_v000</PROPERTY>
    <PROPERTY name="snapshots" type="string">0</PROPERTY>
    <PROPERTY name="snap-data" units="B" type="string">0B</PROPERTY>
    <PROPERTY name="snap-data-numeric" units="blocks512" type="string">0</PROPERTY>
    <PROPERTY name="rollback" type="string">---</PROPERTY>
  </OBJECT>
...
```

network-parameters

Properties

Table 49 network-parameters properties

Name	Type	Description
durable-id	string	Controller network port ID in the form mgmtport_*controller-ID*.
ip-address	string	Controller network port IP address.
gateway	string	Controller network port gateway IP address
subnet-mask	string	Controller network port IP subnet mask
mac-address	string	Controller network port MAC address.
addressing-mode	string	• Manual: Obtain network address from manual (static) settings. This is the default. • DHCP: Use DHCP to obtain network address.
addressing-mode-numeric	string	Numeric equivalents for addressing-mode values. • 1: Manual • 2: DHCP
link-speed	string	• Unknown: Either the link speed has not been set, or it has been unset because the controller module was removed from its enclosure. • 10mbps: The network port link speed is set to 10 Mb/s. • 100mbps: The network port link speed is set to 100 Mb/s.
link-speed-numeric	string	Numeric equivalents for link-speed values. • 0: 10mbps • 1: 100mbps • 2: Unknown
duplex-mode	string	• Undefined: Either the duplex mode has not been set, or it has been unset because the controller module was removed from its enclosure. • Half: The network port duplex mode is set to half duplex. • Full: The network port duplex mode is set to full duplex.
duplex-mode-numeric	string	Numeric equivalents for duplex-mode values. • 0: full • 1: half • 2: Undefined
auto-negotiation	string	• 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 properties. • Enabled: The network port is set to auto-negotiate a link speed (up to the maximum speed shown by the link-speed property) and duplex mode with a connected Ethernet switch.
auto-negotiation-numeric	string	Numeric equivalents for auto-negotiation values. • 0: Disabled • 1: Enabled
health	string	The health of the network connection. • OK • Degraded

Table 49 network-parameters properties (continued)

Name	Type	Description
health-numeric	string	Numeric equivalents for health values. • 0: OK • 1: Degraded
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.
ping-broadcast	string	• Enabled: The system will respond to a broadcast ping. • Disabled: The system will not respond to a broadcast ping.
ping-broadcast-numeric	string	Numeric equivalents for ping-broadcast values. • 0: Disabled • 1: Enabled

Example

```
# show network-parameters
...
  <OBJECT basetype="network-parameters" name="controller-a" oid="1" format="pairs">
    <PROPERTY name="durable-id" type="string">mgmtport_a</PROPERTY>
    <PROPERTY name="ip-address" key="true" type="string">10.136.140.102</PROPERTY>
    <PROPERTY name="gateway" type="string">10.136.0.1</PROPERTY>
    <PROPERTY name="subnet-mask" type="string">255.252.0.0</PROPERTY>
    <PROPERTY name="mac-address" type="string">value</PROPERTY>
    <PROPERTY name="addressing-mode" type="string">Manual</PROPERTY>
    <PROPERTY name="addressing-mode-numeric" type="string">1</PROPERTY>
    <PROPERTY name="link-speed" type="string">100mbps</PROPERTY>
    <PROPERTY name="link-speed-numeric" type="string">1</PROPERTY>
    <PROPERTY name="duplex-mode" type="string">full</PROPERTY>
    <PROPERTY name="duplex-mode-numeric" type="string">0</PROPERTY>
    <PROPERTY name="auto-negotiation" type="string">Enabled</PROPERTY>
    <PROPERTY name="auto-negotiation-numeric" type="string">1</PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
    <PROPERTY name="ping-broadcast" type="string">Disabled</PROPERTY>
    <PROPERTY name="ping-broadcast-numeric" type="string">0</PROPERTY>
  </OBJECT>
...
```

ntp-status

Properties

Table 50 ntp-status properties

Name	Type	Description
`ntp-status`	`string`	Shows whether use of Network Time Protocol (NTP) is enabled. • `activated`: NTP is enabled. • `deactivated`: NTP is disabled. This is the default.
`ntp-server-address`	`string`	• `0.0.0.0`: NTP server IP address is not set. • NTP server IP address.
`ntp-contact-time`	`string`	• Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), of the last message received from the NTP server. • `none`: No contact.

Example

```
# show ntp-status
...
  <OBJECT basetype="ntp-status" name="ntp-status" oid="1" format="pairs">
    <PROPERTY name="ntp-status" type="string">activated</PROPERTY>
    <PROPERTY name="ntp-server-address" type="string">10.64.10.1</PROPERTY>
    <PROPERTY name="ntp-contact-time" type="string">2012-02-15 14:52:16</PROPERTY>
  </OBJECT>
...
```

policy-threshold

Properties

Table 51 policy-threshold properties

Name	Type	Description
threshold	string	Snap pool threshold level: • Warning: The snap pool is moderately full. When this threshold is reached, an event is generated to alert the administrator. The default is 75%. • Error: The snap pool is nearly full and unless corrective action is taken, snapshot data loss is probable. When this threshold is reached, an event is generated to alert the administrator and the associated snap-pool policy is triggered. The default is 90%. • Critical: The snap pool is 98% full and data loss is imminent. When this threshold is reached, an event is generated to alert the administrator and the associated snap-pool policy is triggered.
percent-usage	string	Percent of snap pool space used that triggers the threshold's policy.

policy	string	Recovery policy to invoke when threshold value is reached:
		• autoexpand: Try to expand the snap pool by the size-to-expand value. If the snap pool's space usage reaches the percentage specified by its error threshold, the system will log Warning event 230 and will try to expand the snap pool by the snap pool's size-to-expand value (below).
		  • If the snap pool is successfully expanded, the system will log Informational event 444.
		  • If the snap pool cannot be expanded because there is not enough available space in its vdisk, the system will log Warning event 444 and will automatically delete the oldest snapshot that is not a current sync point.
		  Each time the snap-pool's error threshold is reached and the system cannot auto-expand the vdisk, the oldest remaining snapshot that is not a current sync point will be deleted. This behavior occurs for each snap pool independently, based on its space usage.
		• deleteoldestsnapshot: Delete the oldest snapshot.
		• deletesnapshots: Delete all snapshots.
		• haltwrites: Halt writes to the snap pool.
		• notifyonly: Generates an event to notify the administrator.

size-to-expand	string	• *size*: For the autoexpand policy, the size (formatted to use the current base, precision, and units) by which to expand the snap pool when the threshold is reached. • N/A: The policy is not set to autoexpand.
size-to-expand-numeric	string	Unformatted size-to-expand value in 512-byte blocks.

Example

```
# show snap-pools
...
    <OBJECT basetype="policy-threshold" name="snap-pool-policy" oid="2" format="rows">
      <PROPERTY name="threshold" type="string">Warning</PROPERTY>
      <PROPERTY name="percent-usage" type="string">75%</PROPERTY>
      <PROPERTY name="policy" type="string">Notify Only</PROPERTY>
      <PROPERTY name="size-to-expand" type="string">N/A</PROPERTY>
      <PROPERTY name="size-to-expand-numeric" units="blocks512" type="string">N/A
</PROPERTY>
    </OBJECT>
...
```

port

Properties

Table 52 port properties

Name	Type	Description
durable-id	string	Controller host port ID in the form hostport_controller-ID-and-port-number.
controller	string	• A: Controller A. • B: Controller B.
controller-numeric	string	Numeric equivalents for controller values. • 0: B • 1: A
port	string	Controller ID and port number.
port-type	string	• FC: Fibre Channel. • iSCSI: Internet SCSI. • SAS: Serial Attached SCSI.
port-type-numeric	string	Numeric equivalents for port-type values. • 6: FC • 8: SAS • 9: iSCSI
media	string	• FC(P): Fibre Channel Point-to-Point (public or private). • FC(L): Fibre Channel-Arbitrated Loop. • FC(-): Not applicable, as when the port is disconnected. • SAS: Serial Attached SCSI. • iSCSI: Internet SCSI.
target-id	string	Port WWN or IQN.
status	string	Port status. • Up • Warning • Error • Not Present • Unknown • Disconnected
status-numeric	string	Numeric equivalents for status values. • 0: Up • 1: Warning • 2: Error • 3: Not Present • 4: Unknown • 6: Disconnected

Table 52 port properties (continued)

Name	Type	Description
actual-speed	string	Actual port speed in Mbit/sec or Gbit/sec. • 10Mb • 100Mb • 1Gb • 1.5Gb • 2Gb • 3Gb • 4Gb • 6Gb • 8Gb • 10Gb • (blank): Port is disconnected.
actual-speed-numeric	string	Numeric equivalents for actual-speed values. • 0: 1Gb • 1: 2Gb • 2: 4Gb • 4: 1.5Gb • 5: 3Gb • 6: 6Gb • 7: 8Gb • 8: 10Mb • 9: 100Mb • 10: 10Gb • 255: Port is disconnected.
configured-speed	string	Configured port speed in Gbit/sec. • Auto (the default) • 1Gb • 2Gb • 4Gb • 8Gb
configured-speed-numeric	string	Numeric equivalents for configured-speed values. • 0: 1Gb • 1: 2Gb • 2: 4Gb • 3: Auto • 7: 8Gb
health	string	• OK • Degraded • Fault • N/A
health-numeric	string	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 4: N/A

Table 52 port properties (continued)

Name	Type	Description
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.

Example

```
# show ports
...
  <OBJECT basetype="port" name="ports" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">hostport_A0</PROPERTY>
    <PROPERTY name="controller" key="true" type="string">A</PROPERTY>
    <PROPERTY name="controller-numeric" key="true" type="string">1</PROPERTY>
    <PROPERTY name="port" key="true" type="string">A0</PROPERTY>
    <PROPERTY name="port-type" type="string">FC</PROPERTY>
    <PROPERTY name="port-type-numeric" type="string">6</PROPERTY>
    <PROPERTY name="media" type="string">FC(P)</PROPERTY>
    <PROPERTY name="target-id" type="string">207000c0ff143286</PROPERTY>
    <PROPERTY name="status" type="string">Up</PROPERTY>
    <PROPERTY name="status-numeric" type="string">0</PROPERTY>
    <PROPERTY name="actual-speed" type="string">4Gb</PROPERTY>
    <PROPERTY name="actual-speed-numeric" type="string">2</PROPERTY>
    <PROPERTY name="configured-speed" type="string">Auto</PROPERTY>
    <PROPERTY name="configured-speed-numeric" type="string">3</PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
    ...
  </OBJECT>
...
```

Embedded basetypes

- fc-port
- iscsi-port
- sas-port

power-supplies

Properties

Table 53 power-supplies properties

Name	Type	Description
durable-id	string	Power supply ID in the form psu_*enclosure-ID.power-supply-number*.
enclosure-id	uint32	Enclosure ID.
serial-number	string	Power supply serial number.
description	string	FRU long description.
name	string	Power supply identifier and location.
revision	string	FRU hardware revision level.
model	string	Power supply model.
vendor	string	Power supply vendor.
location	string	Power supply location in the form Enclosure *enclosure-ID - position*, where the position is as viewed from the back of the enclosure.
position	string	Power supply position, as viewed from the back of the enclosure. • Left • Right • Top • Bottom
position-numeric	string	Numeric equivalents for position values. • 0: Left • 1: Right • 2: Top • 3: Bottom
part-number	string	FRU part number.
dash-level	string	FRU template revision number.
fru-shortname	string	FRU short description.
mfg-date	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the power supply module was manufactured.
mfg-date-numeric	string	Unformatted mfg-date value.
mfg-location	string	City, state/province, and country where the FRU was manufactured.
mfg-vendor-id	string	JEDEC ID of the FRU manufacturer.
configuration-serialnumber	string	Configuration serial number.
dc12v	uint32	Voltage of the 12-volt power supply, in 100th of a volt.
dc5v	uint32	Voltage of the 5-volt power supply, in 100th of a volt.
dc33v	uint32	Voltage of the 3.3-volt power supply, in 100th of a volt.
dc12i	uint32	Voltage of the 12-volt power supply, in 100th of a volt.
dc5i	uint32	Voltage of the 5-volt power supply, in 100th of a volt.
dctemp	uint32	Power supply temperature.

Table 53 power-supplies properties (continued)

Name	Type	Description
health	string	• OK • Degraded • Fault • Unknown
health-numeric	string	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.
status	string	Power supply status. • Up • Warning • Error • Not Present • Unknown
status-numeric	string	Numeric equivalents for status values. • 0: Up • 1: Warning • 2: Error • 3: Not Present • 4: Unknown

Example

```
# show power-supplies
...
  <OBJECT basetype="power-supplies" name="power-supplies" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">psu_00</PROPERTY>
    <PROPERTY name="enclosure-id" type="uint32">0</PROPERTY>
    <PROPERTY name="serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="description" type="string">description</PROPERTY>
    <PROPERTY name="name" type="string">PSU 0, Left</PROPERTY>
    <PROPERTY name="revision" type="string">01</PROPERTY>
    <PROPERTY name="model" type="string">FRUKE01</PROPERTY>
    <PROPERTY name="vendor" type="string">0x0301</PROPERTY>
    <PROPERTY name="location" type="string">Enclosure 1 - Left</PROPERTY>
    <PROPERTY name="position" type="string">Left</PROPERTY>
    <PROPERTY name="position-numeric" type="string">0</PROPERTY>
    <PROPERTY name="part-number" type="string">FRUKE01</PROPERTY>
    <PROPERTY name="dash-level" type="string">01</PROPERTY>
    <PROPERTY name="fru-shortname" type="string">FRUKE01</PROPERTY>
    <PROPERTY name="mfg-date" type="string">2007-01-18 22:38:18</PROPERTY>
    <PROPERTY name="mfg-date-numeric" type="string">1169159898</PROPERTY>
    <PROPERTY name="mfg-location" type="string">Milpitas,CA,US</PROPERTY>
    <PROPERTY name="mfg-vendor-id" key="true" type="string">0x0301</PROPERTY>
    <PROPERTY name="configuration-serialnumber" type="string">SN</PROPERTY>
    <PROPERTY name="dc12v" type="uint32">1249</PROPERTY>
    <PROPERTY name="dc5v" type="uint32">551</PROPERTY>
    <PROPERTY name="dc33v" type="uint32">343</PROPERTY>
    <PROPERTY name="dc12i" type="uint32">0</PROPERTY>
    <PROPERTY name="dc5i" type="uint32">0</PROPERTY>
    <PROPERTY name="dctemp" type="uint32">45</PROPERTY>
```

```
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
    <PROPERTY name="status" type="string">Up</PROPERTY>
    <PROPERTY name="status-numeric" type="string">0</PROPERTY>
    ...
</OBJECT>
...
```

Embedded basetypes

- unhealthy-component
- fan

redundancy

Properties

Table 54 redundancy properties

Name	Type	Description
redundancy-mode	string	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. • Fail Over: Operation has failed over to one controller because its partner is not operational. The system has lost redundancy. • Down: Both controllers are not operational.
redundancy-mode-numeric	string	Numeric equivalents for redundancy-mode values. • 1: Independent Cache Performance Mode • 2: Active-Active ULP • 3: Single Controller • 4: Fail 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	string	Numeric equivalents for redundancy-status values. • 0: Redundant with independent cache • 1: Redundant • 3: Operational but not redundant • 4: Down • 5: Unknown
controller-a-status	string	• Operational: The controller is operational. • Down: The controller is installed but not operational. • Not Installed: The controller is not installed.
controller-a-status-numeric	string	Numeric equivalents for controller-a-status values. • 0: Operational • 1: Down • 2: Not Installed
controller-a-serial-number	string	• Controller module serial number • Not Available: The controller is down or not installed.
controller-b-status	string	• Operational: The controller is operational. • Down: The controller is installed but not operational. • Not Installed: The controller is not installed.

Table 54 redundancy properties (continued)

Name	Type	Description
controller-b-status-numeric	string	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.

Example

```
# show redundancy-mode
...
  <OBJECT basetype="redundancy" name="system-redundancy" oid="1" format="pairs">
    <PROPERTY name="redundancy-mode" type="string">Active-Active ULP</PROPERTY>
    <PROPERTY name="redundancy-mode-numeric" type="string">5951</PROPERTY>
    <PROPERTY name="redundancy-status" type="string">Redundant</PROPERTY>
    <PROPERTY name="redundancy-status-numeric" type="string">5918</PROPERTY>
    <PROPERTY name="controller-a-status" type="string">Operational</PROPERTY>
    <PROPERTY name="controller-a-status-numeric" type="string">0</PROPERTY>
    <PROPERTY name="controller-a-serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="controller-b-status" type="string">Operational</PROPERTY>
    <PROPERTY name="controller-b-status-numeric" type="string">0</PROPERTY>
    <PROPERTY name="controller-b-serial-number" type="string">SN</PROPERTY>
  </OBJECT>
...
```

refresh-counters

Properties

Table 55 refresh-counters properties

Name	Type	Description
basetype-name	(Not shown)	Shows when the data represented by the base type was last updated. • 0: The data has never been updated and is not cached. • *nonzero-number*: A timestamp indicating that the data has been updated. If the value has changed since the last time you called this command then the data has changed.

Example

This example shows output for the first three of the many basetypes:

```
# show refresh-counters
...
<OBJECT name="refresh-counters" basetype="refresh-counters">
    <PROPERTY name="drive-summary">0</PROPERTY>
    <PROPERTY name="disk-hist-statistics">0</PROPERTY>
    <PROPERTY name="virtual-disk-summary">0</PROPERTY>
    ...
</OBJECT>
...
```

remote-addresses

Properties

Table 56 remote-addresses properties

Name	Type	Description
connected-ports	string	• *port-IDs*: For a remote primary or secondary volume, the IDs of up to two hosts ports in the local system that are connected to the remote system. If two ports are connected but only one is shown, this indicates that a problem is preventing half the available bandwidth from being used. • N/A: For a local primary or secondary volume.
remote-address	string	The address of each host port in the remote system through which the volume is accessible.

Example

```
# show replication-volumes
...
    <OBJECT basetype="remote-addresses" name="remote-address" oid="2" format="rows">
      <PROPERTY name="connected-ports" type="string"></PROPERTY>
      <PROPERTY name="remote-address" type="string">IP=10.30.40.21:3260</PROPERTY>
    </OBJECT>
...
```

remote-links

Properties

Table 57 remote-links properties

Name	Type	Description
`local-host-port`	`string`	Controller host port ID in the local system, in the form `hostport_controller-ID-and-port-number`.
`type`	`string`	• `FC`: FC port. • `iSCSI`: iSCSI port.
`type-numeric`	`string`	Numeric equivalents for `type` values. • `6`: FC • `9`: iSCSI
`remote-links`	`string`	Controller host port ID of each linked port, in the form `hostport_controller-ID-and-port-number`. Multiple ports are separated by a comma.

Example

```
# verify remote-link remote-system alpha
...
  <OBJECT basetype="remote-links" name="remote-links" oid="1" format="rows">
    <PROPERTY name="local-host-port" type="string">A0</PROPERTY>
    <PROPERTY name="type" type="string">FC</PROPERTY>
    <PROPERTY name="type-numeric" type="string">6</PROPERTY>
    <PROPERTY name="remote-links" type="string"></PROPERTY>
  </OBJECT>
...

# verify links
...
  <OBJECT basetype="remote-links" name="remote-links" oid="1" format="rows">
    <PROPERTY name="local-host-port" type="string">A0</PROPERTY>
    <PROPERTY name="type" type="string">FC</PROPERTY>
    <PROPERTY name="type-numeric" type="string">6</PROPERTY>
    <PROPERTY name="remote-links" type="string">B0,B1</PROPERTY>
  </OBJECT>
...
```

remote-system

Properties

Table 58 remote-system properties

Name	Type	Description
id	string	Remote system ID.
system-name	string	• Remote system name. • Uninitialized Name: The default value.
system-contact	string	• Name of person who administers the remote system. • Uninitialized Contact: The default value.
system-location	string	• Remote system location. • Uninitialized Location: The default value.
system-information	string	• Information about the remote system. • Uninitialized Info: The default value.
vendor-name	string	Remote system vendor name.
product-id	string	Remote system product model identifier.
product-brand	string	Remote system brand name.
ip-address-a	string	• IP address of the network port in controller A in the remote system. • Not Present
ip-address-b	string	• IP address of the network port in controller B in the remote system. • Not Present
username	string	Name of a user that is configured in the remote system. This must be a manage-level user 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.
status-numeric	string	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 the local system last communicated with the remote system.
interfaces	string	• FC • iSCSI • SAS • Hybrid: FC and iSCSI.
interfaces-numeric	string	Numeric equivalents for interfaces values. • 0: FC • 1: iSCSI • 2: SAS • 3: Hybrid
isvalid-ip-a	string	• False: The IP address is not valid for controller module A in the remote system. • True: The IP address is valid for controller module A in the remote system.

Table 58 remote-system properties (continued)

Name	Type	Description
isvalid-ip-a-numeric	string	Numeric equivalents for isvalid-ip-a values. • 0: False • 1: True
isvalid-ip-b	string	• False: The IP address is not valid for controller B in the remote system. • True: The IP address is valid for controller B in the remote system.
isvalid-ip-b-numeric	string	Numeric equivalents for isvalid-ip-b values. • 0: False • 1: True

Example

```
# show remote-systems
...
  <OBJECT basetype="remote-system" name="remote-system" oid="1" format="pairs">
    <PROPERTY name="id" key="true" type="string">ARS0004b6b799422baa</PROPERTY>
    <PROPERTY name="system-name" type="string">Test1</PROPERTY>
    <PROPERTY name="system-contact" type="string">JSmith</PROPERTY>
    <PROPERTY name="system-location" type="string">Main lab</PROPERTY>
    <PROPERTY name="system-information" type="string"></PROPERTY>
    <PROPERTY name="vendor-name" type="string"></PROPERTY>
    <PROPERTY name="product-id" type="string">DH3320</PROPERTY>
    <PROPERTY name="product-brand" type="string">R/Evolution</PROPERTY>
    <PROPERTY name="ip-address-a" type="string">10.136.140.100</PROPERTY>
    <PROPERTY name="ip-address-b" type="string">Not Present</PROPERTY>
    <PROPERTY name="username" type="string">manage</PROPERTY>
    <PROPERTY name="status" type="string">Connected</PROPERTY>
    <PROPERTY name="status-numeric" type="string">2</PROPERTY>
    <PROPERTY name="last-connected" type="string">2012-02-16 10:37:55</PROPERTY>
    <PROPERTY name="interfaces" type="string">iSCSI</PROPERTY>
    <PROPERTY name="interfaces-numeric" type="string">3</PROPERTY>
    <PROPERTY name="isvalid-ip-a" type="string">True</PROPERTY>
    <PROPERTY name="isvalid-ip-a-numeric" type="string">1</PROPERTY>
    <PROPERTY name="isvalid-ip-b" type="string">False</PROPERTY>
    <PROPERTY name="isvalid-ip-b-numeric" type="string">0</PROPERTY>
  </OBJECT>
...
```

replicate-volume-tasks

Properties

Table 59 replicate-volume-tasks properties

Name	Type	Description
primary-volume-name	string	Primary volume name.
primary-volume-serial	string	Primary volume serial number.
snapshot-prefix	string	A label to identify snapshots created by this task. Snapshot names have the format prefix_s#, where # starts at 001.
replication-mode	string	• new-snapshot: Replicate a new snapshot of the volume to the remote system. This is the default. • last-snapshot: Replicate the last (most recent existing) snapshot of the volume to the remote system.
replication-mode-numeric	string	• 0: new-snapshot • 1: last-snapshot
retention-count	uint32	Number of snapshots to retain with this prefix, from 3 to 32. The default is 3.
last-created	string	Name of the last snapshot created by the task, or blank.
last-used	string	For a task whose replication mode is last-snapshot, the name of the last snapshot used for replication; or blank.

Example

```
# show tasks
...
    <OBJECT basetype="replicate-volume-tasks" name="task-replicate-volume" oid="2"
format="pairs">
      <PROPERTY name="primary-volume-name" type="string">vd02_v001</PROPERTY>
      <PROPERTY name="primary-volume-serial" type="string">SN</PROPERTY>
      <PROPERTY name="snapshot-prefix" type="string">vd02_v001_01</PROPERTY>
      <PROPERTY name="replication-mode" type="string">new-snapshot</PROPERTY>
      <PROPERTY name="replication-mode-numeric" type="string">0</PROPERTY>
      <PROPERTY name="retention-count" type="uint32">3</PROPERTY>
      <PROPERTY name="last-created" type="string"></PROPERTY>
      <PROPERTY name="last-used" type="string">N/A</PROPERTY>
    </OBJECT>
...
```

replication-image

Properties

Table 60 replication-image properties

Name	Type	Description
image-key	string	Replication image ID.
replication-volume-serial-number	string	Replication volume serial number.
image-serial-number	string	Replication image serial number.
replication-image-source	string	Name of the source replication image.
snapshot-serial	string	Replication snapshot serial number associated with the image. The replication snapshot is associated with the replication volume specified in the request.
snapshot-name	string	Replication snapshot name associated with the image. For a secondary image, this value is not filled in until the replication is completed.
creation-date-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the replication image was created.
creation-date-time-numeric	string	Unformatted creation-date-time value.

Example

```
# show replication-images
...
    <OBJECT basetype="replication-image" name="replication-image" oid="4" format="rows">
      <PROPERTY name="image-key" key="true" type="string">key</PROPERTY>
      <PROPERTY name="replication-volume-serial-number" type="string">SN</PROPERTY>
      <PROPERTY name="image-serial-number" key="true" type="string">SN</PROPERTY>
      <PROPERTY name="replication-image-source" key="true" type="string">DSVM1_S001
</PROPERTY>
      <PROPERTY name="snapshot-serial" key="true" type="string">SN</PROPERTY>
      <PROPERTY name="snapshot-name" type="string">N/A</PROPERTY>
      <PROPERTY name="creation-date-time" type="string">2012-02-16 11:02:01</PROPERTY>
      <PROPERTY name="creation-date-time-numeric" type="string">1329390121</PROPERTY>
      ...
    </OBJECT>
...
```

Embedded basetypes

- replication-image-params

replication-image-params

Properties

Table 61 replication-image-params properties

Name	Type	Description
status	string	Replication image status. • N/A: The image information is not valid. • Queued: The image is known to exist in the primary-view volume but replication has not started. • Replicating: The image is being replicated. • Suspended: The image is being replicated but replication is suspended. • Complete: The image is created, fully replicated, and available. • Create-Snapshot: The image is fully replicated but a snapshot of the image is being created. • Offline: The image has been replicated but is unusable due to an error.
status-numeric	string	Numeric equivalents for status values. • 0: N/A • 1: Queued • 2: Replicating • 3: Suspended • 4: Create-Snapshot • 5: Complete • 6: Offline
progress	string	Progress in percent if the image is being replicated. Applies only to secondary volumes.
start-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the replication operation started.
start-time-numeric	string	Unformatted start-time value.
update-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the replication operation status was last updated.
update-time-numeric	string	Unformatted update-time value.
suspended-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the replication operation was suspended.
suspended-time-numeric	string	Unformatted suspended-time value.
est-completion-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the replication operation is estimated to complete.
est-completion-time-numeric	string	Unformatted est-completion-time value.
time	string	Total time of replication, in the format *hour:minutes:seconds* (UTC), including any suspension time.

Example

```
# show replication-images
...
      <OBJECT basetype="replication-image-params" name="replication-image-params" oid="5"
format="rows">
        <PROPERTY name="status" type="string">Complete</PROPERTY>
        <PROPERTY name="status-numeric" type="string">5</PROPERTY>
        <PROPERTY name="progress" type="string">100</PROPERTY>
        <PROPERTY name="start-time" type="string">2012-02-16 11:02:01</PROPERTY>
        <PROPERTY name="start-time-numeric" type="string">1329390121</PROPERTY>
        <PROPERTY name="update-time" type="string">2012-02-16 11:05:49</PROPERTY>
        <PROPERTY name="update-time-numeric" type="string">1329390349</PROPERTY>
        <PROPERTY name="suspended-time" type="string">N/A</PROPERTY>
        <PROPERTY name="suspended-time-numeric" type="string">0</PROPERTY>
        <PROPERTY name="est-completion-time" type="string">N/A</PROPERTY>
        <PROPERTY name="est-completion-time-numeric" type="string">0</PROPERTY>
        <PROPERTY name="time" type="string">00:03:48</PROPERTY>
      </OBJECT>
...
```

replication-set

Properties

Table 62 replication-set properties

Name	Type	Description
name	string	Replication set name.
serial-number	string	Replication set serial number.

Example

```
# show replication-sets
...
  <OBJECT basetype="replication-set" name="volume" oid="1" format="labeled">
    <PROPERTY name="name" type="string">rsvd02_v001</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    ...
  </OBJECT>
...
```

Embedded basetypes

- replication-volume

replication-volume

Properties

Table 63 replication-volume properties

Name	Type	Description
`name`	`string`	Replication volume name.
`serial-number`	`string`	Replication volume serial number.
`status`	`string`	Replication volume status. • `Initializing`: The initial (full) replication to the volume is in progress. • `Online`: The volume is online and is consistent with the last replicated image. • `Inconsistent`: The volume is online but is in an inconsistent state. A full replication is required to initialize it. • `Replicating`: The volume is online and replication is in progress. • `Replicate-delay`: The volume is online but the in-progress replication has been temporarily delayed; a retry is occurring. • `Suspended`: The volume is online but the in-progress replication has been suspended. • `Offline`: The volume can be accessed but is unusable due to an error. • `Establishing proxy`: The volume is establishing a proxy connection to a remote volume. This will occur when a detached secondary volume is reattached and is re-establishing a connection with the primary system in preparation for replication. • `Detached`: The volume is detached for removal.
`status-numeric`	`string`	Numeric equivalents for `status` values. • `0: Initializing` • `1: Online` • `2: Inconsistent` • `3: Replicating` • `4: Replicate-Delay` • `5: Suspended` • `6: Offline` • `7: Establishing proxy` • `8: Detached`
`status-reason`	`string`	More information about the `status` value. • `N/A` • `Record Missing` • `Adding Volume` • `Changing Primary`
`status-reason-numeric`	`string`	Numeric equivalents for `status-reason` values. • `0: N/A` • `1: Record Missing` • `2: Adding Volume` • `4: Changing Primary`
`monitor`	`string`	Replication volume monitoring status. • `OK`: Communication to the remote volume is successfully occurring on the network. • `Failed`: Communication to the remote volume has failed because of a communication issue or because the remote volume has gone offline.

Table 63 replication-volume properties (continued)

Name	Type	Description
monitor-numeric	string	Numeric equivalents for monitor values. • 2: OK • *other*: Failed
location	string	• Local: The replication volume is in the local system. • Remote: The replication volume is in a remote system.
location-numeric	string	Numeric equivalents for location values. • 0: Local • 1: Remote
ip-address-a	string	IP address of the network port in controller A in the remote system.
ip-address-b	string	IP address of the network port in controller B in the remote system.
primary-volume-name	string	Primary volume name.
primary-volume-serial	string	Primary volume serial number.
primary-volume-status	string	Primary volume status. • Online • Conflict • Offline
primary-volume-status-numeric	string	Numeric equivalents for primary-volume-status values. • 0: Online • 1: Conflict • 2: Offline
max-queue	uint32	Maximum number of replication images to consider when determining the next image to replicate. Used only if the collision-policy property is set to Oldest. The default is 32.
max-retry-time	uint32	Maximum amount of time in seconds that the replication volume should retry a replication operation on any specific image when errors occur. Used only if the error-policy property is set to Retry. The default is 1800.
error-policy	string	Determines the action to take when an error occurs during replication. • Retry: Retry the replication for the time specified by the max-retry-time property. This is the default. • Suspend: Suspend the replication until the error is resolved automatically or through user intervention.
error-policy-numeric	string	Numeric equivalents for error-policy values. • 0: Retry • 1: Suspend
link-type	string	Type of ports used to link the primary and secondary volumes. • FC: FC ports. • iSCSI: iSCSI ports.
link-type-numeric	string	Numeric equivalents for link-type values. • 8: FC WWNN • 16: FC WWPN • 64: iSCSI IPv4 • 128: iSCSI IPv6

Table 63 replication-volume properties (continued)

Name	Type	Description
collision-policy	string	Determines the next image to replicate when multiple replication images are queued. • Newest: Only the latest replication image should be considered for the next replication operation. • Oldest: Only the latest *n* replication images should be considered for the next replication operation, where *n* is defined by the max-queue property and the oldest of these images should be considered first. This is the default.
collision-policy-numeric	string	Numeric equivalents for collision-policy values. • 0: Oldest • 1: Newest
monitor-interval	uint32	Interval in seconds at which the primary volume should query the secondary volume. The default is 300.
priority	string	Priority of the replication operation with respect to I/O operations competing for the system's processors. • High: Replication has higher priority than host I/O. This can cause heavy I/O to be slower than normal. This is the default. • Medium: Replication performance is balanced with host I/O performance. • Low: Replication runs at a slower rate with minimal effect on host I/O. Use when streaming data without interruption is more important than data redundancy.
priority-numeric	string	Numeric equivalents for priority values. • 0: High • 1: Medium • 2: Low
connection-status	string	• Not Attempted: Communication has not been attempted to the remote volume. • Online: The volumes in the replication set have a valid connection but communication is not currently active. • Active: Communication is currently active to the remote volume. • Offline: No connection is available to the remote system.
connection-status-numeric	string	Numeric equivalents for connection-status values. • 0: Not Attempted • 1: Online • 2: Active • 3: Offline
connection-time	string	Date and time of the last communication with the remote volume, or N/A.
connection-time-numeric	string	Unformatted connection-time value.
replication-set	string	Replication set serial number.
local-volume-serial-number	string	Local replication volume serial number.

Example

```
# show replication-volumes
...
    <OBJECT basetype="replication-volume" name="replication-volume" oid="2" format="rows">
      <PROPERTY name="name" type="string">vd02_v001</PROPERTY>
      <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
      <PROPERTY name="status" type="string">Online</PROPERTY>
```

```
        <PROPERTY name="status-numeric" type="string">1</PROPERTY>
        <PROPERTY name="status-reason" type="string">N/A</PROPERTY>
        <PROPERTY name="status-reason-numeric" type="string">0</PROPERTY>
        <PROPERTY name="monitor" type="string">OK</PROPERTY>
        <PROPERTY name="monitor-numeric" type="string">0</PROPERTY>
        <PROPERTY name="location" type="string">Local</PROPERTY>
        <PROPERTY name="location-numeric" type="string">0</PROPERTY>
        <PROPERTY name="ip-address-a" type="string">10.134.101.50</PROPERTY>
        <PROPERTY name="ip-address-b" type="string">10.134.101.51</PROPERTY>
        <PROPERTY name="primary-volume-name" type="string">vd02_v001</PROPERTY>
        <PROPERTY name="primary-volume-serial" type="string">SN</PROPERTY>
        <PROPERTY name="primary-volume-status" type="string">Online</PROPERTY>
        <PROPERTY name="primary-volume-status-numeric" type="string">0</PROPERTY>
        <PROPERTY name="max-queue" type="uint32">32</PROPERTY>
        <PROPERTY name="max-retry-time" type="uint32">1800</PROPERTY>
        <PROPERTY name="error-policy" type="string">Retry</PROPERTY>
        <PROPERTY name="error-policy-numeric" type="string">0</PROPERTY>
        <PROPERTY name="link-type" type="string">iSCSI</PROPERTY>
        <PROPERTY name="link-type-numeric" type="string">128</PROPERTY>
        <PROPERTY name="collision-policy" type="string">Oldest</PROPERTY>
        <PROPERTY name="collision-policy-numeric" type="string">0</PROPERTY>
        <PROPERTY name="monitor-interval" type="uint32">60</PROPERTY>
        <PROPERTY name="priority" type="string">Medium</PROPERTY>
        <PROPERTY name="priority-numeric" type="string">1</PROPERTY>
        <PROPERTY name="connection-status" type="string">Not Attempted</PROPERTY>
        <PROPERTY name="connection-status-numeric" type="string">0</PROPERTY>
        <PROPERTY name="connection-time" type="string">N/A</PROPERTY>
        <PROPERTY name="connection-time-numeric" type="string">0</PROPERTY>
        <PROPERTY name="replication-set" type="string">SN</PROPERTY>
        <PROPERTY name="local-volume-serial-number" type="string">SN</PROPERTY>
        ...
    </OBJECT>
...
```

Embedded basetypes

- remote-addresses
- replication-image

replication-volume-summary

Properties

Table 64 replication-volume-summary properties

Name	Type	Description
`name`	`string`	Replication volume name.
`serial-number`	`string`	Replication volume serial number.
`volume-type`	`string`	• `Primary Volume`: The volume is the primary volume in a replication set. • `Secondary Volume`: The volume is the secondary volume in a replication set.
`volume-type-numeric`	`string`	Numeric equivalents for `volume-type` values. • `0: Secondary Volume` • `1: Primary Volume`

Example

```
# show replication-images
...
  <OBJECT basetype="replication-volume-summary" name="replication-volume-summary" oid="1"
format="rows">
    <PROPERTY name="name" type="string">vd02_v001</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="volume-type" key="true" type="string">Primary Volume</PROPERTY>
    <PROPERTY name="volume-type-numeric" key="true" type="string">1</PROPERTY>
    ...
  </OBJECT>
...
```

Embedded basetypes

- replication-image

reset-snapshot-tasks

Properties

Table 65 reset-snapshot-tasks properties

Name	Type	Description
snapshot-name	string	Name of the snapshot to reset.
snapshot-serial	string	Serial number of the snapshot to reset.

Example

```
# show tasks
...
    <OBJECT basetype="reset-snapshot-tasks" name="task-reset-snapshot" oid="4"
format="pairs">
      <PROPERTY name="snapshot-name" type="string">vd02_v001_s001</PROPERTY>
      <PROPERTY name="snapshot-serial" type="string">SN</PROPERTY>
    </OBJECT>
...
```

sas-port

Properties

Table 66 sas-port properties

Name	Type	Description
configured-topology	string	• Direct
width	string	Number of PHY lanes in the SAS port.

Example

```
# show ports
...
    <OBJECT basetype="sas-port" name="port-details" oid="2" format="rows">
      <PROPERTY name="configured-topology" type="string">Direct</PROPERTY>
      <PROPERTY name="width" type="string">4</PROPERTY>
    </OBJECT>
...
```

sas-status-controller-a

Properties

Table 67 sas-status-controller-a properties

Name	Type	Description
enclosure-id	uint32	Enclosure ID.
controller	string	• A: Controller A. • B: Controller B.
controller-numeric	string	Numeric equivalents for controller values. • 0: B • 1: A
phy	uint32	Logical ID of the PHY within a group based on the PHY type. • Drive PHYs have IDs 0–23. • SC (Storage Controller) PHYs have IDs 0–1. • Egress, ingress, and inter-expander PHYs have IDs 0–3.
type	string	PHY type. • Undefined: The PHY doesn't exist in the expander. • Drive: 1-lane PHY that communicates between the expander and a disk drive. • Ingress: (Expansion module only) 4-lane PHY that communicates between the expander and an expansion port. • Egress: 4-lane PHY that communicates between the expander and an expansion port or SAS Out port. • Inter-Exp: (Expansion module only) Communicates between the expander and the partner's expander. • SC-0: (Controller module only) 4-lane PHY that communicates between the expander and the SC. • SC-1: (Controller module only) 2-lane PHY that communicates between the expander and the partner's expander. • Unused: The PHY exists in the expander but is not connected, by design.
type-numeric	string	Numeric equivalents for type values. • 0: Undefined • 1: Drive • 2: Ingress • 3: Egress • 4: Inter-Exp • 6: Unused • 50: SC-0 • 51: SC-1
status	string	PHY status. • Unavailable: No status information is available. • Enabled - Healthy: The PHY is enabled and healthy. • Enabled - Degraded: The PHY is enabled but degraded. • Disabled: The PHY has been disabled by a user or by the system.
status-numeric	string	Numeric equivalents for status values. • 0: Unavailable • 1: Enabled - Healthy • 2: Enabled - Degraded • 3: Disabled

Table 67 sas-status-controller-a properties (continued)

Name	Type	Description

elem-status	string	The SES status that corresponds to the PHY status.
		• Disabled: Critical condition is detected.
		• Error: Unrecoverable condition is detected. Appears only if there is a firmware problem related to PHY definition data.
		• 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.

elem-status-numeric	string	Numeric equivalents for elem-status values. • 0: Error • 1: OK • 2: Disabled • 3: Non-critical • 4: Error • 5: Not Used • 6: Unknown • 7: Unknown • 8: Unknown
elem-disabled	string	• Enabled: PHY is enabled. • Disabled: PHY is disabled.
elem-disabled-numeric	string	Numeric equivalents for elem-disabled values. • 0: Enabled • 1: Disabled
elem-reason	string	More information about the status value. • Blank if elem-status is OK. • Error count interrupts: PHY disabled because of error-count interrupts. • Externally disabled: PHY disabled externally via serial debug port. • 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. • 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.

Table 67 sas-status-controller-a properties (continued)

Name	Type	Description
elem-reason-numeric	string	Numeric equivalents for elem-reason values. • 0: (blank) • 32769: Error count interrupts • 32770: Externally disabled • 32771: PHY control • 32772: Not ready • 32774: Drive removed • 32775: Unused - disabled by default • 32776: Excessive PHY changes
change-counter	uint32	Number of times the PHY originated a BROADCAST (CHANGE). A BROADCAST (CHANGE) is sent if doubleword synchronization is lost or at the end of a Link Reset sequence.
code-violations	uint32	Number of times the PHY received an unrecognized or unexpected signal.
disparity-errors	uint32	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.
crc-errors	uint32	In a sequence of SAS transfers (frames), the data is protected by a cyclic redundancy check (CRC) value. The crc-errors value specifies the number of times the computed CRC does not match the CRC stored in the frame, which indicates that the frame might have been corrupted in transit.
conn-crc-errors	uint32	Number of times the lane between two expanders experienced a communication error.
lost-dwords	uint32	Number of times the PHY has lost doubleword synchronization and restarted the Link Reset sequence.
invalid-dwords	uint32	Number of invalid doublewords that have been received by the PHY, not including those received during Link Reset sequences.
reset-error-counter	uint32	Number of times the expander performed a reset of error counters.
flag-bits	uint32	PHY status flag bits.

Example

```
# show expander-status
...
  <OBJECT basetype="sas-status-controller-a" name="enclosure-id" oid="1" format="rows">
    <PROPERTY name="enclosure-id" type="uint32">0</PROPERTY>
    <PROPERTY name="controller" type="string">A</PROPERTY>
    <PROPERTY name="controller-numeric" type="string">1</PROPERTY>
    <PROPERTY name="phy" type="uint32">0</PROPERTY>
    <PROPERTY name="type" type="string">Drive</PROPERTY>
    <PROPERTY name="type-numeric" type="string">1</PROPERTY>
    <PROPERTY name="status" type="string">Enabled - Healthy</PROPERTY>
    <PROPERTY name="status-numeric" type="string">1</PROPERTY>
    <PROPERTY name="elem-status" type="string">OK</PROPERTY>
    <PROPERTY name="elem-status-numeric" type="string">1</PROPERTY>
    <PROPERTY name="elem-disabled" type="string">Enabled</PROPERTY>
    <PROPERTY name="elem-disabled-numeric" type="string">0</PROPERTY>
    <PROPERTY name="elem-reason" type="string"></PROPERTY>
    <PROPERTY name="elem-reason-numeric" type="string">0</PROPERTY>
    <PROPERTY name="change-counter" type="uint32">00000003</PROPERTY>
    <PROPERTY name="code-violations" type="uint32">00000000</PROPERTY>
    <PROPERTY name="disparity-errors" type="uint32">00000000</PROPERTY>
    <PROPERTY name="crc-errors" type="uint32">00000000</PROPERTY>
```

```
    <PROPERTY name="conn-crc-errors" type="uint32">00000000</PROPERTY>
    <PROPERTY name="lost-dwords" type="uint32">00000000</PROPERTY>
    <PROPERTY name="invalid-dwords" type="uint32">00000000</PROPERTY>
    <PROPERTY name="reset-error-counter" type="uint32">00000000</PROPERTY>
    <PROPERTY name="flag-bits" type="uint32">4001a025</PROPERTY>
  </OBJECT>
...
```

schedules

Properties

Table 68 schedules properties

Name	Type	Description
name	string	Schedule name.
schedule-specification	string	Schedule settings for running the associated task.
status	string	Schedule status. • Uninitialized: The schedule is not yet ready to run. • Ready: The schedule is ready to run at the next scheduled time. • Suspended: The schedule had an error and is holding in its current state. • Expired: The schedule has exceeded a constraint and will not run again. • Invalid: The schedule is invalid.
next-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the schedule will next run.
next-time-numeric	string	Unformatted next-time value.
task-to-run	string	Name of the task that the schedule runs.
error-message	string	Error message, or blank.

Example

```
# show schedules
...
  <OBJECT basetype="schedules" name="schedule" oid="3" format="pairs">
    <PROPERTY name="name" key="true" type="string">vd02_v001_sched1</PROPERTY>
    <PROPERTY name="schedule-specification" type="string">Start 2012-02-16 12:00:00
</PROPERTY>
    <PROPERTY name="status" type="string">Ready</PROPERTY>
    <PROPERTY name="next-time" type="string">2012-02-16 12:00:00</PROPERTY>
    <PROPERTY name="next-time-numeric" type="string">1261016000</PROPERTY>
    <PROPERTY name="task-to-run" type="string">vd02_v001_task001</PROPERTY>
    <PROPERTY name="error-message" type="string"></PROPERTY>
    ...
  </OBJECT>
...
```

See also

- tasks

security-communications-protocols

Properties

Table 69 security-communications-protocols properties

Name	Type	Description
wbi-http	string	• Disabled: The standard RAIDar web server is disabled. • Enabled: The standard RAIDar web server is enabled. This is the default.
wbi-http-numeric	string	Numeric equivalents for wbi-http values. • 0: Disabled • 1: Enabled
wbi-https	string	• Disabled: The secure RAIDar web server is disabled. • Enabled: The secure RAIDar web server is enabled. This is the default.
wbi-https-numeric	string	Numeric equivalents for wbi-https values. • 0: Disabled • 1: Enabled
cli-telnet	string	• Disabled: The standard CLI is disabled. • Enabled: The standard CLI is enabled. This is the default.
cli-telnet-numeric	string	Numeric equivalents for cli-telnet values. • 0: Disabled • 1: Enabled
cli-ssh	string	• Disabled: The secure shell CLI is disabled. • Enabled: The secure shell CLI is enabled. This is the default.
cli-ssh-numeric	string	Numeric equivalents for cli-ssh values. • 0: Disabled • 1: Enabled
smis	string	• Disabled: The secure SMI-S interface is disabled. • Enabled: The secure SMI-S interface is enabled. This is the default.
smis-numeric	string	Numeric equivalents for smis values. • 0: Disabled • 1: Enabled
usmis	string	• Disabled: The unsecure SMI-S interface is disabled. This is the default. • Enabled: The unsecure SMI-S interface is enabled.
usmis-numeric	string	Numeric equivalents for smis values. • 0: Disabled • 1: Enabled
ftp	string	• Disabled: The FTP interface is disabled. • Enabled: The FTP interface is enabled. This is the default.
ftp-numeric	string	Numeric equivalents for ftp values. • 0: Disabled • 1: Enabled
snmp	string	• Disabled: The SNMP interface is disabled. • Enabled: The SNMP interface is enabled. This is the default.
snmp-numeric	string	Numeric equivalents for snmp values. • 0: Disabled • 1: Enabled

Table 69 security-communications-protocols properties (continued)

Name	Type	Description
debug-interface	string	• Disabled: The Telnet debug port is disabled. This is the default. • Enabled: The Telnet debug port is enabled.
debug-interface-numeric	string	Numeric equivalents for debug-interface values. • 0: Disabled • 1: Enabled
inband-ses	string	• Disabled: The in-band SES interface is disabled. • Enabled: The in-band SES interface is enabled. This is the default.
inband-ses-numeric	string	Numeric equivalents for inband-ses values. • 0: Disabled • 1: Enabled

Example

```
# show protocols
...
  <OBJECT basetype="security-communications-protocols" name="services-security-protocols"
oid="1" format="pairs">
    <PROPERTY name="wbi-http" type="string">Enabled</PROPERTY>
    <PROPERTY name="wbi-http-numeric" type="string">1</PROPERTY>
    <PROPERTY name="wbi-https" type="string">Enabled</PROPERTY>
    <PROPERTY name="wbi-https-numeric" type="string">1</PROPERTY>
    <PROPERTY name="cli-telnet" type="string">Enabled</PROPERTY>
    <PROPERTY name="cli-telnet-numeric" type="string">1</PROPERTY>
    <PROPERTY name="cli-ssh" type="string">Enabled</PROPERTY>
    <PROPERTY name="cli-ssh-numeric" type="string">1</PROPERTY>
    <PROPERTY name="smis" type="string">Enabled</PROPERTY>
    <PROPERTY name="smis-numeric" type="string">1</PROPERTY>
    <PROPERTY name="usmis" type="string">Disabled</PROPERTY>
    <PROPERTY name="usmis-numeric" type="string">0</PROPERTY>
    <PROPERTY name="ftp" type="string">Enabled</PROPERTY>
    <PROPERTY name="ftp-numeric" type="string">1</PROPERTY>
    <PROPERTY name="snmp" type="string">Enabled</PROPERTY>
    <PROPERTY name="snmp-numeric" type="string">1</PROPERTY>
    <PROPERTY name="debug-interface" type="string">Enabled</PROPERTY>
    <PROPERTY name="debug-interface-numeric" type="string">1</PROPERTY>
    <PROPERTY name="inband-ses" type="string">Enabled</PROPERTY>
    <PROPERTY name="inband-ses-numeric" type="string">1</PROPERTY>
  </OBJECT>
...
```

sensors

Properties

Table 70 sensors properties

Name	Type	Description
durable-id	string	Sensor ID. For example: temp_*controller-ID.sensor-number*; voltage_*controller-ID.sensor-number*, current_*enclosure-ID.sensor-number*.
enclosure-id	uint32	Enclosure ID.
sensor-name	string	Sensor name and location.
value	string	• For a sensor, its value. • For overall unit status, one of the status values below.
status	string	• OK: The sensor is present and detects no error condition. • Warning: The sensor detected a non-critical error condition. Temperature, voltage, or current is between the warning and critical thresholds. • Error: The sensor detected a critical error condition. Temperature, voltage, or current exceeds the critical threshold. • Unavailable: The sensor is present with no known errors, but has not been turned on or set into operation because it is initializing. This typically occurs during controller startup. • Unrecoverable: The enclosure management processor (EMP) cannot communicate with the sensor. • Unknown: The sensor is present but status is not available. • Not Installed: The sensor is not present. • Unsupported: Status detection is not implemented.
status-numeric	string	Numeric equivalents for status values. • 0: Unsupported • 1: OK • 2: Error • 3: Warning • 4: Unrecoverable • 5: Not Installed • 6: Unknown • 7: Unavailable
sensor-location	uint32	Sensor location in a controller enclosure. • 1: Unknown • 2: Overall unit status • 5: Power supply unit • 7: Enclosure • 8: On board
sensor-type	uint32	• 2: Overall unit status • 3: Temperature • 6: Capacitor charge • 9: Voltage

Example

```
# show sensor-status
...
  <OBJECT basetype="sensors" name="sensor" oid="1" format="rows">
    <PROPERTY name="durable-id" type="string">temp_a.0</PROPERTY>
    <PROPERTY name="enclosure-id" type="uint32">0</PROPERTY>
    <PROPERTY name="sensor-name" key="true" type="string">On-Board Temperature 1-Ctlr A
</PROPERTY>
    <PROPERTY name="value" type="string">45 C</PROPERTY>
    <PROPERTY name="status" type="string">OK</PROPERTY>
    <PROPERTY name="status-numeric" type="uint32">3</PROPERTY>
    <PROPERTY name="sensor-location" type="uint32">8</PROPERTY>
    <PROPERTY name="sensor-type" type="uint32">3</PROPERTY>
  </OBJECT>
...
```

ses

Properties

Table 71 ses properties

Name	Type	Description
id	string	SCSI ID of the enclosure.
chassis	string	Chassis serial number.
vendor	string	Enclosure vendor name.
product-id	string	Product model identifier.
cpld-revision	string	Complex Programmable Logic Device version.
emp-a-busid	string	SCSI channel ID of controller A's EMP.
emp-a-targetid	string	SCSI target ID of controller A's EMP.
emp-a-rev	string	Firmware revision of controller A's EMP.
emp-a	string	Shows the field name EMP A in console format.
emp-a-ch-id-rev	string	SCSI address and firmware revision of controller A's EMP.
emp-b-busid	string	SCSI channel ID of controller B's EMP
emp-b-targetid	string	SCSI target ID of controller B's EMP.
emp-b-rev	string	Firmware revision of controller B's EMP.
emp-b	string	Shows the field name EMP B in console format.
emp-b-ch-id-rev	string	SCSI address and firmware revision of controller B's EMP.
wwpn	string	World wide port name of the SES device reporting the enclosure status.
topology	string	Type of topology for the disk channels. • N/A
status	string	Overall status of the enclosure. • Absent: The enclosure is not present. • Error: The enclosure has a fault. • OK: The enclosure is operating normally. • Not Available: Status is not available.

Example

```
# show enclosure-status
...
  <OBJECT basetype="ses" name="enclosure-environmental" oid="1" format="rows">
    <PROPERTY name="id" type="string">031</PROPERTY>
    <PROPERTY name="chassis" type="string">SN</PROPERTY>
    <PROPERTY name="vendor" type="string">DotHill</PROPERTY>
    <PROPERTY name="product-id" type="string">R/Evo 3000</PROPERTY>
    <PROPERTY name="cpld-revision" type="string">23</PROPERTY>
    <PROPERTY name="emp-a-busid" type="string">00</PROPERTY>
    <PROPERTY name="emp-a-targetid" type="string">031</PROPERTY>
    <PROPERTY name="emp-a-rev" type="string">2018</PROPERTY>
    <PROPERTY name="emp-a" type="string"></PROPERTY>
    <PROPERTY name="emp-a-ch-id-rev" type="string">00:031 2018</PROPERTY>
    <PROPERTY name="emp-b-busid" type="string">01</PROPERTY>
    <PROPERTY name="emp-b-targetid" type="string">031</PROPERTY>
    <PROPERTY name="emp-b-rev" type="string">2018</PROPERTY>
    <PROPERTY name="emp-b" type="string"></PROPERTY>
    <PROPERTY name="emp-b-ch-id-rev" type="string">01:031 2018</PROPERTY>
    <PROPERTY name="wwpn" type="string">500c0ff01432863c</PROPERTY>
    <PROPERTY name="topology" type="string">N/A</PROPERTY>
```

```
    <PROPERTY name="status" type="string">OK</PROPERTY>
  </OBJECT>
...
```

shutdown-status

Properties

Table 72 shutdown-status properties

Name	Type	Description
`controller`	`string`	• `A`: Controller A. • `B`: Controller B.
`status`	`string`	• `up`: The controller is operational. • `down`: The controller is shut down.

Example

```
# show shutdown-status
...
  <OBJECT basetype="shutdown-status" name="controller" oid="1" format="packed">
    <PROPERTY name="controller" type="string">A</PROPERTY>
    <PROPERTY name="status" type="string">up</PROPERTY>
  </OBJECT>
...
```

snap-pools

Properties

Table 73 snap-pools properties

Name	Type	Description
virtual-disk-name	string	Vdisk name.
serial-number	string	Snap pool serial number.
name	string	Snap pool name.
size	string	Snap pool size, formatted to use the current base, precision, and units.
size-numeric	string	Unformatted size value in 512-byte blocks.
free	string	Amount of free space in this snap pool, formatted to use the current base, precision, and units.
free-numeric	string	Unformatted free value in 512-byte blocks.
master-volumes	string	Number of master volumes associated with this snap pool.
snapshots	string	Number of snapshots using this snap pool.
status	string	• Available: The snap pool is available for use. • Offline: The snap pool is not available for use, as in the case where its disks are not present. • Corrupt: The snap pool's data integrity has been compromised; the snap pool can no longer be used.
status-numeric	string	Numeric equivalents for status values. • 0: Available • Bitmask with second significant digit set: Offline • Bitmask with third significant digit set: Corrupt

Example

```
# show snap-pools
...
  <OBJECT basetype="snap-pools" name="snap-pool" oid="5" format="rows">
    <PROPERTY name="virtual-disk-name" type="string">vd02</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="name" type="string">spvd02_v001</PROPERTY>
    <PROPERTY name="size" units="MB" type="string">5368.7MB</PROPERTY>
    <PROPERTY name="size-numeric" units="blocks512" type="string">10485760</PROPERTY>
    <PROPERTY name="free" units="MB" type="string">5358.2MB</PROPERTY>
    <PROPERTY name="free-numeric" units="blocks512" type="string">10465280</PROPERTY>
    <PROPERTY name="master-volumes" type="string">1</PROPERTY>
    <PROPERTY name="snapshots" type="string">1</PROPERTY>
    <PROPERTY name="status" type="string">Available</PROPERTY>
    <PROPERTY name="status-numeric" type="string">0</PROPERTY>
    ...
</OBJECT>
...
```

Embedded basetypes

- policy-threshold

snapshots

Properties

Table 74 snapshots properties

Name	Type	Description
virtual-disk-name	string	Vdisk name.
serial-number	string	Snapshot serial number.
name	string	Snapshot name.
creation-date-time	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the snapshot was prepared or committed.
creation-date-time-numeric	string	Unformatted creation-date-time value.
status	string	Snapshot status. • Available • Unavailable: See the status-reason value.
status-numeric	string	• 0: Available • Nonzero: Unavailable
status-reason	string	Shows N/A for Available status, or one of the following reasons for Unavailable status: • Snapshot not found. • Snap pool not found. • Master volume not found. • Snapshot pending (not yet committed). • Snap pool not accessible • Master volume not accessible. • Volume copy with modified data is in progress. • Rollback with modified data is in progress.
status-reason-numeric	string	Numeric equivalents for status-reason values. • 1: Snapshot pending (not yet committed). • 3: Snap pool not accessible. • 4: Master volume not accessible. • 6: Rollback with modified data is in progress. • 7: Volume copy with modified data is in progress. • 8: Snapshot not found. • 9: Snap pool not found. • 10: Master volume not found. • 256: N/A.
master-volume-name	string	Source volume name.
snap-pool-name	string	Snap pool name.
snap-data	string	Total amount of preserved and write data associated with the snapshot.
snap-data-numeric	string	Unformatted snap-data value in 512-byte blocks.
uniquedata	string	Amount of preserved and write data that is unique to the snapshot.
uniquedata-numeric	string	Unformatted uniquedata value in 512-byte blocks.

Table 74 snapshots properties (continued)

Name	Type	Description
shareddata	string	Amount of preserved and write data that is shared between this snapshot and other snapshots.
shareddata-numeric	string	Unformatted shareddata value in 512-byte blocks.
priority-value	string	Retention priority for the snapshot, based on the snapshot attributes and the user-defined retention priority for the snapshot type. • 0x2000: Queued snapshot. The snapshot was taken for remote replication but is queued, waiting for a previous replication to complete. • 0x4000: Replication snapshot. • 0x6000: Standard snapshot. • 0x8000: Common sync point. The latest snapshot that is copy-complete on all secondary volumes. • 0xa000: Volume-copy snapshot. Snapshot that is being used to copy data from a source volume to a destination volume. • 0xc000: Replicating snapshot. Snapshot that is being replicated from a primary system to a secondary system. • 0xe000: Only sync point. The snapshot is the only sync point that is available on any secondary volume.
user_priority-value	string	User-defined retention priority for the snapshot type.
snapshot-type	string	Snapshot type. • Standard snapshot: Snapshot of a master volume that consumes a snapshot license. • Standard snapshot(DRM): A temporary standard snapshot created from a replication snapshot for the purpose of doing a test failover for disaster recovery management (DRM). • Replication snapshot: For a primary or secondary volume, a snapshot that was created by a replication operation but is not a sync point. • Replication snapshot(Replicating): For a primary volume, a snapshot that is being replicated to a secondary system. • Replication snapshot(Current sync point): For a primary or secondary volume, the latest snapshot that is copy-complete on any secondary system in the replication set. • Replication snapshot(Common sync point): For a primary or secondary volume, the latest snapshot that is copy-complete on all secondary systems in the replication set. • Replication snapshot(Old Common sync point): For a primary or secondary volume, a common sync point that has been superseded by a new common sync point. • Replication snapshot(Only sync point): For a primary or secondary volume, the only snapshot that is copy-complete on any secondary system in the replication set. • Replication snapshot(Queued): For a primary volume, a snapshot associated with a replication operation that is waiting for a previous replication operation to complete. • Replication snapshot(Awaiting replicate): For a primary volume, a snapshot that is waiting to be replicated to a secondary system.

Table 74 snapshots properties (continued)

Name	Type	Description
snapshot-type-numeric	string	Numeric equivalents for snapshot-type values. • 0x00004000: Standard snapshot • 0x0000b000: Standard snapshot(DRM) • 0x00008000: Replication snapshot • 0x00010000: Replication snapshot(Replicating) • 0x00020000: Replication snapshot(Current sync point) • 0x00040000: Replication snapshot(Common sync point) • 0x00080000: Replication snapshot(Only sync point) • 0x00100000: Replication snapshot(Queued) • 0x00200000: Replication snapshot(Awaiting replicate) • 0x00800000: Replication snapshot(Common sync point) • 0x00000000: N/A

Example

```
# show snapshots
...
  <OBJECT basetype="snapshots" name="snapshot" oid="1" format="rows">
    <PROPERTY name="virtual-disk-name" type="string">vd02</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="name" type="string">vd02_v001_s001</PROPERTY>
    <PROPERTY name="creation-date-time" type="string">2012-02-16 12:19:57</PROPERTY>
    <PROPERTY name="creation-date-time-numeric" type="string">1329394797</PROPERTY>
    <PROPERTY name="status" type="string">Available</PROPERTY>
    <PROPERTY name="status-numeric" type="string">16384</PROPERTY>
    <PROPERTY name="status-reason" type="string">N/A</PROPERTY>
    <PROPERTY name="status-reason-numeric" type="string">254</PROPERTY>
    <PROPERTY name="master-volume-name" type="string">vd02_v001</PROPERTY>
    <PROPERTY name="snap-pool-name" type="string">spvd02_v001</PROPERTY>
    <PROPERTY name="snap-data" units="B" type="string">0B</PROPERTY>
    <PROPERTY name="snap-data-numeric" units="blocks512" type="string">0</PROPERTY>
    <PROPERTY name="uniquedata" units="B" type="string">0B</PROPERTY>
    <PROPERTY name="uniquedata-numeric" units="blocks512" type="string">0</PROPERTY>
    <PROPERTY name="shareddata" units="B" type="string">0B</PROPERTY>
    <PROPERTY name="shareddata-numeric" units="blocks512" type="string">0</PROPERTY>
    <PROPERTY name="priority-value" type="string">0x6000</PROPERTY>
    <PROPERTY name="user_priority-value" type="string">0x0000</PROPERTY>
    <PROPERTY name="snapshot-type" type="string">Standard snapshot</PROPERTY>
    <PROPERTY name="snapshot-type-numeric" type="string">16384</PROPERTY>
  </OBJECT>
...
```

snapshot-with-retention-tasks

Properties

Table 75 snapshot-with-retention-tasks properties

Name	Type	Description
master-volume-name	string	Source volume name.
master-volume-serial	string	Source volume serial number.
snapshot-prefix	string	A label to identify snapshots created by this task. Snapshot names have the format prefix_s#, where # starts at 001.
retention-count	uint32	Number of snapshots to retain with this prefix, from 1 to 32. When a new snapshot exceeds this limit, the oldest snapshot with the same prefix is deleted.
last-created	string	Name of the last snapshot created by the task, or blank.

Example

```
# show tasks
...
    <OBJECT basetype="snapshot-with-retention-tasks" name="task-snapshow-with-retention"
oid="6" format="pairs">
      <PROPERTY name="master-volume-name" type="string">vd02_v001</PROPERTY>
      <PROPERTY name="master-volume-serial" type="string">SN</PROPERTY>
      <PROPERTY name="snapshot-prefix" type="string">SnapSet001</PROPERTY>
      <PROPERTY name="retention-count" type="uint32">1</PROPERTY>
      <PROPERTY name="last-created" type="string"></PROPERTY>
    </OBJECT>
...
```

snap-tasks

Properties

Table 76 snap-tasks properties

Name	Type	Description
snapshot-name	string	Snapshot name.
snapshot-serial	string	Snapshot serial number.

Example

```
# show tasks
...
      <OBJECT basetype="snap-tasks" name="snapshots" oid="3" format="rows">
      <PROPERTY name="snapshot-name" key="true" type="string">v1_R0003</PROPERTY>
      <PROPERTY name="snapshot-serial" type="string">SN</PROPERTY>
</OBJECT>
...
```

snmp-parameters

Properties

Table 77 snmp-parameters properties

Name	Type	Description
snmp-enabled	string	Shows whether the Simple Network Management Protocol (SNMP) interface is enabled or disabled. • Disabled: SNMP is disabled. This is the default. • Enabled: SNMP is enabled.
snmp-enabled-numeric	string	Numeric equivalents for snmp-enabled values. • 0: Disabled • 1: Enabled
snmp-filter	string	Minimum level of events to include for SNMP traps. • crit: Only critical events are sent as traps. • error: Error and critical events are sent as traps. • warn: Warning, error, and critical events are sent as traps. • info: All events are sent as traps. • none: No events are sent as traps and traps are disabled. This is the default.
snmp-filter-numeric	string	Numeric equivalents for snmp-filter values. • 0: none • 1: info • 2: error • 4: warn • 8: crit
snmp-trap-host-1	string	Trap host IP address.
snmp-trap-host-2	string	Trap host IP address.
snmp-trap-host-3	string	Trap host IP address.
snmp-read-community	string	Community string for SNMP read-only access (not shown to Monitor users). The default is public.
snmp-write-community	string	Community string for SNMP write access (not shown to Monitor users). The default is private.

Example

```
# show snmp-parameters
...
  <OBJECT basetype="snmp-parameters" name="snmp-parameters" oid="1">
    <PROPERTY name="snmp-enabled" type="string">Enabled</PROPERTY>
    <PROPERTY name="snmp-enabled-numeric" type="string">1</PROPERTY>
    <PROPERTY name="snmp-filter" type="string">error</PROPERTY>
    <PROPERTY name="snmp-filter-numeric" type="string">12</PROPERTY>
    <PROPERTY name="snmp-trap-host-1" type="string">10.128.38.188</PROPERTY>
    <PROPERTY name="snmp-trap-host-2" type="string">0.0.0.0</PROPERTY>
    <PROPERTY name="snmp-trap-host-3" type="string">0.0.0.0</PROPERTY>
    <PROPERTY name="snmp-read-community" type="string">public</PROPERTY>
    <PROPERTY name="snmp-write-community" type="string">private</PROPERTY>
  </OBJECT>
...
```

status

Properties

Table 78 status properties

Name	Type	Description
response-type	string	• Success: The command succeeded. • Error: The command failed. • Info: The command returned an informational message.
response-type-numeric	string	• 0: Success • 1: Error • 2: Info
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	string	Unformatted time-stamp value.

Example

```
# any-command
...
  <OBJECT basetype="status" name="status" oid="2">
    <PROPERTY name="response-type" type="string">Success</PROPERTY>
    <PROPERTY name="response-type-numeric" type="string">0</PROPERTY>
    <PROPERTY name="response" type="string">Command completed successfully.
(2012-02-16 13:46:41)</PROPERTY>
    <PROPERTY name="return-code" type="sint32">0</PROPERTY>
    <PROPERTY name="component-id" type="string"></PROPERTY>
    <PROPERTY name="time-stamp" type="string">2012-02-16 13:46:41</PROPERTY>
    <PROPERTY name="time-stamp-numeric" type="string">1329400001</PROPERTY>
  </OBJECT>
...
```

system

Properties

Table 79 system properties

Name	Type	Description
system-name	string	Storage system name. The default is Uninitialized Name.
system-contact	string	The name of person who administers the system. The default is Uninitialized Contact.
system-location	string	The location of the system. The default is Uninitialized Location.
system-information	string	A brief description of what the system is used for or how it's configured. The default is Uninitialized Info.
midplane-serial-number	string	The serial number of the controller enclosure midplane.
vendor-name	string	Vendor name.
product-id	string	Product model identifier.
product-brand	string	Product brand name.
scsi-vendor-id	string	Vendor name returned by the SCSI INQUIRY command.
scsi-product-id	string	Product identifier returned by the SCSI INQUIRY command.
enclosure-count	uint32	Number of enclosures in the storage system.
health	string	• OK • Degraded • Fault • Unknown
health-numeric	string	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown
health-reason	string	If Health is not OK, the reason for the health state.
supported-locales	string	Supported display languages: English, Spanish, French, German, Italian, Japanese, Dutch, Chinese-Simplified, Chinese-Traditional, Korean.
current-node-wwn	string	Storage system node World Wide Name (WWNN).

Example

```
# show system
...
  <OBJECT basetype="system" name="system-information" oid="1" format="pairs">
    <PROPERTY name="system-name" type="string">Test1</PROPERTY>
    <PROPERTY name="system-contact" type="string">JSmith</PROPERTY>
    <PROPERTY name="system-location" type="string">Main lab</PROPERTY>
    <PROPERTY name="system-information" type="string"></PROPERTY>
    <PROPERTY name="midplane-serial-number" type="string">SN</PROPERTY>
    <PROPERTY name="vendor-name" type="string"></PROPERTY>
    <PROPERTY name="product-id" type="string">DH3920</PROPERTY>
    <PROPERTY name="product-brand" type="string">R/Evolution</PROPERTY>
    <PROPERTY name="scsi-vendor-id" type="string">DotHill</PROPERTY>
    <PROPERTY name="scsi-product-id" type="string">DH3000</PROPERTY>
    <PROPERTY name="enclosure-count" type="uint32">6</PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
```

```
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="supported-locales" type="string">locales</PROPERTY>
    <PROPERTY name="current-node-wwn" type="string">208000c0ff143286</PROPERTY>
    ...
</OBJECT>
...
```

Embedded basetypes

- redundancy
- unhealthy-component

system-parameters-table

Properties

Table 80 system-parameters-table properties

Name	Type	Description
ulp-enabled	string	Shows true to indicate that the system is using Unified LUN Presentation, which can expose all LUNs through all host ports on both controllers. The interconnect information is managed in the controller firmware. ULP appears to the host as an active-active storage system where the host can choose any available path to access a LUN regardless of vdisk ownership. When ULP is in use, the system's operating/cache-redundancy mode is shown as Active-Active ULP. ULP uses the T10 Technical Committee of INCITS Asymmetric Logical Unit Access (ALUA) extensions, in SPC-3, to negotiate paths with aware host systems. Unaware host systems see all paths as being equal.
profiles-enabled	string	Shows whether host profiles are enabled, which determines whether LUN 0 can be assigned to volume mappings. • false: Host profiles are disabled.
max-ports	uint32	Number of host-interface ports in the controller enclosure.
max-drives	uint32	Number of disks that the system supports.
max-volumes	uint32	Number of volumes that the system supports.
max-vdisks	uint32	Number of vdisks that the system supports.
max-luns	uint32	Number of LUNs that the system supports.
max-owned-arrays-per-controller	uint32	Number of vdisks that each controller supports.
max-storage-pools-per-controller	uint32	Not applicable.
max-capi-arrays	uint32	Same as max-vdisks.
max-chunk-size	uint32	Maximum chunk size for vdisks: 512 KB.
min-chunk-size	uint32	Minimum chunk size for vdisks: 16 KB.
physical-position-offset	uint32	Starting index for physical components (enclosures, disks, etc.) in the storage system.
backoff-percentage	uint32	Percentage of disk capacity that is reserved to compensate for minor capacity differences between disk drives so they can be used interchangeably. This is not settable by users. The default is 1 percent.
metadata-size	uint32	Amount of metadata, in blocks, stored on each disk.
max-host-groups-per-storage-pool	uint32	Not applicable.
max-hosts-per-host-group	uint32	Not applicable.
max-volume-groups-per-pool	uint32	Not applicable.
max-volumes-per-volume-group	uint32	Not applicable.
max-snapshot-groups-per-pool	uint32	Not applicable.

Table 80 system-parameters-table properties (continued)

Name	Type	Description
max-snapshots-per-snapshot-group	uint32	Not applicable.
max-midline-per-storage-pool	uint32	Not applicable.
max-standard-per-storage-pool	uint32	Not applicable.
max-performance-per-storage-pool	uint32	Not applicable.
local-controller	string	Controller you are currently logged in to. • A: Controller A. • B: Controller B.
local-controller-numeric	string	Numeric equivalents for local-controller values. • 0: B • 1: A
serial-number	string	Last five digits of the midplane serial number.
external-targetid-control	string	Not used.
external-targetid-control-numeric	string	Not used.
lan-heartbeat	string	Not used.
lan-heartbeat-numeric	string	Not used.
ip-address-mode	string	• CAPI_TWO_IP_ADDRESSES_MODE: Dual controller system has a unique IP address for each controller. • CAPI_ONE_IP_ADDRESS_MODE: Dual controller system has the same IP address for both controllers, only one active at a time.
ip-address-mode-numeric	string	Numeric equivalents for lan-heartbeat values. • 0: CAPI_TWO_IP_ADDRESSES_MODE • 1: CAPI_ONE_IP_ADDRESS_MODE
debug-flags	uint32	For use by service personnel.
enclosure-flags	uint32	For internal use only.
num-global-spares	uint32	Number of global-spare disks defined in the storage system.
dynamic-spare-rescan-rate	uint32	Interval at which the system is scanned for disks automatically designated as spares, if the dynamic spares feature is enabled.
performance-tuning-flags	string	For internal use only.

Table 80 system-parameters-table properties (continued)

Name	Type	Description
performance-tuning-flags-numeric	string	Numeric equivalents for performance-tuning values. • 0: Disabled • 1: Enabled
min-backing-store-size	uint32	Minimum snap-pool size in blocks.

Example

```
# show system-parameters
...
  <OBJECT basetype="system-parameters-table" name="system-parameters" oid="1"
format="pairs">
    <PROPERTY name="ulp-enabled" type="string">true</PROPERTY>
    <PROPERTY name="profiles-enabled" type="string">false</PROPERTY>
    <PROPERTY name="max-ports" type="uint32">8</PROPERTY>
    <PROPERTY name="max-drives" type="uint32">149</PROPERTY>
    <PROPERTY name="max-volumes" type="uint32">1024</PROPERTY>
    <PROPERTY name="max-vdisks" type="uint32">32</PROPERTY>
    <PROPERTY name="max-luns" type="uint32">1024</PROPERTY>
    <PROPERTY name="max-owned-arrays-per-controller" type="uint32">16</PROPERTY>
    <PROPERTY name="max-storage-pools-per-controller" type="uint32">1</PROPERTY>
    <PROPERTY name="max-capi-arrays" type="uint32">32</PROPERTY>
    <PROPERTY name="max-chunk-size" type="uint32">512</PROPERTY>
    <PROPERTY name="min-chunk-size" type="uint32">16</PROPERTY>
    <PROPERTY name="physical-position-offset" type="uint32">0</PROPERTY>
    <PROPERTY name="backoff-percentage" type="uint32">1</PROPERTY>
    <PROPERTY name="metadata-size" type="uint32">32768</PROPERTY>
    <PROPERTY name="max-host-groups-per-storage-pool" type="uint32">0</PROPERTY>
    <PROPERTY name="max-hosts-per-host-group" type="uint32">0</PROPERTY>
    <PROPERTY name="max-volume-groups-per-pool" type="uint32">0</PROPERTY>
    <PROPERTY name="max-volumes-per-volume-group" type="uint32">0</PROPERTY>
    <PROPERTY name="max-snapshot-groups-per-pool" type="uint32">0</PROPERTY>
    <PROPERTY name="max-snapshots-per-snapshot-group" type="uint32">0</PROPERTY>
    <PROPERTY name="max-midline-per-storage-pool" type="uint32">0</PROPERTY>
    <PROPERTY name="max-standard-per-storage-pool" type="uint32">0</PROPERTY>
    <PROPERTY name="max-performance-per-storage-pool" type="uint32">0</PROPERTY>
    <PROPERTY name="local-controller" type="string">B</PROPERTY>
    <PROPERTY name="local-controller-numeric" type="string">0</PROPERTY>
    <PROPERTY name="serial-number" type="string">141CF9</PROPERTY>
    <PROPERTY name="external-targetid-control" type="string">Disabled</PROPERTY>
    <PROPERTY name="external-targetid-control-numeric" type="string">0</PROPERTY>
    <PROPERTY name="lan-heartbeat" type="string">Disabled</PROPERTY>
    <PROPERTY name="lan-heartbeat-numeric" type="string">0</PROPERTY>
    <PROPERTY name="ip-address-mode" type="string">CAPI_TWO_IP_ADDRESSES_MODE</PROPERTY>
    <PROPERTY name="ip-address-mode-numeric" type="string">0</PROPERTY>
    <PROPERTY name="debug-flags" type="uint32">0831fa3b</PROPERTY>
    <PROPERTY name="enclosure-flags" type="uint32">00000005</PROPERTY>
    <PROPERTY name="num-global-spares" type="uint32">0</PROPERTY>
    <PROPERTY name="dynamic-spare-rescan-rate" type="uint32">0</PROPERTY>
    <PROPERTY name="performance-tuning-flags" type="string">Disabled</PROPERTY>
    <PROPERTY name="performance-tuning-flags-numeric" type="string">0</PROPERTY>
    <PROPERTY name="min-backing-store-size" type="uint32">10485760</PROPERTY>
  </OBJECT>
...
```

tasks

Properties

Table 81 tasks properties

Name	Type	Description
name	string	Task name.
type	string	Type of operation this task performs. • TakeSnapshot • ResetSnapshot • VolumeCopy • ReplicateVolume • EnableDSD • DisableDSD
status	string	Task status. • Uninitialized: Task is not yet ready to run. • Ready: Task is ready to run. • Active: Task is running. • Error: Task has an error. • Invalid: Task is invalid.

state	string	Current step of the task.
		• For a TakeSnapshot task:
		  • Start
		  • VerifyVolume
		  • ValidateLicensingLimit
		  • CreateName
		  • CreateSnap
		  • VerifySnap
		  • InspectRetention
		  • FindOldestSnap
		  • UnmapSnap
		  • ResetSnap
		  • RenameSnap
		• For a ResetSnapshot task:
		  • Start
		  • VerifySnap
		  • UnmapSnap
		  • ResetSnap
		• For a VolumeCopy task:
		  • Start
		  • VerifyVolume
		  • CreateName
		  • ObtainMap
		  • UnmapVolume
		  • CreateVolume
		  • RemapVolume
		  • VerifyCreatedVolume

Table 81 tasks properties (continued)

Name	Type	Description

		• For a `ReplicateVolume` task:
		  • `Start`
		  • `VerifyVolume`
		  • `CreateName`
		  • `RepVolume`
		  • `VerifySnap`
		• For an `EnableDSD` or `DisableDSD` task:
		  • `Start`

`error-message`	`string`	Message if an error occurred while processing the task, or blank.
`associated-vdisk-serial`	`string`	For a `VolumeCopy` task, the serial number of the destination vdisk.

Example

```
# show tasks
...
  <OBJECT basetype="tasks" name="task" oid="1" format="pairs">
    <PROPERTY name="name" key="true" type="string">vd02_v001_task001</PROPERTY>
    <PROPERTY name="type" type="string">ReplicateVolume</PROPERTY>
    <PROPERTY name="status" type="string">Ready</PROPERTY>
    <PROPERTY name="state" type="string">Start</PROPERTY>
    <PROPERTY name="error-message" type="string"></PROPERTY>
    <PROPERTY name="associated-vdisk-serial" type="string">SN</PROPERTY>
    ...
  </OBJECT>
...
```

Embedded basetypes

- replicate-volume-tasks
- reset-snapshot-tasks
- snap-tasks
- snapshot-with-retention-tasks
- volume-copy-tasks

time-settings-table

Properties

Table 82 time-settings-table properties

Name	Type	Description
`date-time`	`string`	Date and time, in the format *`year-month-day hour:minutes:seconds`* (UTC), reported by the controller being accessed.
`date-time-numeric`	`string`	Unformatted `date-time` value.
`time-zone-offset`	`string`	The system's time zone as an offset in hours and minutes from UTC. This is shown only if NTP is enabled.
`ntp-state`	`string`	Shows whether Network Time Protocol (NTP) is in use. • `activated`: NTP is enabled. • `deactivated`: NTP is disabled. This is the default.
`ntp-address`	`string`	NTP server IP address, or 0.0.0.0 if not set.

Example

```
# show controller-date
...
  <OBJECT basetype="time-settings-table" name="time-settings-table" oid="1">
    <PROPERTY name="date-time" type="string">2012-02-16 13:12:28</PROPERTY>
    <PROPERTY name="date-time-numeric" type="string">1329397948</PROPERTY>
    <PROPERTY name="time-zone-offset" type="string">-07:00</PROPERTY>
    <PROPERTY name="ntp-state" type="string">Enabled</PROPERTY>
    <PROPERTY name="ntp-address" type="string">10.64.10.1</PROPERTY>
  </OBJECT>
...
```

unhealthy-component

Properties

Table 83 unhealthy-component properties

Name	Type	Description
component-type	string	Component type. • super-cap: Super-capacitor pack. • MC: Management Controller. • port: Host port. • controller: Controller module. • expansion module: Expansion module. • PSU: Power supply unit. • disk: Disk slot. • enclosure: Enclosure. • vdisk: Vdisk.
component-type-numeric	string	Numeric equivalents for component-type values. • 0: super-cap • 1: MC • 2: port • 3: controller • 4: expansion module • 5: PSU • 6: disk • 7: enclosure • 8: vdisk
component-id	string	Component identifier, such as A for controller A.
basetype	string	Component basetype.
primary-key	string	Durable ID of the component.
health	string	Component health. • OK • Degraded • Fault • Unknown • N/A
health-numeric	string	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.

Example

```
# show system
...
    <OBJECT basetype="unhealthy-component" name="unhealthy-component" oid="5"
format="pairs">
      <PROPERTY name="component-type" type="string">management port</PROPERTY>
      <PROPERTY name="component-type-numeric" type="string">15</PROPERTY>
      <PROPERTY name="component-id" type="string">Enclosure 0, Controller A, Management
Port</PROPERTY>
      <PROPERTY name="basetype" type="string">mgmt-port</PROPERTY>
      <PROPERTY name="primary-key" key="true" type="string">mgmtport_a</PROPERTY>
      <PROPERTY name="health" type="string">Degraded</PROPERTY>
      <PROPERTY name="health-numeric" type="string">1</PROPERTY>
      <PROPERTY name="health-reason" type="string">The network port Ethernet cable is
unplugged, or the network is inoperable.</PROPERTY>
      <PROPERTY name="health-recommendation" type="string">- Check that the controller
network port is properly connected to the network.
  - If it is, then check for network problems.</PROPERTY>
    </OBJECT>
...
```

unwritable-cache

Properties

Table 84 unwritable-cache properties

Name	Type	Description
unwritable-a-percentage	uint8	Total percentage of cache memory used for unwritable data in controller A.
unwritable-b-percentage	uint8	Total percentage of cache memory used for unwritable data in controller B.

Example

```
# show unwritable-cache
...
  <OBJECT basetype="unwritable-cache" name="unwritable-system-cache" oid="1"
format="pairs">
    <PROPERTY name="unwritable-a-percentage" type="uint8">0</PROPERTY>
    <PROPERTY name="unwritable-b-percentage" type="uint8">0</PROPERTY>
  </OBJECT>
...
```

users

Properties

Table 85 users properties

Name	Type	Description
username	string	User name.
roles	string	• monitor: View-only access to selected user interfaces. This is the default. • manage: Modify access to selected user interfaces.
user-type	string	The user's level of technical expertise: Novice, Standard, Advanced, or Diagnostic. All user types have access to all commands. The default is Standard.
user-type-numeric	string	Numeric equivalents for user-type values. • 1: Novice • 2: Standard • 3: Advanced • 4: Diagnostic
user-locale	string	Display language for this user. The default is English.
user-locale-numeric	string	Numeric equivalents for user-locale values. • 0: English. • 1: Spanish. • 2: French. • 3: German. • 4: Italian. • 5: Japanese. • 6: Netherlands. • 7: Simplified Chinese. • 8: Traditional Chinese. • 9: Korean.
interface-access-WBI	string	• x: User can use the web-browser interface. This is the default. • (blank): User cannot access this interface.
interface-access-CLI	string	• x: User can use the command-line interface. • (blank): User cannot access this interface. This is the default.
interface-access-FTP	string	• x: User can use the file transfer protocol interface. • (blank): User cannot access this interface. This is the default.
interface-access-SMIS	string	• x: User can use the Storage Management Initiative Specification (SMI-S) interface. • (blank): User cannot access this interface. This is the default.
interface-access-SNMP	string	• U: The user can access the SNMPv3 interface and view the MIB. • T: The user can access the SNMPv3 interface and receive trap notifications. • (blank): User cannot access this interface. This is the default.
storage-size-base	uint8	The base for entry and display of storage-space sizes: • 2: Sizes are shown as powers of 2, using 1024 as a divisor for each magnitude. • 10: Sizes are shown as powers of 10, using 1000 as a divisor for each magnitude. This 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.

Table 85 users properties (continued)

Name	Type	Description
storage-size-precision	uint8	The number of decimal places (1–10) for display of storage-space sizes. The default is 1.
storage-size-units	string	The unit for display of storage-space sizes. • auto: Lets the system determine the proper unit for a size. This is the default. • MB: Megabytes. • GB: Gigabytes. • TB: Terabytes. Based on the precision setting, if the selected unit is too large to meaningfully display a size, the system uses a smaller unit for that size. For example, if units is set to TB, precision is set to 1, and base is set to 10, the size 0.11709 TB is instead shown as 117.1 GB.
storage-size-units-numeric	string	Numeric equivalents for storage-size-units values. • 0: auto • 1: MB • 2: GB • 3: TB
temperature-scale	string	• Celsius: Use the Celsius scale to display temperature values. This is the default. • Fahrenheit: Use the Fahrenheit scale to display temperature values.
temperature-scale-numeric	string	Numeric equivalents for temperature-scale values. • 0: Fahrenheit • 1: Celsius
timeout	uint32	Time in seconds that the session can be idle before it automatically ends. Valid values are 120–43200 seconds (2–720 minutes). The default is 1800 seconds (30 minutes).
ui-refresh	uint16	User-interface refresh rate, which is 30 seconds.
authentication-type		For an SNMPv3 user, this specifies whether to use a security authentication protocol. Authentication uses the user password. • none: No authentication. • MD5: MD5 authentication. This is the default. • SHA: SHA (Secure Hash Algorithm) authentication.
authentication-type-numeric		Numeric equivalents for authentication-type values. • 0: none • 1: MD5 • 2: SHA
privacy-type		For an SNMPv3 user, this specifies whether to use a security encryption protocol. This parameter requires the privacy-password property and the authentication-type property. • none: No encryption. This is the default. • DES: Data Encryption Standard. • AES: Advanced Encryption Standard.
privacy-type-numeric		Numeric equivalents for privacy-type values. • 0: none • 1: DES • 2: AES

Table 85 users properties (continued)

Name	Type	Description
password	string	User password. For a standard user the password is represented by eight asterisks. For an SNMPv3 user this is the authentication password; it is shown in clear text for reference when configuring users in the corresponding management application.
privacy-password	string	Encryption password for an SNMPv3 user whose privacy type is set to DES or AES. The password is shown in clear text for reference when configuring users in the corresponding management application.
trap-destination	string	For an SNMPv3 user whose interface-access-SNMP property is set to snmptarget, this specifies the IP address of the host that will receive SNMP traps.

Example

```
# show users
...
  <OBJECT basetype="users" name="user" oid="1" format="rows">
    <PROPERTY name="username" key="true" type="string">d</PROPERTY>
    <PROPERTY name="roles" type="string">manage,monitor</PROPERTY>
    <PROPERTY name="user-type" type="string">Standard</PROPERTY>
    <PROPERTY name="user-type-numeric" type="string">2</PROPERTY>
    <PROPERTY name="user-locale" type="string">English</PROPERTY>
    <PROPERTY name="user-locale-numeric" type="string">0</PROPERTY>
    <PROPERTY name="interface-access-WBI" type="string">x</PROPERTY>
    <PROPERTY name="interface-access-CLI" type="string">x</PROPERTY>
    <PROPERTY name="interface-access-FTP" type="string"></PROPERTY>
    <PROPERTY name="interface-access-SMIS" type="string"></PROPERTY>
    <PROPERTY name="interface-access-SNMP" type="string"></PROPERTY>
    <PROPERTY name="storage-size-base" type="uint8">10</PROPERTY>
    <PROPERTY name="storage-size-precision" type="uint8">1</PROPERTY>
    <PROPERTY name="storage-size-units" type="string">Auto</PROPERTY>
    <PROPERTY name="storage-size-units-numeric" type="string">0</PROPERTY>
    <PROPERTY name="temperature-scale" type="string">Fahrenheit</PROPERTY>
    <PROPERTY name="temperature-scale-numeric" type="string">0</PROPERTY>
    <PROPERTY name="timeout" type="uint32">1800</PROPERTY>
    <PROPERTY name="ui-refresh" type="uint16">30</PROPERTY>
    <PROPERTY name="authentication-type" type="string"></PROPERTY>
    <PROPERTY name="privacy-type" type="string"></PROPERTY>
    <PROPERTY name="password" type="string">********</PROPERTY>
    <PROPERTY name="privacy-password" type="string">********</PROPERTY>
    <PROPERTY name="trap-destination" type="string"></PROPERTY>
  </OBJECT>
...
```

vdisk-hist-statistics

Properties

Table 86 vdisk-hist-statistics properties

Name	Type	Description
total-data-transferred	string	Total amount of data read and written since the last sampling time.
total-data-transferred-numeric	uint64	Unformatted total-data-transferred value.
data-read	string	Amount of data read since the last sampling time.
data-read-numeric	uint64	Unformatted data-read value.
data-written	string	Amount of data written since the last sampling time.
data-written-numeric	uint64	Unformatted data-written value.
total-bytes-per-second	string	Data transfer rate, in bytes per second, since the last sampling time. This is the sum of read-bytes-per-second and write-bytes-per-second.
total-bytes-per-second-numeric	uint64	Unformatted total-bytes-per-second value.
read-bytes-per-second	string	Data transfer rate, in bytes per second, for read operations since the last sampling time.
read-bytes-per-second-numeric	uint64	Unformatted read-bytes-per-second value.
write-bytes-per-second	string	Data transfer rate, in bytes per second, for write operations since the last sampling time.
write-bytes-per-second-numeric	uint64	Unformatted write-bytes-per-second value.
sample-time	string	Date and time, in the format *year-month-day hour*:*minutes*:*seconds*, when the data sample was taken.
sample-time-numeric	uint32	Unformatted sample-time value.

Example

```
# show vdisk-statistics vd01 historical
...
    <OBJECT basetype="vdisk-hist-statistics" name="vdisk-hist-statistics" oid="2"
format="rows">
      <PROPERTY name="total-data-transferred" units="MB" type="string">30.5MB</PROPERTY>
      <PROPERTY name="total-data-transferred-numeric" type="string">30562816</PROPERTY>
      <PROPERTY name="data-read" units="MB" type="string">14.6MB</PROPERTY>
      <PROPERTY name="data-read-numeric" type="string">14646784</PROPERTY>
      <PROPERTY name="data-written" units="MB" type="string">15.9MB</PROPERTY>
      <PROPERTY name="data-written-numeric" type="string">15916032</PROPERTY>
      <PROPERTY name="total-bytes-per-sec" units="KB" type="string">33.7KB</PROPERTY>
      <PROPERTY name="total-bytes-per-sec-numeric" type="string">33792</PROPERTY>
      <PROPERTY name="read-bytes-per-sec" units="KB" type="string">15.8KB</PROPERTY>
      <PROPERTY name="read-bytes-per-sec-numeric" type="string">15872</PROPERTY>
      <PROPERTY name="write-bytes-per-sec" units="KB" type="string">17.4KB</PROPERTY>
      <PROPERTY name="write-bytes-per-sec-numeric" type="string">17408</PROPERTY>
      <PROPERTY name="sample-time" type="string">2012-02-16 13:00:00</PROPERTY>
```

```
      <PROPERTY name="sample-time-numeric" type="string">1329397200</PROPERTY>
    </OBJECT>
...
```

vdisk-statistics

Properties

Table 87 vdisk-statistics properties

Name	Type	Description
name	string	Vdisk name.
serial-number	string	Vdisk serial number.
bytes-per-second	string	Data transfer rate calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	string	Unformatted bytes-per-second value.
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
number-of-reads	uint64	Number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	Number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	string	Unformatted data-read value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	string	Unformatted data-written value.
avg-rsp-time	string	Average response time in microseconds for read and write operations, calculated over the interval since these statistics were last requested or reset.
avg-read-rsp-time	string	Average response time in microseconds for all read operations, calculated over the interval since these statistics were last requested or reset.
avg-write-rsp-time	string	Average response time in microseconds for all write operations, calculated over the interval since these statistics were last requested or reset.
reset-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	string	Unformatted reset-time value.
start-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling started for the iops and bytes-per-second values.
start-sample-time-numeric	string	Unformatted start-sample-time value.
stop-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling stopped for the iops and bytes-per-second values.
stop-sample-time-numeric	string	Unformatted stop-sample-time value.

Example

```
# show vdisk-statistics
...
  <OBJECT basetype="vdisk-statistics" name="vdisk-statistics" oid="1" format="rows">
    <PROPERTY name="name" type="string">vd02</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="bytes-per-second" units="B" type="string">0B</PROPERTY>
    <PROPERTY name="bytes-per-second-numeric" type="string">0</PROPERTY>
    <PROPERTY name="iops" type="uint32">0</PROPERTY>
    <PROPERTY name="number-of-reads" type="uint64">470</PROPERTY>
    <PROPERTY name="number-of-writes" type="uint64">313154</PROPERTY>
    <PROPERTY name="data-read" units="MB" type="string">21.0MB</PROPERTY>
    <PROPERTY name="data-read-numeric" type="string">21078016</PROPERTY>
    <PROPERTY name="data-written" units="GB" type="string">80.0GB</PROPERTY>
    <PROPERTY name="data-written-numeric" type="string">80096836608</PROPERTY>
    <PROPERTY name="avg-rsp-time" type="uint32">24884</PROPERTY>
    <PROPERTY name="avg-read-rsp-time" type="uint32">3003</PROPERTY>
    <PROPERTY name="avg-write-rsp-time" type="uint32">24917</PROPERTY>
    <PROPERTY name="reset-time" type="string">2012-02-16 07:47:02</PROPERTY>
    <PROPERTY name="reset-time-numeric" type="string">1329378422</PROPERTY>
    <PROPERTY name="start-sample-time" type="string">2012-02-24 12:47:34</PROPERTY>
    <PROPERTY name="start-sample-time-numeric" type="string">1330087654</PROPERTY>
    <PROPERTY name="stop-sample-time" type="string">2012-02-29 10:19:57</PROPERTY>
    <PROPERTY name="stop-sample-time-numeric" type="string">1330510797</PROPERTY>
  </OBJECT>
...
```

versions

Properties

Table 88 versions properties

Name	Type	Description
sc-cpu-type	string	Storage Controller processor type.
bundle-version	string	Firmware bundle version.
build-date	string	Firmware bundle build date.
sc-fw	string	Storage Controller firmware version.
sc-baselevel	string	Storage Controller firmware base level.
sc-memory	string	Storage Controller memory-controller FPGA firmware version.
sc-loader	string	Storage Controller loader firmware version.
capi-version	string	Configuration API (CAPI) version.
mc-fw	string	Management Controller firmware version.
mc-loader	string	Management Controller loader firmware version.
ec-fw	string	Expander Controller firmware version.
pld-rev	string	Complex Programmable Logic Device (CPLD) firmware version.
hw-rev	string	Controller hardware version.
him-rev	string	Host interface module revision.
him-model	string	Host interface module model.
backplane-type	uint8	Backplane type.
host-channel_ revision	uint8	Host interface hardware (chip) version.
disk-channel_ revision	uint8	Disk interface hardware (chip) version.
mrc-version	uint8	Memory Reference Code (MRC) version for Storage Controller boot Flash. For models other than 3XX3, the value is 0, which means "not applicable."

Example

```
# versions
...
  <OBJECT basetype="versions" name="controller-a-versions" oid="1" format="pairs">
    <PROPERTY name="sc-cpu-type" type="string">Intel Tolapai 1200MHz</PROPERTY>
    <PROPERTY name="bundle-version" type="string">TS240R018</PROPERTY>
    <PROPERTY name="build-date" type="string">Thu Feb  9 11:26:56 MST 2012</PROPERTY>
    <PROPERTY name="sc-fw" type="string">T240R14-01</PROPERTY>
    <PROPERTY name="sc-baselevel" type="string">T240R14-01</PROPERTY>
    <PROPERTY name="sc-memory" type="string">F400R02</PROPERTY>
    <PROPERTY name="sc-loader" type="string">23.008</PROPERTY>
    <PROPERTY name="capi-version" type="string">3.17</PROPERTY>
    <PROPERTY name="mc-fw" type="string">L240R017-01</PROPERTY>
    <PROPERTY name="mc-loader" type="string">2.5</PROPERTY>
    <PROPERTY name="ec-fw" type="string">2018</PROPERTY>
    <PROPERTY name="pld-rev" type="string">23</PROPERTY>
    <PROPERTY name="hw-rev" type="string">53</PROPERTY>
    <PROPERTY name="him-rev" type="string">50</PROPERTY>
    <PROPERTY name="him-model" type="string">0</PROPERTY>
    <PROPERTY name="backplane-type" type="uint8">7</PROPERTY>
    <PROPERTY name="host-channel_revision" type="uint8">2</PROPERTY>
    <PROPERTY name="disk-channel_revision" type="uint8">2</PROPERTY>
```

```
    <PROPERTY name="mrc-version" type="uint8">0</PROPERTY>
  </OBJECT>
...
```

virtual-disk-summary

Properties

Table 89 virtual-disk-summary properties

Name	Type	Description
name	string	Vdisk name.
serial-number	string	Vdisk serial number.

Example

```
# show vdisk-statistics vd01 historical
...
  <OBJECT basetype="virtual-disk-summary" name="virtual-disk" oid="1" format="rows">
    <PROPERTY name="name" type="string">vd01</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    ...
  </OBJECT>
...
```

Embedded basetypes

- vdisk-hist-statistics

virtual-disks

Properties

Table 90 virtual-disks properties

Name	Type	Description
name	string	Vdisk name.
size	string	Vdisk capacity, formatted to use the current base, precision, and units.
size-numeric	string	Unformatted size value in 512-byte blocks.
freespace	string	Amount of free space in the vdisk, formatted to use the current base, precision, and units.
freespace-numeric	string	Unformatted freespace value in 512-byte blocks.
owner	string	Either the preferred owner during normal operation or the partner controller when the preferred owner is offline. • A: Controller A. • B: Controller B.
owner-numeric	string	Numeric equivalents for owner values. • 0: B • 1: A
preferred-owner	string	Controller that owns the vdisk and its volumes during normal operation. • A: Controller A. • B: Controller B.
preferred-owner-numeric	string	Numeric equivalents for preferred-owner values. • 0: B • 1: A
raidtype	string	Vdisk RAID level. • NRAID • RAID0 • RAID1 • RAID3 • RAID5 • RAID6 • RAID10 • RAID50
raidtype-numeric	string	Numeric equivalents for raidtype values. • 0: RAID0 • 1: RAID1 • 3: RAID3 • 5: RAID5 • 6: NRAID • 8: RAID50 • 10: RAID10 • 11: RAID6
diskcount	uint16	Number of disks in the vdisk.
sparecount	uint16	Number of spare disks assigned to the vdisk.

Table 90 virtual-disks properties (continued)

Name	Type	Description
chunksize	string	• For RAID levels except NRAID, RAID 1, and RAID 50, the configured chunk size for the vdisk. • For NRAID and RAID 1, chunk size has no meaning and is therefore shown as not applicable (N/A). • For RAID 50, the vdisk chunk size calculated as: *configured-chunk-size* x (*subvdisk-members* - 1). For a vdisk configured to use 32-KB chunk size and 4-disk subvdisks, the value would be 96k (32KB x 3).
status	string	Vdisk status. • CRIT: Critical. The vdisk is online but isn't fault tolerant because some of its disks are down. • 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. • OFFL: Offline. Either the vdisk 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 vdisk 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 vdisk is QTCR or QTDN, the vdisk is automatically dequarantined. • QTDN: Quarantined with a down disk. The RAID-6 vdisk has one inaccessible disk. The vdisk is fault tolerant but degraded. If the inaccessible disks come online or if after 60 seconds from being quarantined the vdisk is QTCR or QTDN, the vdisk is automatically dequarantined. • QTOF: Quarantined offline. The vdisk is offline with multiple inaccessible disks causing user data to be incomplete, or is an NRAID or RAID-0 vdisk. • STOP: The vdisk is stopped. • UP: Up. The vdisk is online and does not have fault-tolerant attributes. • UNKN: Unknown.
status-numeric	string	Numeric equivalents for status values. • 0: FTOL • 1: FTDN • 2: CRIT • 3: OFFL • 4: QTCR • 5: QTOF • 6: QTDN • 7: STOP • 250: UP • *other*: UNKN
lun	uint32	Not used.
min-drive-size	string	Minimum disk size that can this vdisk can use, formatted to use the current base, precision, and units.
min-drive-size-numeric	string	Unformatted min-drive-size value in 512-byte blocks.
create-date	string	Date and time, in the format *year-month-day hour:minutes:seconds* (UTC), when the vdisk was created.
create-date-numeric	string	Unformatted create-date value.

Table 90 virtual-disks properties (continued)

Name	Type	Description
cache-read-ahead	blocks	Not used.
cache-read-ahead-numeric	string	Not used.
cache-flush-period	uint32	Not used.
read-ahead-enabled	string	Not used.
read-ahead-enabled-numeric	string	Not used.
write-back-enabled	string	Not used.
write-back-enabled-numeric	string	Not used.
number-of-reads	uint32	Number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint32	Number of write operations since these statistics were last reset or since the controller was restarted.
total-sectors-read	uint32	Total sectors read.
total-sectors-written	uint32	Total sectors written.
job-running	string	Same as current-job.
current-job	string	Job running on the vdisk, if any. • (blank): No job is running. • DRSC: The disk is being scrubbed. • EXPD: The vdisk is being expanded. • INIT: The vdisk is initializing. • RCON: The vdisk is being reconstructed. • VRFY: The vdisk is being verified. • VRSC: The vdisk is being scrubbed.
current-job-numeric	string	Numeric equivalents for current-job values. • 0: (blank) • 2: INIT • 3: RCON • 4: VRFY • 5: EXPD • 6: VRSC • 7: DRSC
current-job-completion	string	• 0%–99%: Percent complete of running job. • (blank): No job is running (job has completed).
target-id	uint32	Not used.
num-array-partitions	uint32	Number of volumes in the vdisk.
largest-free-partition-space	string	The largest contiguous space in which a volume can be created. The value is formatted to use the current base, precision, and units.

Table 90 virtual-disks properties (continued)

Name	Type	Description
largest-free-partition-space-numeric	string	Unformatted largest-free-partition-space value in 512-byte blocks.
num-drives-per-low-level-array	uint8	• For a RAID-10 or RAID-50 vdisk, the number of disks in each sub-vdisk. • For other RAID levels, 1.
num-expansion-partitions	uint8	Not used.
num-partition-segments	uint8	Number of free segments available for expansion of volumes.
new-partition-lba	string	Maximum number of 512-byte 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 vdisk will reduce this amount.
new-partition-lba-numeric	string	Unformatted new-partition-lba value in 512-byte blocks.
array-drive-type	string	Type of disk used in the vdisk. • SAS: Dual-port SAS. • SAS-S: Single-port SAS. • SATA: Dual-port SATA. • SATA-S: Single-port SATA. • sSATA: Dual-port SATA SSD. • sSAS: Dual-port SAS SSD.
array-drive-type-numeric	string	Numeric equivalents for array-drive-type values. • 3: SATA • 4: SAS • 5: SATA-S • 6: SAS-S • 7: sSATA • 8: sSAS
is-job-auto-abortable	string	• false: The current job must be manually aborted before you can delete the vdisk. • true: The current job will automatically abort if you delete the vdisk.
is-job-auto-abortable-numeric	string	• 0: false • 1: true
serial-number	string	Vdisk serial number.
blocks	uint64	Unformatted size value in 512-byte blocks.
disk-dsd-enable-vdisk	string	• Disabled: DSD is disabled for the vdisk. This is the default. • Enabled - all spinning: DSD is enabled for the vdisk. • Partial spin-down: DSD is enabled for the vdisk and its disks are partially spun down to conserve power. • Full spin-down: DSD is enabled for the vdisk and its disks are fully spun down to conserve power.
disk-dsd-enable-vdisk-numeric	string	• 0: Disabled • 1: Enabled - all spinning • 2: Partial spin-down • 3: Full spin-down

Table 90 virtual-disks properties (continued)

Name	Type	Description
disk-dsd-delay-vdisk	uint32	The period of inactivity after which the vdisk's disks and dedicated spares automatically spin down, from 1–360 minutes. DSD is enabled by a value in this range, or is disabled by the value 0.
total-data-transferred	bytes	Total amount of data read and written since the last sampling time.
total-data-transferred-numeric	uint64	Unformatted total-data-transferred value.
total-bytes-per-sec	bytes	Data transfer rate, in bytes per second, since the last sampling time.
total-bytes-per-sec-numeric	uint64	Unformatted total-bytes-per-second value.
health	string	• OK • Degraded • Fault • Unknown
health-numeric	string	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown
health-reason	string	If Health is not OK, the reason for the health state.
health-recommendation	string	If Health is not OK, the recommended actions to take to resolve the health issue.

Example

```
# show vdisks
...
  <OBJECT basetype="virtual-disks" name="virtual-disk" oid="1" format="rows">
    <PROPERTY name="name" type="string">vd01</PROPERTY>
    <PROPERTY name="size" units="GB" type="string">1198.7GB</PROPERTY>
    <PROPERTY name="size-numeric" units="blocks512" type="string">2341275136</PROPERTY>
    <PROPERTY name="freespace" units="GB" type="string">1027.3GB</PROPERTY>
    <PROPERTY name="freespace-numeric" units="blocks512" type="string">2006570880
</PROPERTY>
    <PROPERTY name="owner" type="string">B</PROPERTY>
    <PROPERTY name="owner-numeric" type="string">0</PROPERTY>
    <PROPERTY name="preferred-owner" type="string">B</PROPERTY>
    <PROPERTY name="preferred-owner-numeric" type="string">0</PROPERTY>
    <PROPERTY name="raidtype" type="string">RAID5</PROPERTY>
    <PROPERTY name="raidtype-numeric" type="string">5</PROPERTY>
    <PROPERTY name="diskcount" type="uint16">5</PROPERTY>
    <PROPERTY name="sparecount" type="uint16">0</PROPERTY>
    <PROPERTY name="chunksize" type="string">64k</PROPERTY>
    <PROPERTY name="status" type="string">FTOL</PROPERTY>
    <PROPERTY name="status-numeric" type="string">0</PROPERTY>
    <PROPERTY name="lun" type="uint32">-1</PROPERTY>
    <PROPERTY name="min-drive-size" units="GB" type="string">299.6GB</PROPERTY>
    <PROPERTY name="min-drive-size-numeric" units="blocks512" type="string">585318784
</PROPERTY>
    <PROPERTY name="create-date" type="string">2011-10-11 16:19:39</PROPERTY>
    <PROPERTY name="create-date-numeric" type="string">1318349979</PROPERTY>
    <PROPERTY name="cache-read-ahead" units="GB" type="string">2199.0GB</PROPERTY>
    <PROPERTY name="cache-read-ahead-numeric" units="blocks512" type="string">4294967295
</PROPERTY>
```

```
    <PROPERTY name="cache-flush-period" type="uint32">-1</PROPERTY>
    <PROPERTY name="read-ahead-enabled" type="string">Enabled</PROPERTY>
    <PROPERTY name="read-ahead-enabled-numeric" type="string">1</PROPERTY>
    <PROPERTY name="write-back-enabled" type="string">Disabled</PROPERTY>
    <PROPERTY name="write-back-enabled-numeric" type="string">0</PROPERTY>
    <PROPERTY name="number-of-reads" type="uint32">0</PROPERTY>
    <PROPERTY name="number-of-writes" type="uint32">0</PROPERTY>
    <PROPERTY name="total-sectors-read" type="uint32">0</PROPERTY>
    <PROPERTY name="total-sectors-written" type="uint32">0</PROPERTY>
    <PROPERTY name="job-running" type="string"></PROPERTY>
    <PROPERTY name="current-job" type="string"></PROPERTY>
    <PROPERTY name="current-job-numeric" type="string">0</PROPERTY>
    <PROPERTY name="current-job-completion" type="string"></PROPERTY>
    <PROPERTY name="target-id" type="uint32">255</PROPERTY>
    <PROPERTY name="num-array-partitions" type="uint32">12</PROPERTY>
    <PROPERTY name="largest-free-partition-space" units="GB" type="string">1027.3GB
</PROPERTY>
    <PROPERTY name="largest-free-partition-space-numeric" units="blocks512"
type="string">2006570880</PROPERTY>
    <PROPERTY name="num-drives-per-low-level-array" type="uint8">1</PROPERTY>
    <PROPERTY name="num-expansion-partitions" type="uint8">0</PROPERTY>
    <PROPERTY name="num-partition-segments" type="uint8">2</PROPERTY>
    <PROPERTY name="new-partition-lba" units="GB" type="string">1027.3GB</PROPERTY>
    <PROPERTY name="new-partition-lba-numeric" units="blocks512" type="string">2006570880
</PROPERTY>
    <PROPERTY name="array-drive-type" type="string">SAS</PROPERTY>
    <PROPERTY name="array-drive-type-numeric" type="string">4</PROPERTY>
    <PROPERTY name="is-job-auto-abortable" type="string">false</PROPERTY>
    <PROPERTY name="is-job-auto-abortable-numeric" type="string">0</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="blocks" blocksize="512" type="uint64">2341275136</PROPERTY>
    <PROPERTY name="disk-dsd-enable-vdisk" type="string">Disabled</PROPERTY>
    <PROPERTY name="disk-dsd-enable-vdisk-numeric" type="string">0</PROPERTY>
    <PROPERTY name="disk-dsd-delay-vdisk" type="uint32">0</PROPERTY>
    <PROPERTY name="total-data-transferred" units="KB" type="string">3524.6KB</PROPERTY>
    <PROPERTY name="total-data-transferred-numeric" type="string">3524608</PROPERTY>
    <PROPERTY name="total-bytes-per-sec" units="B" type="string">3584B</PROPERTY>
    <PROPERTY name="total-bytes-per-sec-numeric" type="string">3584</PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
  </OBJECT>
...
```

Embedded basetypes

- unhealthy-component

volume-copy-status

Properties

Table 91 volume-copy-status properties

Name	Type	Description
vc_volume_name	string	Destination volume name.
serial-number	string	Destination volume serial number.
virtual-disk-name	string	Destination vdisk name.
source-volume	string	Source volume name.
progress	string	Percent complete of the volume copy (0%–99%).
status	string	• Unavailable: A volume copy is in progress to the destination volume. • Suspended: The source volume went offline while a volume copy was in progress. When the source volume comes back online, the copy process resumes from the point where it stopped.
status-reason	string	More information about the status value.

Example

```
# show volumecopy-status
...
  <OBJECT basetype="volume-copy-status" name="volume" oid="1" format="rows">
    <PROPERTY name="vc_volume_name" type="string">vd02_v001_c001</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="virtual-disk-name" type="string">vd02</PROPERTY>
    <PROPERTY name="source-volume" type="string">vd02_v001</PROPERTY>
    <PROPERTY name="progress" type="string">6%</PROPERTY>
    <PROPERTY name="status" type="string">Unavailable</PROPERTY>
    <PROPERTY name="status-reason" type="string">VC In Progress</PROPERTY>
  </OBJECT>
...
```

volume-copy-tasks

Properties

Table 92 volume-copy-tasks properties

Name	Type	Description
source-volume-name	string	Source volume name.
source-volume-serial	string	Source volume serial number.
destination-vdisk-name	string	Destination vdisk name.
destination-vdisk-serial	string	Destination vdisk serial number.
destination-volume-prefix	string	Label that identifies copies created by this task. Volume names have the format prefix_s#, where # starts at 001.
include-modified-data	string	• modified: The copy includes modified snapshot data. • preserved: The copy excludes modified snapshot data.
last-created	string	Name of the last volume created by the task, or blank.

Example

```
# show tasks
...
    <OBJECT basetype="volume-copy-tasks" name="task-volume-copy" oid="8" format="pairs">
      <PROPERTY name="source-volume-name" type="string">vd02_v001</PROPERTY>
      <PROPERTY name="source-volume-serial" type="string">SN</PROPERTY>
      <PROPERTY name="destination-vdisk-name" type="string">vd02</PROPERTY>
      <PROPERTY name="destination-pool-name" type="string">vd02</PROPERTY>
      <PROPERTY name="destination-vdisk-serial" type="string">SN</PROPERTY>
      <PROPERTY name="destination-pool-serial" type="string">SN</PROPERTY>
      <PROPERTY name="destination-volume-prefix" type="string">vd02_v001_01</PROPERTY>
      <PROPERTY name="include-modified-data" type="string">preserved</PROPERTY>
      <PROPERTY name="last-created" type="string"></PROPERTY>
    </OBJECT>
...
```

volume-names

Properties

Table 93 volume-names properties

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

Example

```
# show volume-names
...
  <OBJECT basetype="volume-names" name="volume-name" oid="1" format="rows">
    <PROPERTY name="volume-name" type="string">vd01_v001</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
  </OBJECT>
...
```

volume-reservations

Properties

Table 94 volume-reservations properties

Name	Type	Description
volume-name	string	Volume name.
serial-number	string	Volume serial number.
reservation-active	string	• Free: The volume is not reserved. • Reserved: The volume has been reserved by a host.
reservation-active-numeric	string	Numeric equivalents for reservation-active values. • 0: Free • 1: Reserved
host-id	string	Host WWPN or iSCSI node name.
port	string	Controller ID and port number.
reserve-type	string	The reservation type. • Undefined: The volume has no persistent reservations. • Write Exclusive: Write commands are only allowed for a single reservation holder. • Exclusive Access: Certain access (read, write) commands are only allowed for a single reservation holder. • Write Exclusive - Registrants Only: Write commands are only allowed for registered hosts. There is a single reservation holder. • Exclusive Access - Registrants Only: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder. • Write Exclusive - All Registrants: Write commands are only allowed for registered hosts. There is a single reservation holder. • Exclusive Access - All Registrants: Certain access (read, write) commands are only allowed for registered hosts. There is a single reservation holder.
reserve-type-numeric	string	Numeric equivalents for reserve-type values. • 0: Undefined • 1: Write Exclusive • 3: Exclusive Access • 5: Write Exclusive - Registrants Only • 6: Exclusive Access - Registrants Only • 7: Write Exclusive - All Registrants • 8: Exclusive Access - All Registrants

Example

```
# show volume-reservations all
...
  <OBJECT basetype="volume-reservations" name="volume-reservations" oid="1"
format="rows">
    <PROPERTY name="volume-name" type="string">spvd02_v001</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="reservation-active" type="string">Free</PROPERTY>
    <PROPERTY name="reservation-active-numeric" type="string">0</PROPERTY>
    <PROPERTY name="host-id" key="true" type="string"></PROPERTY>
    <PROPERTY name="port" type="string"></PROPERTY>
    <PROPERTY name="reserve-type" type="string">Undefined</PROPERTY>
```

```
    <PROPERTY name="reserve-type-numeric" type="string">0</PROPERTY>
  </OBJECT>
...
```

volumes

Properties

Table 95 volumes properties

Name	Type	Description
virtual-disk-name	string	Vdisk name.
volume-name	string	Volume name.
size	string	Volume capacity, formatted to use the current base, precision, and units.
size-numeric	string	Unformatted size value in 512-byte blocks.
preferred-owner	string	Controller that owns the volume during normal operation. • A: Controller A. • B: Controller B.
preferred-owner-numeric	string	Numeric equivalents for preferred-owner values. • 0: B • 1: A
owner	string	Either the preferred owner during normal operation or the partner controller when the preferred owner is offline. • A: Controller A. • B: Controller B.
owner-numeric	string	Numeric equivalents for owner values. • 0: B • 1: A
serial-number	string	Volume serial number.
write-policy	string	• write-back: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput. This is the default. • write-through: Write-through caching significantly impacts performance by waiting for data to be completely written to disk before signaling the host that the write is complete. Use this setting only when operating in an environment with low or no fault tolerance.
write-policy-numeric	string	Numeric equivalents for write-policy values. • 0: write-through • 1: write-back
cache-optimization	string	• standard: Optimizes cache for both sequential and random reads. Appropriate for applications that read and write small files in random order, such as transaction-based and database update applications. This is the default. • no-mirror: When this mode is enabled, each controller stops mirroring its cache metadata to the partner controller. This improves write I/O response time but at the risk of losing data during a failover. ULP behavior is not affected, with the exception that during failover any write data in cache will be lost.
cache-optimization-numeric	string	Numeric equivalents for cache-optimization values. • 0: standard • 2: no-mirror

Table 95 volumes properties (continued)

Name	Type	Description
read-ahead-size	string	The volume's read-ahead cache setting. • Disabled: Read-ahead caching is disabled. • Default: One chunk for the first access in a sequential read and one stripe for all subsequent accesses. • Maximum: Maximum read-ahead size calculated by the controller. • 64 KB, 128 KB, 256 KB, 512 KB, 1 MB, 2 MB, 4 MB, 8 MB, 16 MB, 32 MB: Size selected by a user.
read-ahead-size-numeric	string	Numeric equivalents for read-ahead-size values. • -1: Default • 0: Disabled • 65536: 64 KB • 131072: 128 KB • 262144: 256 KB • 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	• standard: Standard volume. • standard*: Destination of an in-progress volume copy and cannot be mounted until the copy is complete. • snap-pool: Snap-pool volume. • master volume: Master volume. • snapshot: Snapshot volume. • replication source: Source for an in-progress replication to a secondary volume
volume-type-numeric	string	Numeric equivalents for volume-type values. • 0: standard • 1: snap-pool • 2: master volume • 3: snapshot • 4: standard* • 8: replication source
volume-class	string	• standard: Standard volume, not enabled for snapshots. • PTSNAP: Snapshot-related volume such as a master volume, snap pool, or snapshot. • Proxy: Destination of an in-progress replication from a remote volume, which when complete will change to type snapshot.
volume-class-numeric	string	Numeric equivalents for volume-class values. • 0: standard • 1: PTSNAP • 3: Proxy

Table 95 volumes properties (continued)

Name	Type	Description
volume-qualifier	string	• N/A: Non-replication-specific volume such as a standard volume, master volume, snapshot, or snap pool. • RSR: Replication-specific volume, such as a primary volume, secondary volume, replication snapshot, or replication image. • RSR (DRM Promoted Secondary): During an actual site failover (not a test failover), the replication set's primary and secondary volumes are shown as primary volumes with a primary-volume conflict. This qualifier enables host-based Storage Replication Adapter (SRA) software to determine which volume is the failed-over secondary volume for disaster recovery management (DRM). If both systems are online and the communication link between them is up, both systems will show similar information. When the SRA completes a restore-replication or reverse-replication operation, this volume will be shown with the RSR qualifier.
volume-qualifier-numeric	string	Numeric equivalents for volume-qualifier values. • 0: N/A • 2: RSR • 6: RSR (DRM Promoted Secondary)
blocks	uint64	Unformatted size value in 512-byte blocks.
capabilities	string	For internal use only.
volume-parent	string	Parent volume serial number. For example, the serial number of a snapshot's master volume.
snap-pool	string	Snap pool serial number.
replication-set	string	Replication set serial number.
attributes	string	Shows whether the volume's disks are single pathed.
virtual-disk-serial	string	Vdisk serial number.
volume-description	string	• Blank by default.
wwn	string	World Wide Name of the volume, used by host-based Storage Replication Adapter (SRA) software to identify the volume.
progress	string	For a volume-copy operation, the percent complete (0%–99%). The default value is 0%.
progress-numeric	string	Unformatted progress value.
container-name	string	Vdisk name.
container-serial	string	Vdisk serial number.
health	string	• OK • Degraded • Fault • Unknown
health-numeric	string	Numeric equivalents for health values. • 0: OK • 1: Degraded • 2: Fault • 3: Unknown

Table 95 volumes properties (continued)

Name	Type	Description
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.

Example

```
# show volumes
...
  <OBJECT basetype="volumes" name="volume" oid="1" format="rows">
    <PROPERTY name="virtual-disk-name" type="string">RSR1A</PROPERTY>
    <PROPERTY name="volume-name" type="string">RSR1AVol1</PROPERTY>
    <PROPERTY name="size" units="GB" type="string">99.9GB</PROPERTY>
    <PROPERTY name="size-numeric" units="blocks512" type="string">195312384</PROPERTY>
    <PROPERTY name="preferred-owner" type="string">A</PROPERTY>
    <PROPERTY name="preferred-owner-numeric" type="string">1</PROPERTY>
    <PROPERTY name="owner" type="string">A</PROPERTY>
    <PROPERTY name="owner-numeric" type="string">1</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="write-policy" type="string">write-back</PROPERTY>
    <PROPERTY name="write-policy-numeric" type="string">1</PROPERTY>
    <PROPERTY name="cache-optimization" type="string">standard</PROPERTY>
    <PROPERTY name="cache-optimization-numeric" type="string">0</PROPERTY>
    <PROPERTY name="read-ahead-size" type="string">Default</PROPERTY>
    <PROPERTY name="read-ahead-size-numeric" type="string">-1</PROPERTY>
    <PROPERTY name="volume-type" type="string">master volume</PROPERTY>
    <PROPERTY name="volume-type-numeric" type="string">2</PROPERTY>
    <PROPERTY name="volume-class" type="string">PTSNAP</PROPERTY>
    <PROPERTY name="volume-class-numeric" type="string">1</PROPERTY>
    <PROPERTY name="volume-qualifier" type="string">RSR</PROPERTY>
    <PROPERTY name="volume-qualifier-numeric" type="string">2</PROPERTY>
    <PROPERTY name="blocks" blocksize="512" type="uint64">195312384</PROPERTY>
    <PROPERTY name="capabilities" type="string">dmscr</PROPERTY>
    <PROPERTY name="volume-parent" type="string"></PROPERTY>
    <PROPERTY name="snap-pool" type="string">SN</PROPERTY>
    <PROPERTY name="replication-set" type="string">SN</PROPERTY>
    <PROPERTY name="attributes" type="string">xs</PROPERTY>
    <PROPERTY name="virtual-disk-serial" type="string">SN</PROPERTY>
    <PROPERTY name="volume-description" type="string"></PROPERTY>
    <PROPERTY name="wwn" type="string">600C0FF00010E1A124253A4F01000000</PROPERTY>
    <PROPERTY name="progress" type="string">0%</PROPERTY>
    <PROPERTY name="progress-numeric" type="string">0</PROPERTY>
    <PROPERTY name="container-name" type="string">RSR1A</PROPERTY>
    <PROPERTY name="container-serial" type="string">SN</PROPERTY>
    <PROPERTY name="health" type="string">OK</PROPERTY>
    <PROPERTY name="health-numeric" type="string">0</PROPERTY>
    <PROPERTY name="health-reason" type="string"></PROPERTY>
    <PROPERTY name="health-recommendation" type="string"></PROPERTY>
  </OBJECT>
...
```

See also

- volume-names

volume-statistics

Properties

Table 96 volume-statistics properties

Name	Type	Description
volume-name	string	Volume name.
serial-number	string	Volume serial number.
bytes-per-second	string	Data transfer rate calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
bytes-per-second-numeric	string	Unformatted bytes-per-second value.
iops	uint32	Input/output operations per second, calculated over the interval since these statistics were last requested or reset. This value will be zero if it has not been requested or reset since a controller restart.
number-of-reads	uint64	Number of read operations since these statistics were last reset or since the controller was restarted.
number-of-writes	uint64	Number of write operations since these statistics were last reset or since the controller was restarted.
data-read	string	Amount of data read since these statistics were last reset or since the controller was restarted.
data-read-numeric	string	Unformatted data-read value.
data-written	string	Amount of data written since these statistics were last reset or since the controller was restarted.
data-written-numeric	string	Unformatted data-written value.
write-cache-hits	uint64	For the controller that owns the volume, the number of times the block written to is found in cache.
write-cache-misses	uint64	For the controller that owns the volume, the number of times the block written to is not found in cache.
read-cache-hits	uint64	For the controller that owns the volume, the number of times the block to be read is found in cache.
read-cache-misses	uint64	For the controller that owns the volume, the number of times the block to be read is not found in cache.
small-destages	uint64	Number of times flush from cache to disk is not a full stripe.
full-stripe-write-destages	uint64	Number of times flush from cache to disk is a full stripe.
read-ahead-operations	uint64	Number of read pre-fetch or anticipatory-read operations.
write-cache-space	uint16	Cache size used on behalf of this volume.
write-cache-percent	uint32	Percentage of cache used on behalf of this volume.
reset-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when these statistics were last reset, either by a user or by a controller restart.
reset-time-numeric	string	Unformatted reset-time value.

Table 96 volume-statistics properties (continued)

Name	Type	Description
start-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling started for the iops and bytes-per-second values.
start-sample-time-numeric	string	Unformatted start-sample-time value.
stop-sample-time	string	Date and time, in the format *year-month-day hour:minutes:seconds*, when sampling stopped for the iops and bytes-per-second values.
stop-sample-time-numeric	string	Unformatted stop-sample-time value.

Example

```
# show volume-statistics
...
  <OBJECT basetype="volume-statistics" name="volume-statistics" oid="1" format="rows">
    <PROPERTY name="volume-name" type="string">RSR1AVol1</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="bytes-per-second" units="KB" type="string">380.9KB</PROPERTY>
    <PROPERTY name="bytes-per-second-numeric" type="string">380928</PROPERTY>
    <PROPERTY name="iops" type="uint32">1</PROPERTY>
    <PROPERTY name="number-of-reads" type="uint64">383073</PROPERTY>
    <PROPERTY name="number-of-writes" type="uint64">14256</PROPERTY>
    <PROPERTY name="data-read" units="GB" type="string">100.0GB</PROPERTY>
    <PROPERTY name="data-read-numeric" type="string">100003655168</PROPERTY>
    <PROPERTY name="data-written" units="MB" type="string">1709.6MB</PROPERTY>
    <PROPERTY name="data-written-numeric" type="string">1709649920</PROPERTY>
    <PROPERTY name="write-cache-hits" type="uint64">12228</PROPERTY>
    <PROPERTY name="write-cache-misses" type="uint64">105469</PROPERTY>
    <PROPERTY name="read-cache-hits" type="uint64">6775</PROPERTY>
    <PROPERTY name="read-cache-misses" type="uint64">6097687</PROPERTY>
    <PROPERTY name="small-destages" type="uint64">1511</PROPERTY>
    <PROPERTY name="full-stripe-write-destages" type="uint64">12992</PROPERTY>
    <PROPERTY name="read-ahead-operations" type="uint64">380397</PROPERTY>
    <PROPERTY name="write-cache-space" type="uint16">0</PROPERTY>
    <PROPERTY name="write-cache-percent" type="uint32">0</PROPERTY>
    <PROPERTY name="reset-time" type="string">2012-02-13 12:45:31</PROPERTY>
    <PROPERTY name="reset-time-numeric" type="string">1329137131</PROPERTY>
    <PROPERTY name="start-sample-time" type="string">2012-02-24 12:47:34</PROPERTY>
    <PROPERTY name="start-sample-time-numeric" type="string">1330087654</PROPERTY>
    <PROPERTY name="stop-sample-time" type="string">2012-02-29 10:19:57</PROPERTY>
    <PROPERTY name="stop-sample-time-numeric" type="string">1330510797</PROPERTY>
  </OBJECT>
...
```

volume-view

Properties

Table 97 volume-view properties

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

Example

```
# show volume-maps
...
  <OBJECT basetype="volume-view" name="volume-view" oid="1" format="labeled">
    <PROPERTY name="volume-serial" key="true" type="string">SN</PROPERTY>
    <PROPERTY name="volume-name" type="string">vd01_v001</PROPERTY>
    ...
  </OBJECT>
...
```

Embedded basetypes

- volume-view-mappings

volume-view-mappings

Properties

Table 98 volume-view-mappings properties

Name	Type	Description
ports	string	• Controller host ports that the mapping applies to. • Blank if not mapped or mapped as no-access.
lun	string	• LUN that identifies the volume to a host. • Blank if not mapped or mapped as no-access.
access	string	Type of host access to the volume. • read-write: The host has read and write access to the volume. This is the default. • 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.
port-wwn	string	• For an FC or SAS host port, the host WWPN. • For an iSCSI host port, the host initiator node name (typically the IQN). • For any host that is not explicitly mapped, all other hosts.
nickname	string	• Host nickname. • Blank if not set or for all other hosts.
host-profile	string	• Standard: The host allows LUN 0 to be assigned to a mapping.

Example

```
# show volume-maps
...
    <OBJECT basetype="volume-view-mappings" name="host-view" oid="2" format="rows">
      <PROPERTY name="ports" type="string">A1,A2,B1,B2</PROPERTY>
      <PROPERTY name="lun" type="string">1</PROPERTY>
      <PROPERTY name="access" type="string">read-write</PROPERTY>
      <PROPERTY name="port-wwn" type="string">IQN</PROPERTY>
      <PROPERTY name="nickname" type="string">test1_iSCSI</PROPERTY>
      <PROPERTY name="host-profile" type="string">Standard</PROPERTY>
    </OBJECT>
...
```

A Settings changed by restore defaults

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

Table 99 Settings changed by restore defaults

Setting	Value
System information settings: • System name • System contact • System location • System information	 • `Uninitialized Name` • `Uninitialized Contact` • `Uninitialized Location` • `Uninitialized Info`
Management protocols settings: • CLI/Telnet • CLI/SSH • FTP • SNMP • WBI/HTTP • WBI/HTTPS • SMI-S • Unsecure SMI-S • Debug • In-band SES	 • `Enabled` • `Enabled` • `Enabled` • `Enabled` • `Enabled` • `Enabled` • `Enabled` • Disabled • `Disabled` • `Enabled`
Users	All configured users are deleted and replaced with default user definitions and default settings: • User: `manage`; password: `!manage` • User: `monitor`; password: `!monitor` • User: `ftp`; password: `!ftp` • Temperature scale: `Celsius` • Timeout: 30 minutes
CLI/Telnet timeout	30 minutes
Tasks and schedules	(preserved)[1]
Remote system definitions	(preserved)[2]
MC debug logs	(preserved)[3]
SC event logs	(preserved)
Time/date and NTP settings	(preserved)[4]
Network IP settings	(preserved)[5]
Network Ethernet-switch settings • Link speed • Duplex mode • Auto-negotiation	 • `100mbps` • `Full` • `Enabled`
SNMP settings: • SNMP • SNMP trap notification level • SNMP trap host IPs • SNMP read community • SNMP write community	 • `Disabled` • `none` • `0.0.0.0` • `public` • `private`

Table 99 Settings changed by restore defaults (continued)

Setting	Value
SMTP settings: • Email notification • Email notify filter • Email addresses • Email server • Email domain • Email sender • Log destination • Include logs	 • `Disabled` • (none) • (none) • (none) • (none) • (none) • (none) • `Disabled`
SSL/SSH certificates	(preserved)[6]
Licenses	(preserved)
Vdisk metadata	(preserved)
Host port settings: • FC link speed • FC topology (3XX0 models) • FC topology (3XX3 models)	 • `Auto` • `Auto` • `Point-to-Point`
Host names	(preserved)[7]
Drive spin down	`Disabled`
Advanced settings: • Vdisk background scrub • Partner firmware upgrade • Utility priority • SMART • Dynamic spare configuration • Enclosure polling rate • Supercap failure • CompactFlash failure • Auto write back • Disk background scrub	 • `Disabled` • `Enabled` • `High` • (preserved)[8] • `Disabled` • 5 seconds • `Enabled` • `Enabled` • `Enabled` • `Disabled`
Native Command Queuing (NCQ)	Enabled
Managed Logs	`Disabled`

1. Factory default: no tasks or schedules.
2. Factory default: no remote system definitions.
3. Factory default: MC logs are cleared.
4. Factory default: NTP is disabled; NTP host IP address is 0.0.0.0; NTP offset is 0.
5. Factory default: IP address mode is manual; controller A IP is 10.0.0.2; controller B IP is 10.0.0.3; subnet mask is 255.255.255.0; gateway IP is 10.0.0.1.
6. Factory default: certificates are initialized.
7. Factory default: host names are cleared.
8. Factory default: no action for all disks.

Glossary

CAPI	Configuration Application Programming Interface. The proprietary protocol used for communication between the Storage Controller and the Management Controller in a controller module. CAPI is always enabled.
CHAP	Challenge-Handshake Authentication Protocol.
chunk size	The amount of contiguous data that is written to a vdisk member before moving to the next member of the vdisk.
compatible disk	A disk that has enough capacity to replace a failed disk and is the same type (SAS or SATA).
dedicated spare	A disk that is reserved for use by a specific vdisk to replace a failed disk. See compatible disk.
default mapping	Host-access settings that are configured when a volume is created, and that apply to all hosts that are not explicitly mapped to that volume using different settings. See also explicit mapping and masking.
drive spin down (DSD)	A power-saving feature that monitors disk activity in the storage system and spins down inactive SAS and SATA disks, based on user-selectable policies.
DRM	Disaster recovery management. Storage-system firmware features that, when the Site Replication Adapter (SRA) feature is enabled, support the use of VMware's Site Recovery Manager to automate disaster-recovery failover and failback tasks. See also SRA.
dual-port disk	A disk that is connected to both controllers so its data path is fault-tolerant.
dynamic spare	An available compatible disk that is automatically assigned, if the dynamic spares option is enabled, to replace a failed disk in a redundant vdisk. See compatible disk.
EC	Expander Controller. The processor (located in the SAS expander in each controller module and expansion module) that controls the SAS expander and provides SES functionality. See also EMP.
EMP	Enclosure management processor. An EC subsystem that provides SES data such as temperature, power supply and fan status, and the presence or absence of disks.
explicit mapping	Access settings for a host to a volume that override the volume's default mapping. See also default mapping and masking.
FC	Fibre Channel interface protocol.
FRU	Field-replaceable unit.
global spare	A disk that is reserved for use by any redundant vdisk to replace a failed disk. See compatible disk.
host	An external port that the storage system is attached to. The external port may be a port in an I/O adapter in a server, or a port in a network switch.
image ID	A globally unique serial number that identifies the point-in-time image source for a volume. All volumes that have identical image IDs have identical data content, whether they be snapshots or stand-alone volumes.
IOM	Input/output module, which can be either a controller module or an expansion module.
IQN	iSCSI Qualified Name.
iSCSI	Internet SCSI interface protocol.
iSNS	Internet Storage Name Service.
jumbo frame	In an iSCSI network, a frame that can contain 9000 bytes for large data transfers. A normal frame can contain 1500 bytes.
leftover	The state of a disk that has been automatically excluded from a vdisk, and is no longer needed by the vdisk after the vdisk is reconstructed.
loop	Fibre Channel Arbitrated Loop (FC-AL) topology.

masking	Volume-mapping settings that specify no access to that volume by hosts. See also default mapping and explicit mapping.
master volume	A volume that is enabled for snapshots and has an associated snap pool.
MC	Management Controller. The processor (located in a controller module) that is responsible for human-computer interface and computer-computer interface functions, and interacts with the SC.
metadata	Data in the first sectors of a disk drive that stores all disk, vdisk, and volume specific information including vdisk membership or spare identification, vdisk ownership, volumes and snapshots in the vdisk, host mapping of volumes, and results of the last media scrub.
network port	The Ethernet port on a controller module through which its Management Controller is connected to the network.
point-to-point	Fibre Channel Point-to-Point topology.
primary volume	The volume that is the source of data in a replication set and that can be mapped to hosts. For disaster recovery purposes, if the primary volume goes offline, a secondary volume can be designated as the primary volume. The primary volume exists in a primary vdisk in the primary (or local) storage system.
proxy volume	A virtual volume in the local system that represents a volume in a remote system. Proxy volumes are used internally by the controllers to perform actions such as transferring replication data.
remote replication	Asynchronous (batch) replication of block-level data from a volume in a primary system to a volume in one or more secondary systems by creating a replication snapshot of the primary volume and copying the snapshot data to the secondary systems via Fibre Channel or iSCSI links. The capability to perform remote replication is a licensed feature (AssuredRemote).
replication image	A conceptual term for replication snapshots that have the same image ID in primary and secondary systems. These synchronized snapshots contain identical data and can be used for disaster recovery.
replication set	Associated primary and secondary volumes that are enabled for replication and that typically reside in two physically or geographically separate storage systems. See primary volume and secondary volume.
replication snapshot	A special type of snapshot, created by the remote replication feature, that preserves the state of data of a replication set's primary volume as it existed when the snapshot was created. For a primary volume, the replication process creates a replication snapshot on both the primary system and, when the replication of primary-volume data to the secondary volume is complete, on the secondary system. Replication snapshots are unmappable and are not counted toward a license limit, although they are counted toward the system's maximum number of volumes. A replication snapshot can be exported to a regular, licensed snapshot. See also replication sync point.
replication sync point	The state of a replication snapshot whose corresponding primary or secondary snapshot exists and contains identical data. For a replication set, four types of sync point are identified: the only replication snapshot that is copy-complete on any secondary system is the “only sync point”; the latest replication snapshot that is copy-complete on any secondary system is the “current sync point”; the latest replication snapshot that is copy-complete on all secondary systems is the “common sync point”; a common sync point that has been superseded by a new common sync point is an “old common sync point.”
SAS	Serial Attached SCSI interface protocol or disk-drive architecture.
SATA	Serial ATA disk-drive architecture.
SC	Storage Controller. The processor (located in a controller module) that is responsible for RAID controller functions. The SC is also referred to as the RAID controller.

secondary volume The volume that is the destination for data in a replication set and that is not accessible to hosts. For disaster recovery purposes, if the primary volume goes offline, a secondary volume can be designated as the primary volume. The secondary volume exists in a secondary vdisk in a secondary (or remote) storage system.

The contents of a secondary volume are in a constant state of flux and are not in a consistent state while a replication is in process. Only snapshots that are associated with a secondary volume are data consistent.

secret For use with CHAP, a password that is shared between an initiator and a target to enable authentication.

SES SCSI Enclosure Services.

single-port disk A disk that is connected to both controllers so its data path is not fault-tolerant. Single-port disk types are identified with the suffix -S.

snap pool A volume that stores data that is specific to snapshots of an associated master volume, including copy-on-write data and data written explicitly to the snapshots. A snap pool cannot be mapped.

snapshot A "virtual" volume that preserves the state of a master volume's data as it existed when the snapshot was created. Data associated with a snapshot is recorded in both the master volume and in its associated snap pool. A snapshot can be mapped and written to. The capability to create snapshots is a licensed feature (AssuredSnap). Snapshots that can be mapped to hosts are counted against the snapshot-license limit, whereas transient and unmappable snapshots are not.

SRA Storage Replication Adapter. A host-based software component that allows VMware's Site Recovery Manager to manage the storage-system firmware's disaster recovery management (DRM) features, automating disaster-recovery failover and failback tasks. The SRA uses the CLI XML API to control the storage system. See also DRM.

SSD Solid-state drive.

ULP Unified LUN Presentation. A RAID controller feature that enables a host to access mapped volumes through any controller host port. ULP incorporates Asymmetric Logical Unit Access (ALUA) extensions.

unwritable cache data Cache data that has not been written to disk and 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.

vdisk A "virtual" disk comprising the capacity of one or more disks. The number of disks that a vdisk can contain is determined by its RAID level.

volume A portion of the capacity of a vdisk that can be presented as a storage device to a host.

volume copy An independent copy of the data in a volume. The capability to create volume copies is a licensed feature (AssuredCopy) that makes use of snapshot functionality.

WWN World Wide Name. A globally unique 64-bit number that identifies a node process or node port.

WWNN World Wide Node Name. A globally unique 64-bit number that identifies a node process.

WWPN World Wide Port Name. A globally unique 64-bit number that identifies a node port.

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