



RPC-693xx Series CLI Reference Guide

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Adobe PostScript

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Preface

This guide provides information about managing a Phoenix RPC12 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

In addition to this guide, please refer to other documents for this product:

- The Installation document for your product model
- Phoenix RPC12 Series Setup Guide
- Phoenix RPC12 Series RAIDar User Guide
- Phoenix RPC12 Series FRU Installation and Replacement Guide
- Phoenix Event Descriptions Reference Guide
- Phoenix Installing Optional Software for Microsoft Windows® Server

Document conventions and symbols

Table 1 Document conventions

Convention	Element
Navy blue text	Cross-reference links and e-mail addresses
Navy blue 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
<i>Italics font</i>	Text emphasis
Monospace font	• File and directory names • System output • Code • Text typed at the command-line
<i>Monospace, italic font</i>	• 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.

1 Using the CLI

This chapter introduces the Phoenix RPC12 Series command-line interface (CLI).

Accessing the CLI

The CLI software embedded in controller modules enables you to manage a storage system out of band. You can access the CLI in two ways:

- By using 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 modes

The CLI has two output modes:

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

Console mode enables users to interact with the CLI and obtain easily readable information. This mode 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.

API mode uses XML format and 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 mode because labels, field sizes, and order of fields may change in future firmware releases. To properly script using the CLI, use API mode. API mode 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 mode by using the `set cli-parameters` command; see [Example](#) on page 121.

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  State      Type  Size
Rate(Gb/s)  SP Status
-----
0.2          SN           Up      vendor  rev  AVAIL      SAS   146.8GB
3.0
-----
# exit
```

Using CLI scripts

CLI commands can be scripted using a Telnet client like Expect or a Perl library. The following example shows how to construct a script using a Perl library for Telnet communication.

```
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 = $telnet->waitfor(/(login|username) /i);
    if ($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);
}
```

The above shows a Perl script for logging in. `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.

For scripting support, change the CLI output mode from the default, `console`, which produces human-readable output, to `api` or `api-embed`, which produce XML output.

In the following command, the first argument enables API mode to allow easier parsing. The second argument disables the paging mode that pauses for each full screen of command output.

```
$telnet->cmd("set cli-parameters api 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 ]");  
}
```

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

Using the XML API

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. By obtaining the latest DTD for validation, the parser will be forward compatible.

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: • <code>basetype</code>. 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.). • <code>name</code>. The name of the object. • <code>oid</code>. 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: • <code>name</code>. The unique name for the property within the object. • <code>key</code>. Indicates whether this property is a key value to identify this object. • <code>type</code>. The type of data represented by the element data. • <code>size</code>. Typically the maximum size of the output. Usually only important if the console output is displayed in rows. • <code>draw</code>. Whether to show or hide this data in console format. • <code>sort</code>. The type of sorting that can be applied to this property. • <code>display-name</code>. The label for this data to show in user interfaces.

Table 3 XML API elements (continued)

Element	Description and attributes
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 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">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="int32" 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

This section provides example output from the XML API.

The XML API is available through the CLI interface, which can be accessed via Telnet or SSH. The command input is in standard CLI format as defined in this guide. The output is in XML which conforms to the DTD described in [XML API DTD content](#).

The recommended command to enable XML API mode is `set cli-parameters api pager off`, which displays output without pausing after each screenful of data. The following example shows how output of the `show volumes` command appears in XML API mode:

```
# show volumes
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<RESPONSE VERSION="L100">
  <OBJECT basetype="volumes" name="volume" oid="1" format="rows">
    <PROPERTY name="virtual-disk-name" type="string" size="21" draw="true"
sort="string" display-name="Vdisk Name">vd1</PROPERTY>
    <PROPERTY name="volume-name" type="string" size="21" draw="true"
sort="string" display-name="Name">vd1_v0</PROPERTY>
    <PROPERTY name="size" units="GB" type="uint64_t" size="16" draw="true"
sort="size" display-name="Size">35.9GB</PROPERTY>
    <PROPERTY name="size-numeric" type="uint64_t" size="16" draw="true"
sort="size" display-name="Volumes">70312480</PROPERTY>
    <PROPERTY name="preferred-owner" type="enumeration" size="4" draw="true"
sort="string" display-name="Preferred Owner">A</PROPERTY>
    <PROPERTY name="preferred-owner-numeric" type="enumeration" size="4"
draw="true" sort="string" display-name="Volumes">1</PROPERTY>
    <PROPERTY name="owner" type="enumeration" size="3" draw="true" sort="string"
display-name="Current Owner">A</PROPERTY>
    <PROPERTY name="owner-numeric" type="enumeration" size="3" draw="true"
sort="string" display-name="Volumes">1</PROPERTY>
    <PROPERTY name="serial-number" key="true" type="string" size="33" draw="true"
sort="string" display-name="Serial
Number">00c0ffa000010000f9f99a4801000000</PROPERTY>
    <PROPERTY name="write-policy" type="enumeration" size="13" draw="true"
sort="string" display-name="Cache Write Policy">write-back</PROPERTY>
    <PROPERTY name="write-policy-numeric" type="enumeration" size="13"
draw="true" sort="string" display-name="Volumes">1</PROPERTY>
    <PROPERTY name="cache-optimization" type="enumeration" size="12" draw="true"
sort="string" display-name="Cache Optimization">standard</PROPERTY>
    <PROPERTY name="cache-optimization-numeric" type="enumeration" size="12"
draw="true" sort="string" display-name="Volumes">0</PROPERTY>
    <PROPERTY name="read-ahead-size" type="enumeration" size="16" draw="true"
sort="string" display-name="Read Ahead Size">Default</PROPERTY>
    <PROPERTY name="read-ahead-size-numeric" type="enumeration" size="16"
draw="true" sort="string" display-name="Volumes">-1</PROPERTY>
    <PROPERTY name="volume-type" type="enumeration" size="12" draw="true"
sort="string" display-name="Type">standard</PROPERTY>
    <PROPERTY name="volume-type-numeric" type="enumeration" size="12" draw="true"
sort="string" display-name="Volumes">0</PROPERTY>
    <PROPERTY name="volume-class" type="enumeration" size="8" draw="false"
sort="string" display-name="Class">standard</PROPERTY>
    <PROPERTY name="volume-class-numeric" type="enumeration" size="8"
draw="false" sort="string" display-name="Volumes">0</PROPERTY>
    <PROPERTY name="volume-qualifier" type="enumeration" size="8" draw="false"
sort="string" display-name="Qualifier">N/A</PROPERTY>
    <PROPERTY name="volume-qualifier-numeric" type="enumeration" size="8"
draw="false" sort="string" display-name="Volumes">0</PROPERTY>
    <PROPERTY name="blocks" blocksize="512" type="uint64" size="32" draw="false"
sort="integer" display-name="Blocks">70312480</PROPERTY>
    <PROPERTY name="capabilities" type="string" size="15" draw="false"
sort="nosort" display-name="Volume Capabilities">dme</PROPERTY>
    <PROPERTY name="volume-parent" type="string" size="32" draw="false"
sort="string" display-name="Master Volume"></PROPERTY>
    <PROPERTY name="snap-pool" type="string" size="32" draw="false" sort="string"
display-name="Snap-pool"></PROPERTY>
    <PROPERTY name="replication-set" type="string" size="32" draw="false"
sort="string" display-name="Replication-Set"></PROPERTY>
    <PROPERTY name="attributes" type="string" size="15" draw="false"
sort="string" display-name="Single Pathed"></PROPERTY>
```

```

    <PROPERTY name="virtual-disk-serial" type="string" size="32" draw="false"
sort="string" display-name="Vdisk Serial
Number">00c0ffa000010000bd85994800000000</PROPERTY>
    <PROPERTY name="volume-description" type="string" size="130" draw="false"
sort="string" display-name="Volume Description"></PROPERTY>
  </OBJECT>
<OBJECT basetype="status" name="status" oid="2">
  <PROPERTY name="response-type" type="enumeration" size="12" draw="false"
sort="nosort" display-name="Response Type">Success</PROPERTY>
  <PROPERTY name="response-type-numeric" type="enumeration" size="12"
draw="false" sort="nosort" display-name="Response">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="int32" 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 12:04:21</PROPERTY>
  <PROPERTY name="time-stamp-numeric" type="uint32" size="25" draw="false"
sort="datetime" display-name="Time">1281441861</PROPERTY>
</OBJECT>
</RESPONSE>

```

The following example shows XML API output from the create vdisk command:

```

# 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">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="int32" 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 DTD content

The following DTD provides the structure of all documents returned by the CLI when XML API mode is enabled. Elements and attributes are described in the table on the following page.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!DOCTYPE RESPONSE [
<!-- Copyright Protected Material 2002-2007. -->
<!-- Response Element. Echoes the request back -->
<!ELEMENT RESPONSE (ASC|COMP|OBJECT|LOG_CONTENT)*>
<!ATTLIST RESPONSE VERSION CDATA #IMPLIED request CDATA #IMPLIED>
<!-- Object Definition. Essentially the object can only contain properties. OID
is unique per object only in each request -->
<!ELEMENT OBJECT (PROPERTY|OBJECT)*>
<!ATTLIST OBJECT oid CDATA #REQUIRED name CDATA #IMPLIED basetype CDATA #IMPLIED
format (pairs|rows|packed|labeled|status) #IMPLIED >
<!-- Property definition -->
<!ELEMENT PROPERTY (#PCDATA)>
<!ATTLIST PROPERTY
    display-name CDATA #IMPLIED
    draw (true|false) #IMPLIED
    size CDATA #IMPLIED
    type (string|uint8|uint16|uint32|uint64|int8|int16|int32|int64|bool|enum)
#IMPLIED
    key (true|false) #IMPLIED
    name CDATA #REQUIRED
    units CDATA #IMPLIED
    blocksize CDATA #IMPLIED
>
<!-- Composition, P is the part component, G is the grouping component -->
<!ELEMENT COMP EMPTY>
<!ATTLIST COMP P IDREF #REQUIRED G IDREF #REQUIRED>
<!-- Simple Association, A and B are the oids of the Objects -->
<!ELEMENT ASC EMPTY>
<!ATTLIST ASC A IDREF #REQUIRED B IDREF #REQUIRED>
<!ELEMENT LOG_CONTENT (#PCDATA)>
] >
```

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. Brief mode, which is disabled by default, shows only the name and key properties of objects in normal commands. 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, embedded objects contain media-specific detail for ports, and only name and key properties are shown:

```
# 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="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">Host port is down.</PROPERTY>
    <OBJECT basetype="fc-port" name="port-details" oid="2" format="rows">
      <PROPERTY name="configured-topology">Loop</PROPERTY>
      <PROPERTY name="primary-loop-id"></PROPERTY>
    </OBJECT>
  </OBJECT>
  <OBJECT basetype="port" name="name" oid="3" format="rows">
    <PROPERTY name="durable-id">hostport_A1</PROPERTY>
    <PROPERTY name="controller" key="true">A</PROPERTY>
    <PROPERTY name="controller-numeric" key="true">1</PROPERTY>
    <PROPERTY name="port" key="true">A1</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">Host port is down.</PROPERTY>
    <OBJECT basetype="fc-port" name="port-details" oid="4" format="rows">
      <PROPERTY name="configured-topology">Loop</PROPERTY>
      <PROPERTY name="primary-loop-id"></PROPERTY>
    </OBJECT>
  </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">2010-08-10 12:11:10</PROPERTY>
    <PROPERTY name="time-stamp-numeric">1281442270</PROPERTY>
  </OBJECT>
</RESPONSE>
```

Command syntax

Keywords and parameters

Command keywords must be entered in lowercase. Parameter values can be entered in uppercase and lowercase.

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

Parameter values in italics are variables. Substitute text that is appropriate for the task you want to perform.

Unless otherwise specified, a parameter value can include any valid UTF-8 characters except backslash (\), comma, double quote ("), and control characters. A parameter value that includes a space must be enclosed in double quotes.

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.

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: vdl, "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: vdl_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** 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** will list commands or keywords that match the entered string and redisplay the string so you can complete it.

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

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

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

To	Press
Complete a partially entered keyword	Tab
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

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

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 6 Commands by category

Category	Commands	
CLI and users	<code>create user</code> <code>delete user</code> <code>exit</code> <code>help</code> (see Viewing help) <code>set cli-parameters</code>	<code>set password</code> <code>set prompt</code> <code>set user</code> <code>show cli-parameters</code> <code>show users</code>
Disks, vdisks, and spares	<code>abort scrub</code> <code>abort verify</code> <code>clear disk-metadata</code> <code>create vdisk</code> <code>delete vdisks</code> <code>dequarantine</code> <code>expand vdisk</code> <code>rescan</code> <code>scrub vdisk</code>	<code>set expander-fault-isolation</code> <code>set led</code> <code>set spares</code> <code>set vdisk</code> <code>show disks</code> <code>show vdisks</code> <code>trust</code> <code>verify vdisk</code>
Volumes, hosts, and mapping	<code>create host</code> <code>create volume</code> <code>create volume-set</code> <code>delete host</code> <code>delete volumes</code> <code>expand volume</code> <code>map volume</code> <code>set cache-parameters</code> <code>set host-name</code>	<code>set volume</code> <code>show cache-parameters</code> <code>show host-maps</code> <code>show hosts</code> <code>show ports</code> <code>show volume-maps</code> <code>show volume-names</code> <code>show volumes</code> <code>unmap volume</code>
Snapshots	<code>convert master-to-std</code> <code>convert std-to-master</code> <code>create master-volume</code> <code>create snap-pool</code> <code>create snapshots</code> <code>delete all-master-volumes</code> <code>delete all-snapshots</code> <code>delete master-volume</code> <code>delete snap-pool</code> <code>delete snapshot</code> <code>delete snapshot-write-data</code>	<code>expand snap-pool</code> <code>reset snapshot</code> <code>rollback master-volume</code> <code>set priorities</code> <code>set snap-pool-policy</code> <code>set snap-pool-threshold</code> <code>show master-volumes</code> <code>show priorities</code> <code>show snap-pools</code> <code>show snapshots</code>

Table 6 Commands by category (continued)

Category	Commands	
Volume copy	abort volumecopy create volume-copy	show volumecopy-status volumecopy
Scheduled tasks	create schedule create task delete schedule delete task set schedule	set task show schedule-details show schedules show task-details show tasks
Event notification	set email-parameters set snmp-parameters show email-parameters	show events show snmp-parameters test
System configuration and utilities	clear cache create chap-record delete chap-records ping reset host-link restart set auto-write-through-trigger set awt set chap-record set controller-date set disk-parameters set enclosure set expander-fault-isolation set expander-phy set host-parameters set iscsi-parameters set job-parameters set led set network-parameters set ntp-parameters set protocols set system show auto-write-through-trigger show awt show chap-records show configuration	show controller-date show controllers show disk-parameters show enclosures show enclosure-status show expander-status show frus show host-parameters show inquiry show iscsi-parameters show job-parameters show license show network-parameters show ntp-status show ports show power-supplies show protocols show redundancy-mode show sas-link-health show sensor-status show shutdown-status show system show system-parameters show versions shutdown versions

Table 6 Commands by category (continued)

Category	Commands	
Service utilities	clear events clear expander-status restore defaults set debug-log-parameters	set expander-fault-isolation set expander-phy show debug-log-parameters show expander-status
API specific	meta set advanced-settings	show advanced-settings show refresh-counters
Remote systems	create remote-system delete remote-system remote	set remote-system show remote-systems verify remote-link
Remote replication	abort replication add replication-volume create replication-set delete replication-set detach replication-volume export snapshot reattach replication-volume remove replication-volume replicate snapshot replicate volume	resume replication set replication-primary-volume set replication-volume-parameters show replication-images show replication-sets show replication-volumes start vdisk stop vdisk suspend replication
Statistics	reset controller-statistics reset disk-error-statistics reset vdisk-statistics reset volume-statistics show controller-statistics	show disk-statistics show host-port-statistics show vdisk-statistics show volume-statistics

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

Table 7 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
show drive-parameters	show disk-parameters
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 For `show` commands only, descriptions of output fields

Examples One or more examples of the command's usage, if the command has parameters or detailed output

See also Cross-references to commands that are used with the command

abort replication

Description Aborts the current replication operation on the specified replication 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 replication volume. If the name is not unique across replication sets, specify the set parameter.

Example Abort replication on replication volume MV1:

```
# abort replication MV1
Success: Replication Aborted.
```

See also • `resume replication`
 • `suspend replication`
 • `show replication-sets`
 • `show replication-volumes`

abort scrub

Description Aborts the scrub vdisk operation for specified vdisks.

Syntax abort scrub vdisk *vdisk*s

Parameters vdisk *vdisk*s

Names or serial numbers of the vdisks to stop scrubbing. For vdisk syntax, see [Command syntax](#) on page 19.

Example Abort scrubbing vdisk vd1:

```
# abort scrub vdisk vd1
Info: Scrub was aborted on vdisk vd1.
```

See also • [scrub vdisk](#)
• [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 19.

Example Abort verifying vdisk `vd1`:

```
# abort verify vdisk vd1
```

```
Info: Command completed successfully. (vd1) - The verify was aborted on vdisk  
vd1.
```

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 19.

Example Abort creating destination volume vd1_copy:

```
# abort volumecopy v1_copy
Success: Command completed successfully. - The volume copy was aborted.
```

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. The IP address can include a port number; for example, 10.134.2.1:3260.

`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: Verifying that the secondary volume was added to the replication set. This may take a couple of minutes...

Info: Command completed successfully. (MV2) - Started adding the secondary volume to the replication set.

Info: Command completed successfully. (MV2) - Added secondary volume MV2.

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 19. 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 - Unwritable cache data has been cleared.
```

clear disk-metadata

Description Clears metadata from “leftover” disks. Each disk contains metadata that the system uses to identify the disk's owning vdisk, if any. If the system cannot locate the vdisk, as when the disk has been moved to a different system, the owning vdisk is shown as Leftover. A leftover disk's Power/Activity/Fault LED is illuminated amber. You must clear the metadata before you can use the disk in a different vdisk or as a spare.

If you specify a disk that is not a leftover, the command will not clear that disk's metadata.

Syntax `clear disk-metadata disks`

Parameters *disks*

IDs of the disks to clear metadata from. For disk syntax, see [Command syntax](#) on page 19.

Example Clear metadata for the first enclosure's first disk, which is *not* part of a vdisk:

```
# clear disk-metadata 0.0
Updating disk list...
Info: Command completed successfully. - Disk 0.0 metadata was cleared.
Success: Command completed successfully. - Metadata was cleared.
```

Clear metadata for disk 0.3, which is part of a vdisk:

```
# clear disk-metadata 0.3
Error: The specified disk is not a leftover disk. - Disk 0.3 metadata was NOT
cleared.
Error: The specified disk is not a leftover disk. (0.3) - Metadata was not
cleared for one or more disks.
```

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. - Event log was successfully cleared.
```

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.
```

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 19.

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

```
# convert master-to-std MV1
```

```
Success: Command completed successfully. - The conversion of a master volume to a standard volume completed.
```

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 19.

`standard-volume`

Name or serial number of the standard volume to convert. For volume syntax, see [Command syntax](#) on page 19.

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. - The conversion of a standard volume to  
a master volume completed.
```

See also • [show volumes](#)

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.

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 the originator's IQN. 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 the recipient's IQN. 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. - A CHAP record was created.
```

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, 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.
```

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.
```

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 19.

`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 19. If this parameter is omitted, the system automatically creates a snap pool that is either 20% of the master volume's size or the minimum snap-pool size, 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 the minimum snap-pool size, whichever is larger. Use either this parameter or the `snap-pool` parameter.

`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, 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
```

```
Success: Command completed successfully. (MV1) - The master volume was created.
```

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
```

Success: Command completed successfully. (MV2) - The master volume was created.

- 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. The password is displayed in clear text.

`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.
```

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 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`.

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.

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 mode; required in API mode. 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. The IP address can include a port number; for example, 10.134.2.1:3260.

`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 another system, this parameter is valid if the MCs can communicate and the `remote-system` parameter is specified. 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 another system, this parameter is valid if the MCs can communicate and the `remote-system` parameter is specified.

`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 the minimum snap-pool size, whichever is larger.

`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, 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, 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: Snap pool spData was created for volume Data.
Info: Verifying that the secondary volume was added, this may take a couple of
minutes...
Info: Command completed successfully. (Data) - Converted the volume to a master
volume.
Info: Command completed successfully. (rData) - Secondary volume created.
Info: Command completed successfully. (Data) - The primary volume prepared for
replication.
Info: Command completed successfully. (rData) - Started adding the secondary
volume.
Info: Command completed successfully. (rData) - Added secondary volume.
Success: Command completed successfully. (Data) - The primary volume is ready for
replication.
```

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 remote replication-prepared volume MV2:

```
# create replication-set primary-address wwpn=207000c0ffd52c31,217000c0ffd52c31
remote-volume MV2 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 remote replication-prepared volume MV2:

```
# create replication-set link-type iSCSI primary-address ip=10.134.9.1
remote-volume MV2 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 four volumes to start replicating at the same time, and for those replications to recur no less than 30 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 when the task will first run.
- [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.
- [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, 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, 2009; runs daily between midnight and 1:00 AM; and runs for the last time in the morning of January 1, 2010:

```
# create schedule schedule-specification "start 2009-03-01 00:01, every 1 days,
between 12:00 AM and 1:00 AM, expires 2010-01-01 1:00 AM" task-name Task1 Sched1
Success: Command completed successfully. (Sched1) - The schedule was created.
```

Create schedule Sched2 that runs Task2 for the first time on March 1, 2009, and on the first weekday of each month, with no expiration:

```
# create schedule schedule-specification "start 2009-03-01 00:01 only first
weekday of month" task-name Task2 Sched2
Success: Command completed successfully. (Sched2) - The schedule was created.
```


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

```
# create schedule schedule-specification "start 2010-01-14 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.
```

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 19.

`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. The minimum size is 10 GB/GiB.

`name`

A name for the new snap pool. The name is case sensitive, cannot include a comma, double quote, 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 snap pool SP1 on vdisk VD1:

```
# create snap-pool vdisk VD1 size 20GB SP1
Success: Command completed successfully. (SP1) - The snap-pool was created.
```

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 the minimum snap-pool size, whichever is larger. Before creating or scheduling snapshots, verify that the vdisk has enough free space to contain the snap pool.

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 19.

`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, 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: Snap pool spV1 was created.
Success: Command completed successfully. (V1snap,V2snap) - Snapshot(s) were created.
```

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 disk spin-down.

 **NOTE:** 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 the minimum snap-pool size, 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 to a host operating system, the snapshot must be unmounted before the reset is performed; leaving it mounted can cause data corruption. You should create a scheduled job on the host to unmount the snapshot prior to resetting the snapshot.

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 | EnabledDSD | DisabledDSD

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.
- EnabledDSD: Enables spin-down for all vdisks. You can use this to enable or resume disk spin-down during hours of infrequent activity.
- DisabledDSD: Disables spin-down for all vdisks. You can use this to disable or suspend disk 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 19.

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 19.

dest-vdisk *vdisk*

Name or serial number of the destination vdisk for the volume copy. For vdisk syntax, see [Command syntax](#) on page 19.

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, 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.
```

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.
```

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.
```

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.
```

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.
```

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.
```

See also

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

create user

Description Creates a user profile. The system supports 12 user profiles.

Syntax create user
[base 2|10]
[interfaces *values*]
[level monitor|manage]
[locale English|en]
[password *password*]
[precision #]
[storage-size-base 2|10]
[storage-size-precision #]
[storage-size-units auto|MB|GB|TB]
[temperature-scale celsius|c|fahrenheit|f]
[timeout #]
[type novice|standard|advanced|diagnostic]
[units auto|MB|GB|TB]
name

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.

interfaces *values*

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.
- `ftp`: File transfer protocol interface.
- `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

Optional. The display language. The default is English.

password *password*

Optional in console mode; required in API mode. Sets a new password for the user. The parameter value is case sensitive; can include a maximum of 19 bytes using characters except a backslash, double quote, or space; and is displayed in clear text. If this parameter is omitted, the command prompts you to enter and re-enter a value, which is displayed encrypted.

precision #

Optional. Sets the number of decimal places (1–10) for display of storage-space sizes. 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. Specifies to use the Celsius scale or Fahrenheit scale for temperature values. Default is Celsius.

`timeout #`

Optional. Sets the timeout value in seconds for the login session. Valid values are 120–65535. The default is 1800 seconds (30 minutes).

`type novice|standard|advanced|diagnostic`

Optional. Specifies the user's level of technical expertise. The default is `standard`. All user types have access to all commands.

`units auto|MB|GB|TB`

Optional. Sets the unit for display of storage-space sizes. `auto` lets the system determine the proper unit for a size. 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 the unit is set to TB and the precision is set to 1, the size 0.11709 TB is shown as 119.9 GB. Default is `auto`.

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, or backslash, and can have a maximum of 19 bytes. A name that includes a space must be enclosed in double quotes.

 **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.
```

See also • `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]
[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 19.

`assigned-to a|b|auto`

Optional. The controller to own the vdisk. To have the system automatically load-balance vdisks between controllers, use `auto` or omit this parameter.

`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 19.

`chunk-size 16k|32k|64k`

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). The default is 64k. For NRAID and RAID 1, `chunk-size` has no meaning and is therefore not applicable.

`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`. At the time of creation, a vdisk using offline initialization can have either one volume or none. If you want the vdisk to have more than one volume, create the vdisk with no volumes and then add volumes after initialization is complete.

`name`

A name for the new vdisk. The name is case sensitive, cannot include a comma, double quote, or backslash, and can have a maximum of 17 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. (VD1) - The vdisk was created.
```

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. (VD2) - The vdisk was created.
```

Create the RAID-0 vdisk TempData using a single-ported disk:

```
# create vdisk level raid0 disks 0.1 TempData
Info: One or more disks are Single Ported - data path will not be fault tolerant.
Success: Command completed successfully. (TempData) - The vdisk was created.
```

See also • [set vdisk](#)
• [show disks](#)
• [show vdisks](#)

create volume

Description Creates a volume in a vdisk. You can specify a size and name for the volume, and map it to hosts.

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 19.

`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`

Optional. The ports and LUN to use for all hosts that are not explicitly mapped (called the default mapping). For port syntax, see [Command syntax](#) on page 19. If this parameter is omitted, the volume is unmapped and its LUN is set to None. (You can add or remove mappings by using the `map volume` and `unmap volume` commands.)

`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. When a volume is created with no access, the volume is masked. 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. If this parameter is omitted, the default LUN is presented. You cannot use both this parameter and the mapping parameter. Use either this parameter or the prepare-replication-volume parameter.

`ports ports`

Optional. The ports through which the host can access the volume. For port syntax, see [Command syntax](#) on page 19.

`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 19.

`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 the minimum snap-pool size, whichever is larger. Use either this parameter or the snap-pool parameter.

`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. Use either this parameter or the `lun` parameter. This parameter precludes use of the `mapping`, `lun`, and `ports` parameters.

name

A name for the new volume. The name is case sensitive, cannot include a comma, double quote, 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: Command completed successfully. (V1) - The volume was created.
```

```
Success: Command completed successfully. (V1) - The volume(s) were mapped successfully.
```

See also • [set volume](#)
• [show vdisks](#)
• [show volumes](#)

create volume-copy

See [volumecopy](#).

create volume-set

Description Creates multiple volumes in the specified vdisk. The volumes will have the same base name and size. Optionally, you can specify a default mapping for the volumes; otherwise, they will be created unmapped.

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 19.

`basename` *base-name*
A base name for the new volumes. A name is case sensitive, cannot include a comma, double quote, or backslash, and can have a maximum of 20 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.

`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.

`baselun` *base-LUN*
Optional. The first in a sequence of LUNs to assign to map the volumes through specified ports. You must also specify the `ports` parameter. If the `baselun` parameter is omitted, the 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. A volume mapped with `no-access` is masked. The default is `read-write`. If this parameter is omitted, the volumes are not mapped.

`ports` *ports*
Optional. The controller ports through which hosts can access the volumes. If not all ports are specified, the unspecified ports are automatically mapped to no access. For port syntax, see [Command syntax](#) on page 19. If this parameter is omitted, the volumes are not mapped.

Example Create three 20-GB volumes with the base name `vd1_v` in vdisk `vd1`, and map them using LUN 5, 6, and 7 respectively, with read-only access through port A1:

```
# create volume-set count 3 size 20GB vdisk vd1 basename vd1_v baselun 5 access
ro ports a1
Info: Command completed successfully. (vd1_v000) - Created volume vd1_v000.
Info: Command completed successfully. (vd1_v001) - Created volume vd1_v001.
Info: Command completed successfully. (vd1_v002) - Created volume vd1_v002.
Success: Command completed successfully. - The volume(s) were mapped
successfully.
```

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 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 19.

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.
```

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 19.

`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`. This 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.
```

Delete all replication snapshots associated with master volume MV2:

```
# 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.
```

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 the originator's IQN.

all

Delete all CHAP records in the database.

Example Delete the CHAP record for a specific originator:

```
# delete chap-records name ign.1991-05.com.microsoft:myHost.domain
```

```
Success: Command completed successfully. (ign.1991-05.com.microsoft:myHost.domain) - The CHAP record was deleted.
```

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.
```

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 19.

Example Delete two global spares:

```
# delete global-spare disks 0.5,1.5
Info: Command completed successfully. (0.5) - Global spare disk 0.5 was deleted.
Info: Command completed successfully. (1.5) - Global spare disk 1.5 was deleted.
```

See also • [show disks](#)

delete host

Description Deletes a manually created host. Does not delete hosts that were discovered or are mapped. Before you can delete a manually created host that is mapped, you must unmap it. To change or remove the nickname of a manually created host, use the `set host-name` command.

Syntax `delete host host`

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

Example Delete the manually created host MyHost:

```
# delete host MyHost
Info: Command completed successfully. - Host MyHost was deleted.
```

Try to delete the mapped host Host1:

```
# delete host Host1
Error: The specified host is mapped to one or more volumes so the host was not
deleted. (Host1) - Host Host1 is mapped, so it cannot be deleted.
Error: The specified host is mapped to one or more volumes so the host was not
deleted.
```

Try to delete the discovered host 500605B000320BB4:

```
# delete host 500605B000320BB4
Error: The command had an invalid value. (257000c0ffd8b6cb) - Host
257000c0ffd8b6cb was discovered, so it cannot be deleted.
Error: The command had an invalid value.
```

See also • `set host-name`
• `show host-maps`
• `show hosts`

delete master-volume

Description Deletes a master volume. The volume's schedules 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 19.

Example Delete master volume MV1:

```
# delete master-volume MV1
Success: Command completed successfully. (MV1) - The master volume was deleted.
```

See also • [delete all-snapshots](#)
• [show master-volumes](#)

delete remote-system

Description Deletes the persistent association with a remote system.

If you delete a remote system that is a replication destination for the local system, replication will continue to work but the names of remote volumes will not be accessible; they will be shown as N/A.

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.
```

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
Success: Command completed successfully. (RS1) - Replication set deleted.
```

Delete the replication set with primary volume MV1:

```
# delete replication-set MV1
Success: Command completed successfully. (MV1) - Replication set deleted.
```

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 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.
```

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 19.

Example Delete snap pool SP1:

```
# delete snap-pool SP1
Success: Command completed successfully. (SP1) - The snap-pool was deleted.
```

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 19.

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

```
# delete snapshot delete-priority replicating-snapshot SS1
Info: Snapshot SS1 was deleted. (SS1)
```

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.
```

Force deletion of snapshot SS2:

```
# delete snapshot force SS2
Info: Snapshot SS2 was deleted. (SS2)
```

Delete three standard snapshots:

```
# delete snapshot s1,s2,s3
Info: Snapshot s1 was deleted. (s1)
Info: Snapshot s2 was deleted. (s2)
Info: Snapshot s3 was deleted. (s3)
```

See also • [delete snapshot-write-data](#)
• [show snapshots](#)

delete snapshot-write-data

Description Deletes data written to a snapshot after it was created. Deleting this modified data reverts the snapshot to the state when it was first taken.

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 19.

Example Delete only modified data from snapshot SS1:

```
# delete snapshot-write-data SS1
```

```
Success: Command completed successfully. (SS1) - Snapshot write data was deleted.
```

See also • [delete snapshot](#)
• [show snapshots](#)

delete task

Description Deletes a task. If the task is scheduled, you must delete the schedule first.

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.
```

See also • [delete schedule](#)
• [show schedule-details](#)
• [show schedules](#)
• [show task-details](#)
• [show tasks](#)

delete user

Description Deletes a user profile. You can delete any user except the default user manage.

Syntax delete user
[noprompt]
name

Parameters noprompt
Optional in console mode; required in API mode. 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.
```

Delete user Kim and suppress the confirmation prompt:

```
# delete user noprompt Kim
Success: Command completed successfully.
```

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 19.

Example Delete vdisks VD1 and VD2:

```
# delete vdisks VD1,VD2
Info: Please wait - vdisks are being deleted.
Info: Deleted vdisk VD1.
Info: Deleted vdisk VD2.
Success: Command completed successfully.
```

Delete vdisk VD3 on which a utility is running:

```
# delete vdisk VD3
The vdisk 'VD3' has jobs running. Do you want to continue? yes
Info: Please wait - vdisks are being deleted.
Info: Deleted vdisk VD3.
Success: Command completed successfully.
```

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 19.

 vdisk
 Name or serial number of the vdisk to delete the spares from. For disk syntax, see [Command syntax](#) on page 19.

Example Delete spare disk 1.5 from vdisk VD1:

```
# delete vdisk-spare disks 1.5 VD1
Info: Command completed successfully. (1.5) - Vdisk spare disk 1.5 was deleted.
```

See also • [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 19.

Example Delete volumes V1 and V2:

```
# delete volumes V1,V2
Info: Command completed successfully. (V1) - Volume V1 was deleted.
Info: Command completed successfully. (V2) - Volume V2 was deleted.
```

See also • [show volumes](#)

dequarantine

Description Removes a vdisk from quarantine.

A vdisk having a fault-tolerant RAID level becomes quarantined if at least one of its disks is missing after the storage system is powered up. Quarantine does not occur for NRAID or RAID-0 vdisks; if known-failed disks are missing; or if disks are missing after failover or recovery.

Quarantine isolates the vdisk from host access, and prevents the system from making the vdisk critical and starting reconstruction. Examples of when quarantine might occur are:

- The system is powered up and at least one disk is slow to spin up. A vdisk requiring any of these disks will be quarantined, then automatically dequarantined when all disks are ready.
- The system is powered up but one drive enclosure is not powered up. If a vdisk has disks in the missing enclosure, the vdisk becomes quarantined. When the drive enclosure is powered up, the vdisk is automatically dequarantined.
- Certain transient back-end conditions occur that require a short time to stabilize before vdisks can be used.

Quarantine status is determined by the number of missing disks:

- Quarantined offline (QTOF): The vdisk is offline and quarantined because multiple disks are missing and user data is incomplete.
- Quarantined critical (QTCR): The vdisk is offline and quarantined because at least one disk is missing; however, the vdisk could be accessed. For instance, one disk is missing from a mirror or RAID-5.
- Quarantined with down disks (QTDN): The vdisk is offline and quarantined because at least one disk is missing; however, the vdisk could be accessed and would be fault tolerant. For instance, one disk is missing from a RAID-6.

A quarantined vdisk's disks are write-locked and the vdisk is not available to hosts until the vdisk is dequarantined. A vdisk can remain quarantined indefinitely without risk of data loss.

 **NOTE:** The only commands allowed for a quarantined vdisk are `dequarantine` and `delete 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).

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

- The missing disks are found and the vdisk is automatically dequarantined.
- A vdisk with QTCR or QTDN status is automatically dequarantined after one minute. The missing disks are failed and the vdisk status changes to critical or degraded.
- The `dequarantine` command is used to manually dequarantine the vdisk. If the missing disks are later found, they are marked as leftovers.

A quarantined vdisk can be fully recovered if the missing 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 missing disks cannot be restored (for example, they failed), you can dequarantine the vdisk to restore operation in some cases. If you dequarantine a vdisk that is not missing too many disks, its status changes to critical. Then, if spares of the appropriate size are available, reconstruction begins.

If a replacement disk is missing on 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.

△ CAUTION: If the vdisk does not have enough disks to continue operation, when the vdisk is removed from quarantine it goes offline and its data cannot be recovered. To continue operation, a RAID-3 or RAID-5 vdisk can be missing one disk; a RAID-6 vdisk can be missing one or two disks; a RAID-10 or RAID-50 vdisk can be missing one disk per sub-vdisk. For example, a 16-disk RAID-10 vdisk can remain online (critical) with 8 disks missing if one disk per mirror is missing.

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 19.

Example After determining that vdisk VD1 is quarantined, remove it from quarantine and re-check its status:

```
# show vdisks
Name ... Stat ...
-----
VD1  ... QTDN ... (Quarantined with down disks)
-----

# dequarantine vdisk VD1
Success: Command completed successfully

# show vdisks
Name ... Stat ...
-----
VD1  ... FTDN ... (Fault tolerant, down)
```

See also • [show vdisks](#)

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 local system, you can perform the initial replication and then physically move the secondary volume's vdisk into a remote system.

The process to move a secondary volume is:

1. In the primary system:
 - 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.
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 drive 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. (rV1) - The replication volume has been detached.
```

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 19.

Example Expand snap pool SP1 by 100 GB:

```
# expand snap-pool size 100GB SP1
```

```
Success: Command completed successfully. - Expansion of volume SP1 was started.
```

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

△ **CAUTION:** 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, see [Command syntax](#) on page 19.

`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 19.

Example Expand vdisk VD1 to include the disk having ID 11 in the first enclosure:

```
# expand vdisk disks 0.11 VD1
Success: Command completed successfully. - Expansion was started on vdisk VD1.
```

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 19.

Example Expand standard volume V1 by 100 GB:

```
# expand volume size 100GB V1
Success: Command completed successfully. - Expansion of volume V1 was started.
```

See also

- [expand vdisk](#)
- [show vdisks](#)
- [show volumes](#)

export snapshot

Description Exports a replication snapshot on the local system to a standard snapshot. This command preserves the replication snapshot and creates a new standard snapshot on the same system.

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

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
Success: Command completed successfully. (RepSnap1) - The snapshot has been
exported.
```

See also • [show replication-sets](#)
• [show snapshots](#)

map volume

Description Maps a volume using settings that override the volume's 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.

 **IMPORTANT:** In an FC/iSCSI hybrid system, do not connect hosts or map volumes to host ports used for replication. Attempting to do so could interfere with replication operation.

 **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 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 host]`
 `volume`

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. When a volume is mapped with no-access, the volume is masked. If this parameter is omitted, access is set to read-write.

`mapping ports.LUN`
Optional. The ports and LUN to use for the mapping; any unspecified ports become unmapped. Ignored if access is set to no-access.

`lun LUN`
Optional. The LUN to use for the mapping. Ignored if access is set to no-access. If this parameter is omitted, the default LUN is presented. Do not use this parameter with the mapping parameter.

`ports ports`
Optional. The ports to use for the mapping; any unspecified ports become unmapped. Ignored if access is set to no-access. If this parameter is omitted, all ports are mapped. Use this parameter with the `lun` parameter but not with the mapping parameter.

`host host`
Optional. For FC and SAS, the host's nickname or 16-hex-digit WWPN. For iSCSI, the initiator's node name (typically the IQN) or nickname. For nickname syntax, see [Command syntax](#) on page 19. If this parameter is omitted, the mapping applies to all hosts that are not explicitly mapped.

`volume`
Name or serial number of the volume to map. For volume syntax, see [Command syntax](#) on page 19.

Example Map volume v2 with read-only access for Host1, using port A1 and LUN 100. The volume will be unmapped for all other hosts:

```
# map volume access ro mapping a1.100 host Host1 v2
Info: Command completed successfully. - Mapping succeeded. Host Host1 was mapped
for volume v2 with LUN 100.
Success: Command completed successfully. - The volume(s) were mapped
successfully.
```

Also map volume v2 with read-write access for Host2, using ports A1 and B1 and LUN 101. The volume will be unmapped for all hosts other than Host1 and Host2:

```
# map volume access rw ports a1,b1 lun 101 host Host2 v2
Info: Command completed successfully. - Mapping succeeded. Host Host2 was mapped
for volume v2 with LUN 101.
Success: Command completed successfully. - The volume(s) were mapped
successfully.
```

See also • [show host-maps](#)
• [show hosts](#)
• [show volume-maps](#)
• [show volumes](#)
• [unmap volume](#)

meta

Description In API mode, 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	port
attribute-priorities	power-supplies
auto-write-through-trigger	primary-volumes
cache-parameter	redundancy
cache-settings	refresh_counters
chap-records	remote-addresses
cli-parameters	remote-system
compact-flash	replicate-volume-tasks
controller-cache-parameters	replication-image
controller-date	replication-image-params
controllers	replication-set
controller-statistics	replication-volume
debug-log-parameters	replication-volume-summary
disk-statistics	reset-snapshot-tasks
drive-parameters	sas-port
drives	sas-status-controller-a
email-parameters	sas-status-controller-b
enclosure-components	schedules
enclosure-fru	security-communications-protocols
enclosure-fru-secrets	sensors
enclosure-list	ses
enclosures	shutdown-status
enclosure-sku	smis-info
events	snap-pools
eventsLogs	snapshot-description
expander-ports	snapshots
fan	snapshot-with-retention-tasks
fc-port	snap-tasks
fc-port-info	snmp-parameters
host-port-interconnects	status
host-port-statistics	sysinfo
hosts	system
host-view	system-parameters-table
host-view-mappings	tasks
inquiry	time-settings-table
io-modules	unhealthy-component
iscsi-parameters	users
iscsi-port	vdisk-statistics
iscsi-port-info	versions
job-parameters	virtual-disks
license	volume-copy-status
log-header-table	volume-copy-tasks
master-volumes	volume-names
mcinfo	volumes
network-parameters	volume-statistics
ntp-status	volume-view
policy-threshold	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.
```

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 primary system:
 - 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.
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.

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

Parameters `remote-address ip=IPs|wwnn=WWNNs|wwpn=WWPNs`
Optional; can be used instead of the `remote-system` parameter. Specifies host ports on the remote system where the replication 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`.

`remote-system system`
Optional; can be used instead of the `remote-address` parameter. Name or network-port IP address of the remote system where the primary volume resides. An IP address value can include a port number; for example, 10.134.11.10:3260.

`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. - The replication volume reattach has
been initiated.
```

See also • `detach replication-volume`
• `show replication-sets`
• `show replication-volumes`
• `start vdisk`
• `stop vdisk`

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 API mode 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   Serial Number
  Drive Spin Down   Spin Down Delay
-----
VD1  499.5GB 499.5GB B    B      NRAID   1      0   N/A   UP           SN
  Disabled      0
VD2  499.5GB 499.5GB A    A      NRAID   1      0   N/A   UP           SN
  Disabled      0
Data 999.1GB 886.9GB A    A      RAID0   2      0   64k   UP           SN
  Disabled      0
-----
```

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: Verifying that the destination volume was removed from the replication set.
This may take a couple of minutes...
Info: Command completed successfully. (rData) - Started removing the secondary
volume from the set.
Info: Command completed successfully. (rData) - Removed secondary volume rData.
Success: Command completed successfully. (rData) - Remove Replication volume
operation successfully completed.
```

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
Success: Replication Initiated.
```

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.

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
Success: Replication Initiated.
```

See also • `show replication-sets`
• `show replication-volumes`

rescan

Description This command forces rediscovery of attached disks and enclosures. If both Storage Controllers are online this command also reassigns enclosure IDs based on controller A's enclosure cabling order. A manual rescan may be needed after system power-up to display enclosures in the proper order.

A manual rescan is not required to detect when disks are inserted or removed; the controllers do this automatically. When disks are inserted they are detected after a short delay, which allows the disks to spin up.

When you perform a manual rescan, it temporarily pauses all I/O processes, then resumes normal operation.

Syntax `rescan`

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

```
# rescan
Success: Command completed successfully.
```

reset controller-statistics

Description Resets performance statistics for controllers, host ports, and disks.

This command resets all controller statistics except Power On Time. To reset this, restart or power cycle a controller.

This command resets basic disk statistics but not disk error statistics. To reset these, use the [reset disk-error-statistics](#) command.

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.
```

See also

- [reset disk-error-statistics](#)
- [reset vdisk-statistics](#)
- [reset volume-statistics](#)
- [show controller-statistics](#)
- [show disk-statistics](#)
- [show host-port-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 controller-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 19. 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.
```

See also

- `reset controller-statistics`
- `reset vdisk-statistics`
- `reset volume-statistics`
- `show disks`
- `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.
```

See also • [show ports](#)

reset snapshot

Description Deletes the data in a 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 the snapshot from the host operating system before performing the reset; leaving it mounted can cause data corruption.

△ **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 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 19.

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.
```

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 19. 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.
```

See also

- `reset controller-statistics`
- `reset disk-error-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 19. 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.
```

See also

- `reset controller-statistics`
- `reset disk-error-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 MC 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.

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 mode; required in API mode. 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)...
From controller A, restart the Storage Controller in controller B:

# restart sc b
Success: SC B restarted.
```

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 269. If the system contains only one controller module when the command is issued, the system's redundancy mode will be set to Single-Controller mode.

When the command informs you that the configuration has been restored, you must restart the controllers for the changes to take effect. After restarting the controllers, hosts might not be able to access volumes until you re-map them.

△ 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 mode; required in API mode. 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 erased. Default
parameters will take effect at the next controller reset. Logical devices may not
be accessible until mappings are reconfigured. Are you sure? yes
Success: Command completed successfully. - Device default configuration was
restored.
```

See also • [restart](#)

resume replication

Description Resumes a suspended replication operation on the specified replication 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 replication volume. If the name is not unique across replication sets, specify the `set` parameter.

Example Resume replication on replication volume MV2:

```
# resume replication MV2
Success: Replication Resumed.
```

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 the master volume from the host operating system before using this command. The command will prompt you to ensure the master volume is unmounted 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 19.

`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 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 19.

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. - Rollback was started.
```

See also • [show master-volumes](#)
• [show snapshots](#)

scrub vdisk

Description Analyzes specified vdisks to detect, report, and store information about disk defects. Vdisk-level errors reported include: hard errors, media errors, and bad block replacements (BBRs). Disk-level errors reported include: metadata read errors, SMART events during scrub, bad blocks during scrub, and new disk defects during scrub.

For RAID 3, 5, 6, and 50, scrub checks all parity blocks to find data-parity mismatches. For RAID 1 and 10, scrub compares the primary and secondary disks to find data inconsistencies. For NRAID and RAID 0, scrub checks for media errors.

A 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.

When the scrub is complete, an event with code 207 is logged that specifies whether errors were found. For details, see the Event Descriptions Reference Guide.

Syntax `scrub vdisk vdisks`

Parameters *vdisks*

Names or serial numbers of the vdisks to scrub. For vdisk syntax, see [Command syntax](#) on page 19.

Example Scrub the disks in vdisk vd1:

```
# scrub vdisk vd1
Info: Scrub was started on vdisk vd1.
```

See also

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

set advanced-settings

Description For API use, 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]`
- `[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]`

Parameters `auto-write-back enabled|disabled|on|off`
Optional. Sets whether the cache mode automatically changes to write-back after the trigger condition is cleared.

`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. The interval between background disk scrub finishing and starting again is 24 hours.

`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.

`background-scrub-interval interval`
Optional. Sets the interval 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 automatically changes to write-through when CompactFlash memory fails.

`controller-failure enabled|disabled|on|off`
Optional. Sets whether the cache policy automatically changes to write-through when a controller fails. The default is disabled.

`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).

`emp-poll-rate rate`
Optional. Sets the interval at which the storage system polls the EC (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 automatically changes to write-through when a fan fails.

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

Optional. Sets whether the host can modify the cache setting. The default is `disabled`.

`missing-lun-response notready|illegal`

Optional. Sets the missing-LUN response which enables the host drivers to continue probing for LUNs until they 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`.

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

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

`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`.

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

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

`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. Each disk added after `detect-only` is set retains its SMART setting. Enabled by default.

`super-cap-failure enabled|disabled|on|off`

Optional. Sets whether the cache policy automatically changes to write-through when cache backup power is not fully charged or fails.

`sync-cache-mode immediate|flush`

Optional. Sets the option that controls 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 forces a controller shutdown if a temperature is detected that exceeds system threshold limits.

`utility-priority low|medium|high`

Optional. Sets the priority at which jobs (such as vdisk verification and reconstruction but not background scrub) run with respect to I/O operations competing for the system's processors: `low`, `medium`, or `high`.

`spin-down`

Optional. Enables or disables drive spin-down (DSD) for available disks and global spares. Disabled by default.

`spin-down-delay delay`

Optional. Sets the period of inactivity after which available disks and global spares automatically spin down, from 1–360 minutes. DSD is enabled by a value in this range, or is disabled by the value 0. If DSD is enabled and no delay value is set, the default is 15 minutes.

Example Enable partner firmware upgrade:

```
# set advanced-settings partner-firmware-upgrade enabled
Info: Command completed successfully. - Parameter 'partner-firmware-upgrade' was
set to 'enabled'.
Success: Command completed successfully. - The settings were changed
successfully.
```

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
If the cache policy is set to write-back, specify whether the policy automatically changes to write-through when a controller fails.

super-cap-failure enabled|disabled|on|off
If the cache policy is set to write-back, specify whether the policy automatically changes to write-through when cache backup power is not fully charged or fails.

compact-flash-failure enabled|disabled|on|off
If the cache policy is set to write-back, specify whether the policy automatically changes to write-through when CompactFlash memory fails.

power-supply-failure enabled|disabled|on|off
If the cache policy is set to write-back, specify whether the policy automatically changes to write-through when a power supply fails.

fan-failure enabled|disabled|on|off
If the cache policy is set to write-back, specify whether the policy automatically changes to write-through when a fan fails.

temperature-exceeded enabled|disabled|on|off
Specify whether to force a controller shutdown if a temperature is detected that exceeds system threshold limits.

partner-notify enabled|disabled|on|off
Specify 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.

auto-write-back enabled|disabled|on|off
Specify whether the cache mode automatically changes to write-back after the trigger condition is cleared.

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.
```

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. Settings you can change include:

- [Cache write policy](#)
- [Cache optimization mode](#)
- [Cache read-ahead size](#)

 **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|super-sequential]
[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 to either:

- `write-back (wb)`: Write-back caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput.
- `write-through (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.

`optimization standard|super-sequential`

Optional. Sets the cache optimization mode to either:

- `standard`: Used for applications that read and write small files in random order, such as transaction-based and database update applications.
- `super-sequential`: Used for applications that read and write large files in sequential order, such as video playback and multimedia post-production video and audio editing applications.

`read-ahead-size`

Optional. Controls the use and size of read-ahead cache:

- `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.
- `maximum`: Allows the controller to dynamically calculate the maximum read-ahead cache size for the volume.
- `64KB, 128KB, 256KB, 512KB, 1MB, 2MB, 4MB, 8MB, 16MB, 32MB`: Sets a specific cache size.

volume

Name or serial number of the volume to change. For volume syntax, see [Command syntax](#) on page 19.

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

```
# set cache-parameters optimization super-sequential read-ahead-size maximum V1
Success: Command completed successfully. - Cache parameters were changed
```

See also • [show cache-parameters](#)
• [show volumes](#)

Cache write policy

The cache policy setting for each volume 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 caching does not wait for data to be completely written to disk before signaling the host that the write is complete. This is the preferred setting for a fault-tolerant environment because it improves the performance of write operations and throughput. Write-back caching is enabled by default.
- 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 cache to write-through cache when certain environmental events occur, such as a fan failure. For details, see [set auto-write-through-trigger](#).

Cache optimization mode

Before creating or modifying a volume, determine the appropriate cache optimization mode. The controller supports super-sequential optimization mode for sequential I/O and standard optimization mode for random I/O.

The cache optimization mode setting for each volume optimizes the cache block size used by the controller:

- For sequential optimization, the cache block size is 128 Kbyte.
- For random optimization, the cache block size is 32 Kbyte.

An appropriate cache block size improves performance when a particular application uses either large or small stripe sizes:

- Video playback, multimedia post-production audio and video editing, and similar applications read and write large files in sequential order.
- Transaction-based and database update applications read and write small files in random order.

Since the cache block size works in conjunction with the default stripe size set by the cache optimization mode for each volume you create, these default stripe sizes are consistent with the cache block size setting. You can, however, specify a different stripe size for any volume at the time you create it. For more information, see [create volume](#).

Cache read-ahead size

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.

The default read-ahead size, which sets one chunk for the first access in a sequential read and one stripe for all subsequent accesses, works well for most users in most applications. 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.

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 the originator's IQN.

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 the recipient's IQN. 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 ign.1991-05.com.microsoft:myHost.domain mutual-name  
ign.1995-03.com.acme:01.storage.00c0ffd6000a mutual-secret ABCdef123456  
Success: Command completed successfully. - The CHAP record was changed.
```

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 profile, 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]
[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.

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 mode:

- `console`: Supports interactive use of the CLI by displaying command output in easily readable format. This mode automatically sizes fields according to content and adjusts content to window resizes. This is the default.
- `api`: Supports scripting by displaying command output in XML. All objects are displayed at the same level, related by COMP elements.
- `api-embed`: Alternate form of XML output which displays “child” objects embedded (indented) under “parent” objects. Enabling this option enables the `brief` option.
- `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. When enabled, shows only the name and key properties of objects in API mode. Disabled by default.

`locale English|en`

Optional. The display language.

`pager enabled|on|disabled|off`

Optional. Specifies whether to halt output after each full screen to wait for keyboard input. Enabled by default. When using API mode, which is intended for scripting, disable paging.

`precision #`

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

`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. Specifies to show temperatures in degrees Fahrenheit or Celsius.

timeout #

Optional. Sets the timeout value in seconds for the login session. Valid values are 120–65535. The default is 1800 seconds (30 minutes).

units auto|MB|GB|TB

Optional. Sets the unit for display of storage-space sizes. auto lets the system determine the proper unit for a size. 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 the unit is set to TB and the precision is set to 1, the size 0.11709 TB is shown as 119.9 GB. Default is auto.

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.
```

For scripting, display XML output in api-embed mode with no paging:

```
# set cli-parameters api-embed pager off
<?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="255" draw="true" sort="nosort"
display-name="Response">Command completed successfully. - The settings were
changed 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 12:32:22</PROPERTY>
  <PROPERTY name="time-stamp-numeric" type="uint32" size="25" draw="false"
sort="datetime" display-name="Time">1281443542</PROPERTY>
</OBJECT>
</RESPONSE>
```

For scripting, display brief XML output in API-embed mode with no paging:

```
# set cli-parameters api-embed pager off brief on
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<RESPONSE VERSION="L100" request="cli-parameters">
<OBJECT basetype="status" name="status" oid="1">
  <PROPERTY name="response-type">Success</PROPERTY>
  <PROPERTY name="response-type-numeric">0</PROPERTY>
  <PROPERTY name="response">Command completed successfully. - The settings were
changed successfully.</PROPERTY>
  <PROPERTY name="return-code">0</PROPERTY>
  <PROPERTY name="component-id"></PROPERTY>
  <PROPERTY name="time-stamp" type="string">2010-08-10 12:15:05</PROPERTY>
  <PROPERTY name="time-stamp-numeric" type="string">1281442505</PROPERTY>
</OBJECT>
</RESPONSE>
```


Set CLI to show output in console mode:

```
# set cli-parameters console
```

```
Success: Command completed successfully. - The settings were changed  
successfully.
```

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. Date and time values use Coordinated Universal Time (UTC). You can also set NTP parameters by using the [set ntp-parameters](#) command.

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 configure use of NTP:

```
set controller-date
  ntp enabled | disabled | on | off
  ntpaddress IP-address
  timezone offset
```

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 offset`
The system's time zone as an offset in hours from UTC. For example, the Pacific Time Zone offset is -8 during Pacific Standard Time or -7 during Pacific Daylight Time.

Example Manually set the system date to 1:45 PM on September 22, 2009:

```
# set controller-date sep 22 13:45:0 2009
Success: Command completed successfully.
```

Set the system to use NTP with an offset for Mountain Standard Time:

```
# set controller-date ntp enabled ntpaddress 69.10.36.3 timezone -7
Success: Command completed successfully.
```

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. If multiple types are specified, use spaces to separate them and enclose the list in double quotes.

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
- `bkcfg`: Internal configuration debug messages
- `cache`: Cache debug messages
- `capi`: Internal Configuration API debug messages
- `capi2`: Internal Configuration API tracing debug messages
- `disk`: Disk interface debug messages
- `dms`: Snapshot feature debug messages
- `emp`: Enclosure Management Processor debug messages
- `fo`: Failover/recovery debug messages
- `fruid`: FRU ID debug messages
- `hb`: Not used
- `host`: Host interface debug messages
- `init`: Not used
- `ioa`: I/O interface driver debug messages (standard)
- `iob`: I/O interface driver debug messages (resource counts)
- `ioc`: I/O interface driver debug messages (upper layer, verbose)
- `iod`: I/O interface driver debug messages (lower layer, verbose)
- `mem`: Internal memory debug messages
- `misc`: Internal debug messages
- `msg`: Inter-controller message debug messages
- `mui`: Internal service interface debug messages
- `ps`: Not used
- `raid`: RAID debug messages
- `rcm`: Removable-component manager debug messages
- `res2`: Internal debug messages
- `resmgr`: Reservation Manager debug messages

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.
```

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 (DSD).

- 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 DSD feature monitors disk activity within system enclosures and spins down inactive disks, based on user-specified settings. This command sets DSD parameters for available disks and global spares. To set DSD parameters for a vdisk, use `set vdisk`.

 **NOTE:** DSD 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. Enables or disables SMART monitoring for all disks in the storage system. Each disk added after `detect-only` is set retains its SMART setting. Enabled by default.

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.

`spin-down`

Optional. Enables or disables DSD for available disks and global spares. Disabled by default.

`spin-down-delay delay`

Optional. Sets the period of inactivity after which available disks and global spares automatically spin down, from 1–360 minutes. DSD is enabled by a value in this range, or is disabled by the value 0. If DSD is enabled and no delay value is set, the default is 15 minutes.

Example Enable SMART and DSD, and set the DSD delay to 10 minutes:

```
# set disk-parameters smart on spin-down on spin-down-delay 10
Success: Command completed successfully.
```

See also • `show disk-parameters`

set email-parameters

Description Sets SMTP parameters for event notification.

Syntax `set email-parameters`
 `server server`
 `domain domain`
 `email-list email-addresses`
 `notification-level crit|error|warn|info|none`
 `[sender sender]`

Parameters `server server`

The IP address of the SMTP mail server to use for the email messages.

`domain domain`

The domain name that, with the sender name, forms the “from” address for remote notification.

`email-list email-addresses`

Enter up to four comma-separated email addresses for recipients of event notifications.

`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 Informational, Warning, Error, and Critical events.
- `none`: Disables email notification and clears the settings. This option is the default.

`sender sender`

Optional. The sender name that, with the domain name, forms the “from” address for remote notification.

Example Set the system to send an email from RAIDsystem@mydomain.com to sysadmin@mydomain.com when a Warning event occurs:

```
# set email-parameters server 10.1.1.10 domain mydomain.com email-list
sysadmin@mydomain.com notification-level warn sender RAIDsystem
Info: Set Email Address 1 to: sysadmin@mydomain.com
Info: Set Email Server Name to: 10.1.1.10
Info: Set Email Domain Name to: mydomain.com
Info: Set Email Notification Level to: warn
Info: Set Email Sender Name to: RAIDsystem
```

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 characters except double quote or backslash.

`location location`

The location of the enclosure. The name can include a maximum of 20 bytes, using characters except double quote or backslash.

`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.
```

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.
```

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.
```

See also • [set expander-phy](#)
 • [show enclosure-status](#)
 • [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)

# show expander-status
Encl  Ctlr Phy  Type          Status          Elem Status    Disabled  Reason
-----
...
0      A    0    Egress      Disabled        Non-critical   Disabled  Not ready
```

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)

# show expander-status
Encl  Ctlr Phy  Type          Status          Elem Status    Disabled  Reason
-----
...
0      B    5    Drive        Enabled-Healthy OK              Enabled
```

See also

- [set expander-fault-isolation](#)
- [show enclosure-status](#)
- [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, 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 MyHost
Success: Command completed successfully. - The host name has been changed.
```

Change a host's nickname to MyHost:

```
# set host-name id Host1 MyHost
Success: Command completed successfully. - The host has been changed.
```

Remove the nickname for a discovered host:

```
# set host-name id MyHost
Success: Command completed successfully. - The host nickname was deleted.
```

Remove a manually created host:

```
# set host-name id MyHost
Success: Command completed successfully. - The host entry was deleted.
```

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`

Optional. Specifies whether to apply the settings to all host ports in controller A, B, or both.

`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
- `auto`: Loop preferred, otherwise point-to-point, based on the detected connection type

You must also specify the `controller` 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 mode; required in API mode. 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 19. If this parameter is omitted, all host ports on the specified controllers are affected.

`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`). Use `auto` if the port is directly connected to a host or switch. 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
```

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 restarted.
```

```
Success: Command completed successfully. - The host parameters were changed successfully
```

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 restarted.
```

```
Success: Command completed successfully. - The host parameters were changed successfully
```

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
```

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.
```

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.

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.

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.

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 versions of firmware components are monitored and automatically upgraded on the partner controller.

`utility-priority low|medium|high`
Optional. Sets the priority at which jobs run with respect to I/O operations competing for the system's processors. This affects vdisk verification and reconstruction, but not background scrub.

Example Enable background scrubbing of vdisks and disable partner firmware upgrade:

```
# set job-parameters background-scrub on partner-firmware-upgrade off
Info: Command completed successfully. - Parameter 'background-scrub' was set to 'on'.
Info: Command completed successfully. - Parameter 'partner-firmware-upgrade' was set to 'off'.
Success: Command completed successfully. - The settings were changed successfully.
```

See also • [scrub vdisk](#)
• [set advanced-settings](#)
• [show job-parameters](#)

set led

Description Changes the state of the Unit Identification (UID) LED on a specified disk or enclosure. 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 19.

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...
```

Stop identifying the first enclosure:

```
# set led enclosure 0 off
```

```
Success: Disabling identification LED for enclosure 0...
```

set network-parameters

Description Sets IP values 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.

Syntax To set both controllers' IP values automatically:

```
set network-parameters dhcp
```

To set a controller's IP values manually:

```
set network-parameters
    [ip address]
    [netmask netmask]
    [gateway gateway]
    controller a|b
```

Parameters *dhcp*
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
Specifies whether to apply the settings to controller A or B.

Example Use DHCP to set network port IP values:

```
# set network-parameters dhcp
Success: Command completed successfully. - Network parameters were changed.
```

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. - Network parameters were changed.
```


See also • [show network-parameters](#)

set ntp-parameters

Description Sets Network Time Protocol (NTP) parameters for the system. Date and time values use Coordinated Universal Time (UTC). You can also 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 offset`

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 offset`
The system's time zone as an offset in hours from 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 Mountain Standard Time:

```
# set ntp-parameters ntp enabled ntpaddress 69.10.36.3 timezone -7
Success: Command completed successfully.
```

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. The parameter value is case sensitive; can include a maximum of 19 bytes using characters except a backslash, double quote, or space; and is displayed in clear text. If this parameter is omitted, the command prompts you to enter and re-enter a value, which is displayed encrypted.

`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.
```

Change the password for user JDoe:

```
# set password JDoe password Abc%123
Success: Command completed successfully. (JDoe) - The password was changed.
```

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.

The higher the priority value, the higher priority for retention of associated snapshots. Priority values are 0–65535, where 0 specifies to use the parameter's default value.

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 SnapPool1, raising the priority for standard snapshots and leaving other priorities unchanged:

```
# set priorities only-sync-point 65535 SnapPool1
```

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 valid UTF-8 characters except backslash, double quote, and control characters, and can have a maximum of 16 bytes. A prompt that includes a space must be enclosed in double quotes.

Example Set the prompt to `CLI>` followed by a space, and start entering another command:

```
# set prompt "CLI> "  
Success: Command completed successfully  
CLI> set ...
```

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]

Parameters `debug enabled|disabled|on|off`
Optional. Enables or disables the Telnet debug port.

`ftp enabled|disabled|on|off`
Optional. Enables or disables the expert interface for updating firmware.

`http enabled|disabled|on|off`
Optional. Enables or disables the standard RAIDar web server.

`https enabled|disabled|on|off`
Optional. Enables or disables the secure RAIDar web server.

`ses enabled|disabled|on|off`
Optional. Enables or disables the in-band SCSI Enclosure Management Services interface.

`smis enabled|disabled|on|off`
Optional. Enables or disables the Storage Management Initiative Specification interface (SMI-S) interface, which allows SMI-S clients to communicate with each controller's embedded SMI-S provider.

`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 but still allows SNMP traps to be generated. To configure SNMP traps use the `set snmp-parameters` command.

`ssh enabled|disabled|on|off`
Optional. Enables or disables the secure shell CLI.

`telnet enabled|disabled|on|off`
Optional. Enables or disables the standard CLI.

Example Disable unsecure HTTP connections and enable FTP:

```
# set protocols http disabled ftp enabled
Success: Command completed successfully.
```

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.

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: Command completed successfully. (System2) - Password set
Success: Command completed successfully. (System2) - The remote system was set.
```

See also • [create remote-system](#)
• [delete remote-system](#)
• [remote](#)
• [show remote-systems](#)

```
set replication-external-view
```

Deprecated; use `set replication-primary-volume`.

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 Change replication set RS1's primary volume from MV1 to MV2 and initiate a rollback to snapshot RepSnap3:

```
# set replication-primary-volume volume MV1 primary-volume MV2 set RS1 snapshot RepSnap3
```

See also • `show replication-sets`
• `show replication-volumes`
• `show snapshots`

set replication-volume-parameters

Description Sets parameters for a specified replication volume. This command must be run on the system where the volume resides. The system synchronizes parameter settings for both volumes in a replication set, so after some time, changes made to one volume are automatically applied to the other volume.

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. Although any value can be set, there is a 5-minute (300-second) delay between retries. 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 exceeds 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 recommended.

`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 link-type FC remote-address 10.1.66.55
on-error suspend set RS1 MV2
```

Success: Replication Volume Parameters Changed.

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 four volumes to start replicating at the same time, and for those replications to recur no less than 30 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 when the task will first run.
- `[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.
- `[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 2010-01-01 00:01 every 1 days  
expires 2010-12-31 00:01" task-name Snap Sched1  
Success: Command completed successfully. (Sched1) - The schedule was modified.
```

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 `deleteoldestsnapshots`.

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 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 19.

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. - The snap-pool policy was changed.
```

See also • [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 99% 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.

`error #%`
The percent of snap-pool space used that triggers the error threshold policy. This value must be less than 99%.

`snap-pool`
Name or serial number of the snap pool to set the threshold for. For volume syntax, see [Command syntax](#) on page 19.

Example Set the warning and error thresholds for snap pool SP1:

```
# set snap-pool-threshold warning 60% error 85% SP1
Success: Command completed successfully. - The snap-pool threshold was changed.
```

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 Informational, Warning, Error, and Critical 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 to send traps to. 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. The value is case sensitive and can include letters, numbers, hyphens, and underscores.

`write-community string`

Optional. Sets a community string for write access. The value is case sensitive and can include letters, numbers, hyphens, and underscores.

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.
```

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: Existing spares not specified in this command are deleted and return to being available disks.

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 19.

`vdisk vdisk`
Optional. Name or serial number of the vdisk to assign spares to. For vdisk syntax, see [Command syntax](#) on page 19. 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: Command completed successfully. (1.2) - Global spare disk 1.2 was set.
Success: Command completed successfully.
```

Designate disk 1.3 as a dedicated spare for vdisk VD1:

```
# set spares disks 1.3 vdisk VD1
Info: Command completed successfully. (1.3) - Vdisk spare disk 1.3 was set.
Success: Command completed successfully.
```

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. (2.1) - Disk 2.1 is not the same type
as the ones currently used by the vdisks.
Error: Command failed.
```

Delete all global spares:

```
# set spares disks none
Success: Command completed successfully.
```

Delete all dedicated spares for vdisk VD1:

```
# set spares disks none vdisk VD1
Success: Command completed successfully.
```

See also • [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 characters except double quote or backslash. A value that contains a space must be enclosed in double quotes.

The system name is shown in the browser title bar or tab. The name, location, and contact are included in event notifications. All four values are included in system debug logs for reference by service personnel.

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 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
```

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 19.

`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.
```

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.
```

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.
```

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. You cannot change the access level of user manage.

Syntax `set user`
 `[base 2|10]`
 `[interfaces interfaces]`
 `[level monitor|manage]`
 `[locale English|en]`
 `[password password]`
 `[precision #]`
 `[session-preferences]`
 `[storage-size-base 2|10]`
 `[storage-size-precision #]`
 `[storage-size-units auto|MB|GB|TB]`
 `[temperature-scale celsius|c|fahrenheit|f]`
 `[timeout #]`
 `[type novice|standard|advanced|diagnostic]`
 `[units auto|MB|GB|TB]`
 `user-name`

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.

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 values`

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

- `cli`: Command-line interface.
- `wbi`: Web-browser interface.
- `ftp`: File transfer protocol interface.
- `none`: No interfaces.

`level monitor|manage`

Optional.

- `monitor`: User can view but not change system settings.
- `manage`: User can view and change system settings.

`locale English|en`

Optional. The display language.

`password password`

Optional. Sets a new password for the user. The parameter value is case sensitive; can include a maximum of 19 bytes using characters except a backslash, double quote, or space; and is displayed in clear text.

`precision #`

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

`session-preferences`

Optional. Specifies that the current CLI settings will become permanent settings for the user.

`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. Specifies to use the Celsius scale or Fahrenheit scale for temperature values.

`timeout #`

Optional. Sets the timeout value in seconds for the login session. Valid values are 120–65535. The default is 1800 seconds (30 minutes).

`type novice|standard|advanced|diagnostic`

Optional. Specifies the user's level of technical expertise. The default is `standard`. All user types have access to all commands.

`units auto|MB|GB|TB`

Optional. Sets the unit for display of storage-space sizes. `auto` lets the system determine the proper unit for a size. 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 the unit is set to TB and the precision is set to 1, the size 0.11709 TB is shown as 119.9 GB. Default is `auto`.

user-name

Specifies the user profile 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.

Change the password for user `JDoe`:

```
# set user JDoe password Abc%123
```

Success: Command completed successfully. (JDoe) - The password was changed.

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 19.

`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. Drive spin-down (DSD) is enabled by a value in this range, or is disabled by the value 0. If DSD is enabled and no delay value is set, the default is 15 minutes.

 **NOTE:** DSD 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 19.

Example Rename vdisk VD1, change its owner to controller A, and set its DSD delay to 10 minutes:

```
# set vdisk name VD2 owner a spin-down-delay 10 VD1
```

```
Success: Command completed successfully.
```

See also • [show vdisks](#)

set volume

Description Changes a volume's name.

Syntax `set volume`
 `name new-name`
 `volume`

Parameters `name new-name`
A new name for the volume. For volume syntax, see [Command syntax](#) on page 19.

`volume`
Name or serial number of the volume to change. For volume syntax, see [Command syntax](#) on page 19.

Example Rename volume V1 to V2:

```
# set volume name V2 V1
Success: Command completed successfully. - The volume was set.
```

See also • [show host-maps](#)
 • [show volumes](#)
 • [show volume-maps](#)

show advanced-settings

Description For API use, 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.

`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 upgraded on the partner controller.

`Utility Priority`

Priority at which jobs (such as vdisk verification and reconstruction but not background scrub) run with respect to I/O operations competing for the system's processors: High, Medium, or Low.

`SMART`

Shows whether Self-Monitoring Analysis and Reporting Technology is enabled or disabled for all disks, or is set to detect-only, which specifies that each new drive inserted in the system retains its current SMART setting.

`Dynamic Spare Configuration`

Shows whether the storage system will automatically designate a properly sized drive as a spare.

`Enclosure Polling Rate`

Shows the interval at which the storage system polls the EC (EMP) for status changes.

`Host Control of Caching`

Shows whether host control of write-back cache is enabled or disabled. When disabled, hosts cannot use the `SCSI MODE SELECT` command to change the storage system's cache setting.

`Sync Cache Mode`

Shows how the `SCSI SYNCHRONIZE CACHE` command is handled:

- `Immediate` – Good status is returned immediately and cache content is unchanged.
- `Flush To Disk` – Good status is returned only after all write-back data for the specified volume is flushed to disk.

`Missing LUN Response`

Missing LUN Response enables the host drivers to continue probing for LUNs until they 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 its “not ready.” Sense data returned is sensekey = 2, code = 4, qualifier = 3.
- `Illegal Request` – Sends a reply that there is a LUN but that the request is “illegal.” Sense data returned is sensekey = 5, code = 25h, qualifier = 0.

`Controller Failure`

Shows whether the cache policy automatically changes to write-through when a controller fails.

`Supercap Failure`

Shows whether the cache policy automatically changes to write-through when cache backup power is not fully charged or fails.

`CompactFlash Failure`

Shows whether the cache policy automatically changes to write-through when CompactFlash memory fails.

`Power Supply Failure`

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

Fan Failure

Shows whether the cache policy automatically changes to write-through when a fan fails.

Temperature Exceeded

Shows whether the system forces a controller shutdown when a temperature is detected that exceeds system threshold limits.

Partner Notify

Shows whether the partner controller is notified when a trigger condition occurs.

Auto Write Back

Shows whether the cache mode automatically changes to write-back after the trigger condition is cleared.

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.

Drive Spin Down Non-Vdisk Delay

Specifies the period of inactivity after which available disks and global spares automatically spin down, from 1–360 minutes, or 0 if 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.

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
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
```

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`

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
```

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 19. If this parameter is not specified, only system-wide settings are shown.

Output System/controller cache parameters:

Operation Mode

The operation mode, also called the redundancy mode.

- Active-Active ULP: Both controllers are active using ULP (Unified LUN Provisioning).
- Single-Controller: There is only a single controller in the enclosure.

Write Back Status

Shows whether write-back caching is enabled for the controller

CompactFlash Status

Shows whether the controller's CompactFlash card is installed

Cache Flush

Shows whether cache flush is enabled for the controller

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 policy, either write-back or write-through

Cache Optimization

If a volume is specified, its cache optimization mode, either standard (random) or super-sequential

Read Ahead Size

If a volume is specified, its read-ahead cache setting

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
```

See also • `set cache-parameters`
• `show volumes`

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 the originator's IQN. 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
```

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

Timeout value in seconds for the login session.

Output Format

- `console`: Output is shown in human-readable format.
- `api`: Output is shown in XML format.
- `api-embed`: Output is shown in XML format and “child” objects are shown 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, only the name and key properties of objects are shown.
- `Disabled`: In XML output, all properties of objects are shown.

Base

- `2`: Storage sizes are entered and shown in base 2.
- `10`: Storage sizes are entered and shown in base 10.

Pager

- `Enabled`: Output halts after each full screen until a key is pressed or all output is shown.
- `Disabled`: All output is shown.

Locale

Display language.

Precision

Number of decimal places shown for storage sizes.

Units

- `auto`: Storage sizes are shown in units determined by the system.
- `MB`: Storage sizes are shown in megabytes.
- `GB`: Storage sizes are shown in gigabytes.
- `TB`: Storage sizes shown in 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.

Temperature Scale

- `Fahrenheit`: Temperatures are shown in degrees Fahrenheit.
- `Celsius`: Temperatures are shown in degrees Celsius.

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
```

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, including SCSI Enclosure Services (SES) data from `show enclosure-status`
- Field-replaceable unit (FRU) information from `show frus`

show controller-date

Description Shows the system's current date and time. Values are shown in Coordinated Universal Time (UTC).

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 from 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: 2009-06-09 10:58:04
Time-Zone Offset: -6
```

See also • [set controller-date](#)
• [show ntp-status](#)

show controllers

Description Shows information about each controller in the storage system.

Syntax show controllers

Output Controller ID

Serial Number

Hardware Version

CPLD Version

MAC Address

WWNN

IP Address

IP Subnet Mask

IP Gateway

Disks

Number connected to this controller

Vdisks

Number owned by this controller

Cache Memory Size (MB)

Host Ports

Number of host ports

Disk Channels

Number of expansion ports

Disk Bus Type

Status

Running, Down, Not Installed, or Unknown

Failed Over

No or Yes

Fail Over Reason

If Failed Over is Yes, a reason for the failover appears; otherwise, Not applicable appears

Position

Top or Bottom

Phy Isolation

Enabled or Disabled

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: Running
Failed Over: No
Fail Over Reason: Not applicable
Position: Top
Phy Isolation: Enabled

Controller ID: B
...
```

See also • [show configuration](#)
• [show frus](#)

show controller-statistics

Description Shows performance statistics for controller A, B, or both.

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.

Write Cache Used
(API only) Percentage of write cache in use, from 0–100.

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
(API only) 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.

Example Show statistics for both controllers:

# show controller-statistics				
Durable ID	CPU Load	Power On Time (Secs)	Bytes per second	
Number of Reads	Number of Writes	Data Read	Data Written	

controller_A	0	17563	0B	
115	15	654.3KB	61.4KB	
controller_B	0	17564	0B	
0	0	0B	0B	

- See also**
- [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

- awt: Auto-write-through cache triggers debug messages
- bkcfg: Internal configuration debug messages
- cache: Cache debug messages
- capi: Internal Configuration API debug messages
- capi2: Internal Configuration API tracing debug messages
- disk: Disk interface debug messages
- dms: Snapshot feature debug messages
- emp: Enclosure Management Processor debug messages
- fo: Failover/recovery debug messages
- fruid: FRU ID debug messages
- hb: Not used
- host: Host interface debug messages
- init: Not used
- ioa: I/O interface driver debug messages (standard)
- iob: I/O interface driver debug messages (resource counts)
- ioc: I/O interface driver debug messages (upper layer, verbose)
- iod: I/O interface driver debug messages (lower layer, verbose)
- mem: Internal memory debug messages
- misc: Internal debug messages
- msg: Inter-controller message debug messages
- mui: Internal service interface debug messages
- ps: Not used
- raid: RAID debug messages
- rcm: Removable-component manager debug messages
- res2: Internal debug messages
- resmgr: Reservation Manager debug messages

Example Show debug log parameters:

```
# show debug-log-parameters
host: On
disk: On
mem: Off
...
```

See also • [set debug-log-parameters](#)

show disk-parameters

Description Shows disk settings.

Syntax `show disk-parameters`

Output SMART

Shows whether SMART is enabled or disabled for all disks, or is set to detect-only, which specifies that each new disk inserted in the system retains its current SMART setting.

Drive Write Back Cache

Shows whether write-back cache for each disk in or added to the system will be enabled or disabled or a rescan or controller restart. Don't Modify means that each disk's current setting will not be modified.

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 DSD is enabled for available disks and global spares.

Drive Spin Down Non-Vdisk Delay

Shows the number of minutes after which inactive available disks and global spares automatically spin down. If the delay is 0, DSD 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
```

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 disks.

 **NOTE:** In console mode, to aid reading, disks are sorted to display in order by enclosure and disk number. In other modes, output is not sorted because it is expected to be manipulated by a host application.

Syntax `show disks`
 `[disks|free|all|encl]`
 `[vdisk vdisk]`

Parameters `disks|free|all|encl`

Optional. Specifies the disks to report information about:

- `disks`: IDs of the disks to show information about. For disk syntax, see [Command syntax](#) on page 19.
- `free`: Shows information about all disks that are available.
- `all`: Shows information about all installed disks.
- `encl`: Shows information about all disks by enclosure. This option shows different fields than the other options and shows each disk slot, whether it contains a disk or not.

`vdisk vdisk`

Shows information for disks in the specified vdisk. For vdisk syntax, see [Command syntax](#) on page 19.

Output **Without the `encl` option:**

Location

Disk's enclosure and slot number

Serial Number

Disk serial number

Vendor

Disk vendor

Rev

Firmware revision number

How Used

- AVAIL: Available
- 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:

- 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

Size
Disk capacity

Rate (Gb/s)
Data transfer rate in Gbit/second

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

Status
Disk status: Up, Spun Down, Warning, Error, Not Present, Unknown, or Disconnected

With the `encl` option:

Status
Disk status: Up, Spun Down, Warning, Error, Not Present, Unknown, or Disconnected

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 disks:

```
# show disks
Location Serial Number      Vendor  Rev  How Used  Type  Size
Rate(Gb/s)  SP Status
-----
0.0      SN                vendor  rev  VDISK      SAS   146.8GB
 3.0                      Up
0.1      SN                vendor  rev  AVAIL      SAS   146.8GB
 3.0                      Up
0.2      SN                vendor  rev  LEFTOVR    SAS   146.8GB
 3.0                      Up
0.3      SN                vendor  rev  VDISK SP   SAS   146.8GB
 3.0                      Up
...
1.0      SN                vendor  rev  GLOBAL SP  SATA-S 120.0GB
 3.0      A  Up
1.1      SN                vendor  rev  VDISK VRFY SATA-S 120.0GB
 3.0      A  Up
...
```

Show information for all disks, by enclosure:

```
# show disks encl
```

Status	Encl	Slot	Vendor	Model	Serial Number	Size
Up	0	0	<i>vendor</i>	<i>model</i>	<i>SN</i>	146.8GB
Not Present	0	1	N/A	N/A	N/A	N/A
...						

See also • [show vdisks](#)

show disk-statistics

Description Shows performance statistics for all or specified disks.

Syntax `show disk-statistics [disks]`

Parameters *disks*

Optional. IDs of the disks to show information about. For disk syntax, see [Command syntax](#) on page 19. If this parameter is omitted, information is shown for all disks.

Output 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.

Queue Depth

(API only) Number of pending I/O operations currently being serviced.

SMART Event Count Port #

(API only) Number of SMART events recorded.

I/O Timeout Count Port #

(API only) Number of timeouts accessing the disk.

No-response Count Port #

(API only) Number of times the disk did not respond.

Spinup Retry Count Port #

(API only) Attempts by the storage system to spin up the disk.

Number of Media Errors Port #

(API only) Generated by the disk as specified by its manufacturer.

Number of Non-media Errors Port #

(API only) Other errors generated by the storage system, or by the disk and not categorized as media errors.

Number of Block Reassignments Port #

(API only) Number of times blocks were reassigned to alternate locations.

Number of Bad Blocks Port #

(API only) Number of bad blocks encountered.

Example Show statistics for disks 1.1 and 2.1:

```
# show disk-statistics 1.1,2.1
Disk Statistics
-----
Durable ID: disk_1.1
Serial Number: SN
Bytes per second: 0B
IOPS: 0
Number of Reads: 2101
Number of Writes: 63
Data Read: 99556.3KB
Data Written: 659.4KB

Durable ID: disk_2.1
...
```

See also

- `reset controller-statistics`
- `reset disk-error-statistics`
- `show controller-statistics`
- `show disks`
- `show host-port-statistics`
- `show vdisk-statistics`
- `show volume-statistics`

show email-parameters

Description Shows email (SMTP) parameters for event notification.

Syntax `show email-parameters`

Example Show settings for email notification of events:

```
# 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:
Email Address 4:
Email Server: 10.1.1.10
Email Domain: mydomain.com
Email Sender: RAIDsystem
```

See also • `set email-parameters`

show enclosures

Description Shows information about the enclosures in the storage system. Full detail available in 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	2U24-6G: 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 2U12-6G: 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

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
-----
0      WWN      Controller Lab      0      4      vendor  model
0:31 1024      1:31 1024      2U24-3G
-----
```

See also

- [set enclosure](#)
- [show enclosure-status](#)

show enclosure-status

Description 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

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

#

Unit 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 such as fan speed (RPM), temperature (Celsius), voltage, or slot address

Example Show enclosure status:

```
# show enclosure-status
Chassis
EMP B CH:ID Rev WWPN      Vendor      Product ID      CPLD EMP A CH:ID Rev
                        Status
-----
SN
1:31 1024      WWPN      vendor      product      10    0:31 1024
                        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
...
Voltage    00 OK      PN           SN           voltage=11.86V
...
Disk       00 OK      PN           SN           addr=0
...
-----
```

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. Timestamps use Coordinated Universal Time (UTC).

For event descriptions and recommended actions, see the event descriptions reference guide.

Syntax To show a certain number of events:

```
show events
    [last #]
    [a|b|both|error]
```

To show events by time:

```
show events
    [from timestamp]
    [to timestamp]
    [a|b|both|error]
```

To show events by ID:

```
show events
    [from-event ID]
    [to-event ID]
    [a|b|both|error]
```

Parameters *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, 043009235900 represents April 30 2009 at 11:59:00 p.m. This parameter can be used with either *to* parameter.

to timestamp

Optional. Shows events before and including a timestamp specified with the format *MMDDYYhhmmss*. For example, 043009235900 represents April 30 2009 at 11:59:00 p.m. This parameter can be used with either *from* parameter.

from-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. This parameter can be used with either *to* parameter.

to-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. This parameter can be used with either *from* parameter.

a|b|both|error

Optional. Specifies to filter the event listing:

- *a*: Shows events from controller A only
- *b*: Shows events from controller B only
- *error*: Shows all critical, error, and warning events but no informational events

- Output**
- Date and time when the event was logged
 - Event code identifying the type of event to help service technicians 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 2009 at 11:59:00 p.m. through May 2 2009 at 11:59:00 a.m.:

```
# show events from 043009235900 to 050209115900
```

Show a range of events logged by controller A:

```
# show events from-event a100 to-event a123
```

- 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.

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: Unused PHY.

Status

- Enabled-Healthy: The PHY is enabled and healthy.
- Enabled-Degraded: The PHY is enabled but degraded.
- Disabled: The PHY has been disabled by a user or by the system.

Elem Status

A standard SES status for the element:

- Disabled: Critical condition is detected.
- Error: Unrecoverable condition is detected. Appears only if there is a firmware problem related to PHY definition data.
- Non-critical: Non-critical condition is detected.
- Not Used: Element is not installed in enclosure.
- OK: Element is installed and no error conditions are known.
- Unknown: Either:
 - Sensor has failed or element status is not available. Appears only if an I/O module indicates it has fewer PHYs than the reporting I/O module, in which case all additional PHYs are reported as unknown.
 - Element is installed with no known errors, but the element has not been turned on or set into operation.

Disabled

- Enabled: PHY is enabled.
- Disabled: PHY is disabled.

Reason

- 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 Non-critical    Enabled
...
0      A    3    Egress         Enabled-Healthy Non-critical    Enabled
-----

Encl  Ctlr Phy  Type          Status          Elem Status    Disabled
Reason
-----
0      B    0    Drive          Enabled-Healthy OK              Enabled
0      B    1    Drive          Enabled-Healthy OK              Enabled
...
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 Non-critical    Enabled
...
0      B    3    Egress         Enabled-Healthy Non-critical    Enabled
-----
```

See also

- `clear expander-status`
- `set expander-fault-isolation`
- `set expander-phy`

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
- 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* (UTC), 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

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
- none: 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
```

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
- FC (P) : Fibre Channel Point-to-Point
- FC (-) : Fibre Channel disconnected
- SAS: Serial Attached SCSI
- iSCSI: Internet SCSI

Target ID

Enclosure WWN or serial number

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

Topo (C)

FC and SAS only. Configured topology.

Width

SAS only. Number of SAS lanes in the port.

PID

FC and SAS only. Primary 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 Address

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)
-----
A0    FC(L)      WWPN              Up           8Gb      Auto
      Topo(C) PID
      -----
      Loop      0

A1    FC(-)      WWPN              Disconnected      Auto
      Topo(C) PID
      -----
      Loop
```

Show port information for a system with two iSCSI ports:

```
# show host-parameters
Ports Media      Target ID          Status      Speed(A) Speed(C)
-----
A0    iSCSI      IQN              Up           1Gb      1Gb
      IP-Ver PIP          PIP-Gateway PIP-Netmask MAC Address
      -----
      IPv4    10.134.9.100 10.134.0.1 255.255.0.0 00:C0:FF:29:00:24

A1    iSCSI      IQN              Up           1Gb      1Gb
      IP-Ver PIP          PIP-Gateway PIP-Netmask MAC Address
      -----
      IPv4    10.134.9.101 10.134.0.1 255.255.0.0 00:C0:FF:29:00:23
```

Show port information for a system with two SAS ports:

```
# show host-parameters
Ports Media      Target ID          Status      Speed(A) Speed(C)
-----
A0    SAS        WWPN              Disconnected
      Topo(C) Width
      -----
      Direct  4

A1    SAS        WWPN              Disconnected
      Topo(C) Width
      -----
      Direct  4
```

See also • [set host-parameters](#)
• [show ports](#)

show host-port-statistics

Description Shows performance statistics for each controller host port.

Syntax `show host-port-statistics`

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 currently being serviced.

Example Show host-port statistics:

```
# show host-port-statistics
Host Port Statistics
-----
Durable ID: hostport_A0
Bytes per second: 0B
IOPS: 0
Number of Reads: 0
Number of Writes: 0
Data Read: 0B
Data Written: 0B
Queue Depth: 0

Durable ID: hostport_A1
...
```

See also

- `reset controller-statistics`
- `show controller-statistics`
- `show disk-statistics`
- `show vdisk-statistics`
- `show volume-statistics`

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
Host interface type: FC; iSCSI; SAS.

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			

See also

- [create host](#)
- [delete host](#)
- [set host-name](#)

show inquiry

Description Shows inquiry data for each controller module.

Syntax `show inquiry`

Output • Management Controller firmware version and loader version
• Storage Controller firmware version and loader version
• FRU 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
Inquiry Controller A
-----
Management Controller Code Version: L100R001
Management Controller Loader Code Version: 1.3
Storage Controller Code Version: T100R01
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
```

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
```

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 Scrub

Shows whether disks in vdisks are automatically checked for disk defects to ensure system health.

Partner Firmware Upgrade

Shows whether component firmware versions are monitored and will be automatically upgraded on the partner controller.

Utility Priority

Priority at which jobs (such as vdisk verification and reconstruction but not background scrub) run with respect to I/O operations competing for the system's processors: High, Medium, or Low.

Example Show a system's job parameters:

```
# show job-parameters
Job Parameters
-----
Vdisk Scrub: Disabled
Partner Firmware Upgrade: Enabled
Utility Priority: High
```

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 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.

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
```

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 19.

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
- 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 snap-pool SP1
Vdisk Serial Number          Name Size      Status
Status-Reason                Snap-pool Name Snapshots Snap Data Rollback
-----
VD1  SN                      MV1  19.9GB    Available
--                               1         0B        ---
VD1  SN                      MV2  9999.9MB  Unavailable
SP Not Accessible            SP2         0         0B        0%
-----
```


- 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 network settings for each controller module.

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

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: 00:C0:FF:0A:A3:26
Addressing Mode: DHCP

Network Parameters Controller B
-----
IP Address: 10.134.129.189
Gateway: 10.134.0.1
Subnet Mask: 255.255.0.0
MAC Address: 00:C0:FF:0A:A3:14
Addressing Mode: DHCP
```

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: 00:C0:FF:0A:43:18
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: 00:C0:FF:0A:43:26
Addressing Mode: Manual
```

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* (UTC), 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: 2009-12-04 16:24:42
```

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
- FC (L) : Fibre Channel-Arbitrated Loop
- FC (-) : Not applicable, as when the port is disconnected
- SAS: Serial Attached SCSI
- iSCSI: Internet SCSI

Target ID

Enclosure WWN or serial number

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

Topo (C)

FC and SAS only. Configured topology

Width

SAS only. Number of SAS lanes in the port.

PID

FC and SAS only. Primary 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 Address

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)
A0	FC (L)	WWPN	Up	8Gb	Auto
	Topo (C)	PID			
	Loop	0			

A1	FC (-)	WWPN	Disconnected		Auto
	Topo (C)	PID			
	Loop				

Show port information for a system with two iSCSI ports:

```
# show ports
```

Ports	Media	Target ID	Status	Speed (A)	Speed (C)
A0	iSCSI	IQN	Up	1Gb	1Gb
	IP-Ver	PIP	PIP-Gateway	PIP-Netmask	MAC Address
	IPv4	10.134.9.100	10.134.0.1	255.255.0.0	00:C0:FF:29:00:24

A1	iSCSI	IQN	Up	1Gb	1Gb
	IP-Ver	PIP	PIP-Gateway	PIP-Netmask	MAC Address
	IPv4	10.134.9.101	10.134.0.1	255.255.0.0	00:C0:FF:29:00:23

Show port information for a system with two SAS ports:

```
# show ports
```

Ports	Media	Target ID	Status	Speed (A)	Speed (C)
A0	SAS	WWPN	Disconnected		
	Topo (C)	Width			
	Direct	4			

A1	SAS	WWPN	Disconnected		
	Topo (C)	Width			
	Direct	4			

See also • [set host-parameters](#)

show power-supplies

Description Shows information about each power supply in the storage system.

Syntax show power-supplies

Output Serial Number
Power supply serial number

Name
Power supply identifier and location

Rev
Power supply revision number

Model
Power supply model number

Part Number
Power supply part number

FRU Shortname
Short name of the power-supply FRU

Example Show power-supply information:

```
# show power-supplies
Serial Number  Name                               Rev  Model      Part Number
FRU Shortname
-----
SN              PSU 0 Loc:left-PSU      A    model      PN
AC Power Supply
SN              PSU 1 Loc:right-PSU     A    model      PN
AC Power Supply
-----
```

See also • [show frus](#)

show priorities

Description Shows a specified snap pool's snapshot retention priorities. Snap-pool priorities, in conjunction with snapshot priorities, determine which snapshots are retained if system resource limitations require some snapshots to be automatically deleted.

Priority values are 0–65535. Lower-priority snapshots will be deleted before higher-priority snapshots.

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.

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)
-----
```

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
File Transfer Protocol (FTP): Disabled
Simple Network Management Protocol (SNMP): Enabled
Service Debug (Debug): Disabled
In-band SES Management (SES): Enabled
```

See also • [set protocols](#)

show redundancy-mode

Description Shows the redundancy status of the system.

Syntax show redundancy-mode

Output Redundancy Mode

The redundancy mode, also called the operation mode.

- **Active-Active ULP:** Both controllers are active using ULP (Unified LUN Provisioning). 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.

Redundancy Status

- **Redundant:** Both controllers are operational.
- **Operational but not redundant:** In active-active mode, one controller is operational and the other is offline. In single-controller mode, the controller is operational.

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 Show the redundancy status of a dual-controller system where controller A is offline:

```
# show redundancy-mode
```

```
System Redundancy
```

```
-----
```

```
Redundancy Mode: Active-Active ULP
```

```
Redundancy Status: Operational but not redundant
```

```
Controller A Status: Down
```

```
Controller A Serial Number: Not Available
```

```
Controller B Status: Operational
```

```
Controller B Serial Number: 00C0FF0A4326
```

Show the redundancy status of an operational dual-controller system:

```
# show redundancy-mode
```

```
System Redundancy
```

```
-----
```

```
Redundancy Mode: Active-Active ULP
```

```
Redundancy Status: Redundant
```

```
Controller A Status: Operational
```

```
Controller A Serial Number: 00C0FF0A4318
```

```
Controller B Status: Operational
```

```
Controller B Serial Number: 00C0FF0A4326
```

`show refresh-counters`

Description In API mode, shows when the data represented by the base type was last updated.

Syntax `show refresh-counters`

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: 2009-11-10 12:58:15
```

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
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.

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 replication-volume images, not primary images:

Status
Status of the replication image: Complete, Create-Snapshot, Queued, Replicating, Suspended, Offline, or Failed.

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

Total time (*hh:mm:ss*) of replication, including any suspension time.

Example Show information about replication images for replication set rsvol1:

```
# show replication-images rsvol1
```

Volume Summary [Name (vd01_v001) Serial Number (*SN*)

Type (Primary Volume)] Images:

Image Serial Number	Image Name	Snapshot Serial
Snapshot Name	Creation Date/Time	

<i>SN</i>	vd01_v001_i01	<i>SN</i>
vd01_v001_i01	2009-01-14 14:24:33	
<i>SN</i>	vd01_v001_i02	<i>SN</i>
vd01_v001_i02	2009-01-14 14:25:33	

Volume Summary [Name (rvd01_v001) Serial Number (*SN*)

Type (Secondary Volume)] Images:

Image Serial Number	Image Name	Snapshot Serial
Snapshot Name	Creation Date/Time	

<i>SN</i>	vd01_v001_i01	<i>SN</i>
Snap12319447290	2009-01-14 14:52:09	
Status	Progress Start Date/Time	Last Update
Suspended	Est Complete	Time

Complete	N/A	2009-01-14 14:24:34
N/A	N/A	2009-01-14 14:52:09
		00:27:35

<i>SN</i>	vd01_v001_i02	<i>SN</i>
Snap12319447530	2009-01-14 14:52:33	
Status	Progress Start Date/Time	Last Update
Suspended	Est Complete	Time

Complete	N/A	2009-01-14 14:52:09
N/A	N/A	2009-01-14 14:52:33
		00:00:24

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 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

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 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.

Remote Address

Remote IP addresses associated with the replication volume.

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	Priority		

vd01_v001	SN		Online	N/A	OK
Remote	vd01_v001	SN			
Online		32	1800	Retry	iSCSI
Oldest	60	Medium			

Remote Address

IP=10.134.9.46:3260
IP=10.134.9.47:3260
IP=10.134.9.48:3260
IP=10.134.9.49:3260

rvd01_v001	SN		Online	N/A	OK
Local	vd01_v001	SN			
Online		32	1800	Retry	iSCSI
Oldest	60	Medium			

Remote Address

IP=10.134.9.40:3260
IP=10.134.9.41:3260
IP=10.134.9.42:3260
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 Priority
-----
rData      SN                      Online N/A          OK
  Remote   Data          SN
    Online      32      1800      Retry    FC
    Oldest      60      Medium
Remote Address
-----
FCPortWWN=207000c0ff000991
FCPortWWN=217000c0ff000991
FCPortWWN=247000c0ff000991
FCPortWWN=257000c0ff000991

Data      SN                      Online N/A          OK
  Local   Data          SN
    Online      32      1800      Retry    FC
    Oldest      60      Medium
Remote Address
-----
FCPortWWN=207000c0ff000bee
FCPortWWN=217000c0ff000bee
FCPortWWN=247000c0ff000bee
FCPortWWN=257000c0ff000bee
```

- 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 `Name`
Replication volume name.

`Serial Number`
Replication volume serial number.

`Status`
Replication volume status: Detached, Establishing proxy, Inconsistent, Initializing, Offline, Online, Replicate-Delay, Replicating, Suspended, or N/A. 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 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`
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 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.

Remote Address

Remote IP addresses associated with the replication volume.

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 Priority
-----
vd01_v001 SN                      Online N/A                      OK
Local     vd01_v001      SN
Online    32          1800          Retry    iSCSI
Oldest    60          Medium
Remote Address
-----
IP=10.134.9.42:3260
IP=10.134.9.43:3260
IP=10.134.9.40:3260
IP=10.134.9.41:3260

rvd01_v001 SN                      Online N/A                      OK
Local     vd01_v001      SN
Online    32          1800          Retry    iSCSI
Oldest    60          Medium
Remote Address
-----
IP=10.134.9.42:3260
IP=10.134.9.43:3260
IP=10.134.9.40:3260
IP=10.134.9.41:3260
```

See also • [show replication-sets](#)

show sas-link-health

Description Shows the condition of SAS 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
Status of the connection:

- Up
- Disconnected
- Not Present
- Warning
- Error
- Unknown

Health
Relative status of the connection:

- OK
- Degraded
- Fault
- Unknown

Example Show the condition of SAS port connections in a two-enclosure system:

```
# show sas-link-health
```

Encl	Ctlr	Name	Status	Health

0	A	Out Port	Up	OK
0	B	Out Port	Up	OK

Encl	Ctlr	Name	Status	Health

1	A	In Port	Up	OK
1	A	Out Port	Disconnected	N/A
1	B	In Port	Up	OK
1	B	Out Port	Disconnected	N/A

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 2009-02-19 23:47:00, Every 3 Minutes
Status: Ready
Next Time: 2009-02-23 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
```

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 2009-02-19 23:47:00, Every 3 Minutes
Status: Ready
Next Time: 2009-02-23 12:59:00
Task To Run: Snap
Error Message:

Tasks
-----
Task Name: Snap
Task Type: TakeSnapshot
Task 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: ResetSched
...
```

See also • [create schedule](#)
• [delete schedule](#)
• [show schedule-details](#)

show sensor-status

Description Shows temperatures and voltages of controller modules and power supplies. These values are reported by environmental sensors in each controller module (Ctrl, IOM) and power supply (PSU).

Normal and error ranges for temperature and voltage are specified in the setup guide.

Syntax show sensor-status

Output 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.
- Other: Status is not available for some other reason.

Example Show temperature and voltage status for the controllers and power supplies:

```
# show sensor-status
Sensor Name                               Value      Status
-----
On-Board Temperature 1-Ctrlr A            55         OK
On-Board Temperature 1-Ctrlr B            54         OK
On-Board Temperature 2-Ctrlr A            76         OK
On-Board Temperature 2-Ctrlr B            69         OK
On-Board Temperature 3-Ctrlr A            53         OK
On-Board Temperature 3-Ctrlr B            55         OK
Disk Controller Temp-Ctrlr A              31         OK
Disk Controller Temp-Ctrlr B              30         OK
Memory Controller Temp-Ctrlr A            71         OK
Memory Controller Temp-Ctrlr B            76         OK

Capacitor Pack Voltage-Ctrlr A            8.20       OK
Capacitor Pack Voltage-Ctrlr B            8.12       OK
Capacitor Cell 1 Voltage-Ctrlr A          2.04       OK
Capacitor Cell 1 Voltage-Ctrlr B          2.02       OK
Capacitor Cell 2 Voltage-Ctrlr A          2.04       OK
Capacitor Cell 2 Voltage-Ctrlr B          2.08       OK
Capacitor Cell 3 Voltage-Ctrlr A          2.03       OK
Capacitor Cell 3 Voltage-Ctrlr B          2.02       OK
Capacitor Cell 4 Voltage-Ctrlr A          2.08       OK
Capacitor Cell 4 Voltage-Ctrlr B          2.00       OK
Capacitor Charge-Ctrlr A                  100%       OK
Capacitor Charge-Ctrlr B                  100%       OK
Overall Unit Status                       OK         OK
```

Temperature	Loc: upper-IOM A	42	OK
Temperature	Loc: lower-IOM B	38	OK
Temperature	Loc: left-PSU	33	OK
Temperature	Loc: right-PSU	36	OK
Voltage	12V Loc: upper-IOM A	11.92	OK
Voltage	5V Loc: upper-IOM A	5.08	OK
Voltage	12V Loc: lower-IOM B	11.86	OK
Voltage	5V Loc: lower-IOM B	5.08	OK
Voltage	12V Loc: left-PSU	11.93	OK
Voltage	5V Loc: left-PSU	5.11	OK
Voltage	3.3V Loc: left-PSU	3.48	OK
Voltage	12V Loc: right-PSU	12.04	OK
Voltage	5V Loc: right-PSU	5.13	OK
Voltage	3.3V Loc: right-PSU	3.49	OK
Current	12V Loc: upper-IOM A	4.33	OK
Current	12V Loc: lower-IOM B	4.42	OK
Current	12V Loc: left-PSU	5.17	OK
Current	5V Loc: left-PSU	7.24	OK
Current	12V Loc: right-PSU	5.80	OK
Current	5V Loc: right-PSU	7.15	OK

See also • [show enclosure-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
```

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#

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, Error, and Critical)

%Usage

Threshold value (percent of snap pool space used) that triggers the threshold's policy

Policy

Recovery policy invoked when threshold value is reached

SizeToExpand

Increment size by which the snap pool is automatically expanded each time the threshold level is reached. This parameter applies when the `AutoExpand` policy is active; otherwise its value is N/A.

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 374.6GB 374.6GB 1 2
Available
Threshold %Usage Policy SizeToExpand
-----
Warning 75% Notify Only N/A
Error 90% Auto Expand 5013.5KB
Critical 99% Delete Snapshots N/A
-----
```

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 19.

`snap-pool volume`
Optional. Shows snapshots associated with the specified snap pool name or serial number. For volume syntax, see [Command syntax](#) on page 19.

`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`
Indicates whether the snapshot 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
- 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
- Unknown

`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 priority for the snapshot type

User Priority

User-defined priority for the snapshot type

Type

- Standard Snapshot
- Replication Snapshot
- Replication Snapshot (Replicating)
- Replication Snapshot (Current Sync Point)
- Replication Snapshot (Common Sync Point)
- Replication Snapshot (Only Sync Point)
- Replication Snapshot (Queued)
- Replication Snapshot (Awaiting Replicate)
- N/A
- Unknown

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
Type	User Priority		
vd03	SN	vd03_v001_i01	2009-01-12 15:23:19
Available	N/A	vd03_v001	spvd03_v001
35.4GB	2624.5PB	0B	0x6000 0x0000
Standard Snapshot			

See also • [show master-volumes](#)
• [show snap-pools](#)

show snmp-parameters

Description Shows SNMP settings for event notification.

Syntax `show snmp-parameters`

Output SNMP

- enabled: SNMP notification is enabled
- disabled: SNMP notification is disabled

To enable or disable requests to the SNMP agent use the `set protocols` command.

SNMP Filter

- crit: Only critical events are sent as traps
- warn: All critical events and warnings 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: enabled
SNMP Filter: 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
```

See also • `set snmp-parameters`
• `set protocols`
• `show protocols`

show system

Description Shows information about the system.

Syntax `show system`

Example Show system information, including installed languages (supported locales):

```
# show system
System Information
-----
System Name: Storage-1
System Contact: J. Smith
System Location: Main lab
System Information: Used for order processing data
Vendor Name: vendor
Product ID: product
Product Brand: brand
SCSI Vendor ID: vendor-ID
Enclosure Count: 2
Health: OK
Supported Locales: English
```

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 Provisioning

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 five 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
```

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

Last Used Snapshot

For a task whose replication mode is *last-snapshot*, the name of the last snapshot used for replication; 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 most recent existing snapshot of the primary volume.

Last Created

Name of the last volume created by the task, or blank

For an EnabledDSD task:

Task Name

Task name, which must be `taskDSDresume`

Task Type

`EnabledDSD`

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 DisabledDSD task:

Task Name

Task name, which must be `taskDSDsuspend`

Task Type

`DisabledDSD`

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	<i>SN</i>
----------	-----------

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

Last Used Snapshot

For a task whose replication mode is *last-snapshot*, the name of the last snapshot used for replication; 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 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 most recent existing snapshot of the primary volume.

Last Created

Name of the last volume created by the task, or blank

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	<i>SN</i>
----------	-----------

Task Name: taskDSDresume
Task Type: EnabledDSD
Status: Ready
Task State: Start
Error Message:

Task Name: taskDSDsuspend
Task Type: DisabledDSD
Status: Ready
Task State: Start
Error Message:

- See also**
- `create schedule`
 - `create task`
 - `delete task`
 - `set task`
 - `show schedule-details`
 - `show schedules`
 - `show task-details`

show users

Description Shows configured user profiles.

Syntax show users [*user*]

Input user
Optional. User name to show settings for.

Output Username
User name

Role

- monitor: View-only access to selected user interfaces
- manage: Modify access to selected user interfaces

User Type
The user's level of technical expertise: Novice, Standard, Advanced, or Diagnostic. All user types have access to all commands.

User Locale
Display language for this user

WBI
x indicates user can use the web-browser interface

CLI
x indicates user can use the command-line interface

FTP
x indicates user can use the file transfer protocol interface

Example Show configured users:

# show users					
Username			Roles	User Type	User Locale
WBI	CLI	FTP			

ftp			manage,monitor	Standard	English
		x			
manage			manage,monitor	Standard	English
x	x	x			
monitor			monitor	Standard	English
x	x				

See also • [create user](#)
• [delete user](#)
• [set user](#)

show vdisks

Description Shows information for all or specified vdisks.

Syntax `show vdisks [vdisks]`

Parameters *vdisks*

Optional. Names or serial numbers of the vdisks to show information about. For vdisk syntax, see [Command syntax](#) on page 19.

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: The vdisk is online, however some disks are down and the vdisk is not fault-tolerant
- FTDN: The vdisk is online and fault-tolerant, however some of the disks are down
- FTOL: The vdisk is online and fault-tolerant
- OFFL: The vdisk is offline because it is using offline initialization, or because disks are down and data may be lost
- QTCR: The vdisk is in a critical state and has been quarantined because some disks are missing
- QTOF: The vdisk is offline and has been quarantined because some disks are missing
- UNKN: The vdisk is shut down (stopped)
- UP: The vdisk is online and does not have fault-tolerant attributes

Jobs

Shows whether a job is running and its percent complete.

- EXPD: Vdisk is being expanded
- INIT: Vdisk is initializing
- RCON: Vdisk is being reconstructed
- VRFY: Vdisk is being verified
- VRSC: Vdisk is being scrubbed

Serial Number
Vdisk serial number

Drive Spin Down
Shows whether drive spin-down is enabled for the vdisk

Spin Down Delay
Shows the number of minutes after which the vdisk and its dedicated spares automatically spin down

Example Show information about all vdisks:

```
# show vdisks
```

Name	Size	Free	Own	Pref	RAID	Disks	Spr	Chk	Status	Jobs
Serial Number						Drive Spin Down				Spin Down Delay
VD1	587.1GB	116.7GB	B	B	RAID50	6	0	128k	FTOL	VRSC 41%
SN						Disabled			0	
VD2	146.5GB	95.7GB	A	A	RAID0	2	0	64k	UP	
SN						Enabled - all spinning	1			

- See also**
- `create vdisk`
 - `delete vdisks`
 - `expand vdisk`
 - `set vdisk`

show vdisk-statistics

Description Shows performance statistics for all or specified vdisks.

Syntax `show vdisk-statistics [vdisk]`

Parameters *vdisk*

Optional. Names or serial numbers of the vdisks to show information about. For vdisk syntax, see [Command syntax](#) on page 19. If this parameter is omitted, information is shown for all vdisks.

Output 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.

Example Show 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
VD1	SN	0B	0
55	47	1942.5KB	585.7KB
MyVdisk	SN	0B	0
...			

See also

- [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#	Destination volume serial number
Vdisk	Destination vdisk name
Source Volume	Source volume name
Progress	Percent complete of the volume copy
Status	Indicates whether the destination volume is Unavailable or Suspended
Status-Reason	The status is Unavailable while the volume-copy is in progress. The status is Suspended if the source volume goes offline while the copy is in progress. When the source volume comes back online, the copy process resumes from the point where it stopped.

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

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 19. 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

LUN
LUN used to access the volume

Access
Type of host access to the volume:

- read-write
- read-only
- no-access
- not-mapped

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
Info: Retrieving data...
Volume View [Serial Number (SM) Name (v1) ] Mapping:
  Ports      LUN   Access      Host-Port-Identifier Nickname
-----
  A0,A1,B0,B1 501   read-write   all other hosts

Volume View [Serial Number (SM) 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
```

- 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`

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
-----
```

See also • [show volume-maps](#)
• [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 19.

`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 19.

Output `Vdisk`
Name of the vdisk

`Name`
Name of the volume

`Size`
Volume size

`Serial Number`
Volume serial number

`WR Policy`
Write-back cache mode (write-back or write-through)

`Cache Opt`
Read-ahead cache mode (standard or super-sequential)

`Read Ahead Size`

- Disabled
- Default
- Maximum
- Specific size

Type

- `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 sourceProxy`: Destination of an in-progress replication from a remote volume, which when complete will change to type `snapshot`
- `unknown`: Unknown

Class

Standard, PTSNAP (snapshot-related), or unknown

Qualifier

RSR (replication-related) or N/A

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
-----
VD1 V1 20.0GB SN write-back standard Default
standard standard N/A
-----
```

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
-----
VD1 V1 35.9GB SN write-back standard Default
standard standard N/A
VD1 V2 35.9GB SN write-back standard Default
master volume PTSNAP RSR
VD1 V3 35.9GB SN write-back standard Default
snap-pool PTSNAP N/A
VD1 V4 35.9GB SN write-back standard Default
snapshot PTSNAP N/A
-----
```

See also

- [create volume](#)
- [delete volumes](#)
- [expand volume](#)
- [set volume](#)
- [show vdisks](#)
- [show volume-maps](#)

show volume-statistics

Description Shows performance statistics for all or specified volumes.

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 19. 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.

Write Cache Hits

(API only) Number of times the block written to is found in cache.

Write Cache Misses

(API only) Number of times the block written to is not found in cache.

Write Cache Hits

(API only) Number of times the block to be read is found in cache.

Write Cache Misses

(API only) Number of times the block to be read is not found in cache.

Small Destages

(API only) Number of times flush from cache to disk is not a full stripe.

Full Stripe Write Destages

(API only) Number of times flush from cache to disk is a full stripe.

Read-Ahead Operations

(API only) Number of read pre-fetch or anticipatory-read operations.

Write Cache Space

(API only) Cache size used on behalf of this volume.

Write Cache Percentage

(API only) Percentage of cache used on behalf of this volume.

Example Show statistics for volume vd1_v001:

```
# show volume-statistics vd1_v001
Volume Statistics
-----
Name: vd1_v001
Serial Number: SN
Bytes per second: 0B
IOPS: 0
Number of Reads: 110
Number of Writes: 15
Data Read: 651.7KB
Data Written: 61.4KB
```

See also

- `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...
```

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 remote system. The process to move a secondary volume is:

1. In the primary system:
 - 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.
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 19.

Example Start vdisks vd2 and vd1, which respectively contain a snap pool and the associated secondary volume:

```
# start vdisk vd2
Success: Command completed successfully.

# start vdisk vd1
Success: Command completed successfully.
```

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 remote system. The process to move a secondary volume is:

1. In the primary system:
 - 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.
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 `Shut down` and its status is shown as `UNKN`.

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 19.

Example Stop vdisks `vd1` and `vd2`, which respectively contain a secondary volume and its snap pool:

```
# stop vdisk vd1
Success: Command completed successfully.

# stop vdisk vd2
Success: Command completed successfully.
```

See also • [detach replication-volume](#)
• [reattach replication-volume](#)
• [show vdisks](#)
• [start vdisk](#)

stty

Description Sets and shows terminal information. Not supported in this release.

suspend replication

Description Suspends the current replication operation on the specified replication 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 replication 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 replication volume. If the name is not unique across replication sets, specify the `set` parameter.

Example Suspend replication on replication volume MV2:

```
# suspend replication MV2
Success: Replication Suspended.
```

See also • `abort replication`
 • `resume replication`
 • `show replication-sets`
 • `show replication-volumes`

test

Description Sends a message to test event notification. After issuing this command, verify that the test message reached the configured destinations.

Syntax `test email|snmp|notification`

Parameters `email`

Sends a test message to the configured email addresses.

`snmp`

Sends a test message to the configured SNMP trap hosts.

`notification`

Sends a test message to the configured email addresses and SNMP trap hosts.

Example Test email and SNMP notification of events:

```
# test notification
```

```
Success: Command completed successfully. - The test event was sent.
```

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.

△ **CAUTION:** This command can cause unstable operation and data loss if used improperly. It is intended for disaster recovery only.

The trust command resynchronizes the time and date stamp and any other metadata on a bad disk. This makes the disk an active member of the vdisk again. You might need to do this when a vdisk is offline because a disk is failing, you have no data backup, and you want to try to recover the data from the vdisk. In this case, trust may work, but only as long as the failing disk continues to operate.

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.

Syntax To enable the trust command:

```
trust enable
```

To trust a vdisk:

```
trust vdisk vdisk
```

Parameters *enable*
Enables the trust command before use.

vdisk vdisk

Name or serial number of the vdisk to trust. For vdisk syntax, see [Command syntax](#) on page 19.

Example Enable the trust command and then trust vdisk VD1:

```
# trust enable
Trust Virtual-disk Enabled.

# trust vdisk VD1
Are you sure? yes
Virtual-disk VD1 has been trusted.
```

See also • [show vdisks](#)

unmap volume

Description Deletes an explicit mapping whose settings override a volume's default mapping. When the explicit mapping is deleted, host access to the volume is controlled by the volume's default mapping (described in help for [create volume](#)).

Syntax `unmap volume`
 `[host host]`
 `volume`

Parameters `host host`
Optional. For FC and SAS, the host's nickname or 16-hex-digit WWPN. For iSCSI, the iSCSI host initiator's node name (typically the IQN) or nickname. If this parameter is omitted, mapping changes apply to all hosts not explicitly mapped.

`volume`

Name or serial number of the volume to unmap. For volume syntax, see [Command syntax](#) on page 19.

Example Unmap volume V1 from host Host1:

```
# unmap volume host Host1 V1
Success: Command completed successfully. - The volume(s) were unmapped
successfully.
```

Unmap volume V2's default mapping (leaving explicit mappings unchanged):

```
# unmap volume V2
Success: Command completed successfully. - The volume(s) were unmapped
successfully.
```

See also • [map volume](#)
 • [show host-maps](#)
 • [show hosts](#)
 • [show volume-maps](#)
 • [show volumes](#)

verify remote-link

Description Verifies that the local system can communicate with a specified remote system. The remote system must already have been added by using the `create remote-system` command.

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 links.

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.

`Remote Links`
IDs of linked ports on the remote system.

Example Verify all links between two FC-only systems:

```
# verify remote-link remote-system System2
Port Type Remote Links
-----
A1 FC A1,B1
B1 FC A1,B1
-----
```

Verify only iSCSI links between two FC/iSCSI systems:

```
# verify remote-link remote-system System2 link-type iSCSI
Port Type Remote Links
-----
A3 iSCSI A3,B3
B3 iSCSI A3,B3
-----
```

See also • `show remote-systems`

verify vdisk

Description Verifies whether vdisk redundancy data is consistent with its user data. For RAID 3, 5, 6, and 50, verify checks all parity blocks to find data-parity mismatches. For RAID 1 and 10, verify compares the primary and secondary disks to find data inconsistencies.

Verification can last over an hour, depending on vdisk size, utility priority, and amount of I/O activity. When verification is complete, the number of inconsistencies found is reported with event code 21 (`Vdisk verification complete`) in the event log. Such inconsistencies can indicate that a disk in the vdisk is going bad. You can use a vdisk while it is being verified.

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 19.

`fix yes|no`

Optional. Specifies to verify data in the vdisk and to fix any parity errors by making parity match the data in all cases. For details about using this parameter, including the required pass code, see the topic about resolving scrub errors in the Event Descriptions Reference Guide.

Example Verify vdisk vd1:

```
# verify vdisk vd1
```

```
Info: Command completed successfully. (vd1) - The verify was started on vdisk vd1.
```

See also • [abort verify](#)
• [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
-----
...
```

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 the minimum snap-pool size, whichever is larger. Before creating or scheduling copies, verify that the vdisk has enough free space to contain the snap pool.

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 and I/O is occurring to it.

To ensure the integrity of a copy of a master volume, either unmount 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 OSs, it is recommended to unmount temporarily. The volume copy is for all data on the disk at the time of the request, so if there is data in the OS cache, that will not be copied over. The unmount forces the cache flush from the OS. After the volume copy has started, it is safe to remount the volume and/or resume I/O.

To ensure the integrity of a copy of a snapshot with modified data, either unmount 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. If modified write data is not to be included in the copy, then you may safely leave the snapshot mounted. 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 19.

`dest-vdisk vdisk`

Name or serial number of the destination vdisk. For vdisk syntax, see [Command syntax](#) on page 19.

`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 the source volume from host operating systems 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 19.

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.

```
# 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: Snap pool spV1 was created.

Info: Volume V1 was converted to a master volume.

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.

See also

- [abort volumecopy](#)
- [create task](#)
- [show vdisks](#)
- [show volumecopy-status](#)
- [show volumes](#)

A Settings changed by restore defaults

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

Table 8 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 • Debug • In-band SES	• Enabled • Enabled • Enabled • Enabled • Enabled • Enabled • Enabled • Disabled • Enabled
Users	All configured users are deleted and replaced with default user definitions and default settings: • User: <code>manage</code>; password: <code>!manage</code> • User: <code>monitor</code>; password: <code>!monitor</code> • User: <code>ftp</code>; password: <code>!ftp</code> • Temperature scale: <code>Celsius</code> • 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 settings	(preserved) ⁵
SNMP settings:	
• SNMP • SNMP filter • SNMP trap host IPs • SNMP read community • SNMP write community	• Disabled • none • 0.0.0.0 • public • private

Table 8 Settings changed by restore defaults (continued)

Setting	Value
SMTP settings:	
• Email notification	• Disabled
• Email notify filter	• (none)
• Email addresses	• (none)
• Email server	• (none)
• Email domain	• (none)
• Email sender	• (none)
SSL/SSH certificates	(preserved) ⁶
Licenses	(preserved)
Vdisk metadata	(preserved)
Host port settings:	
• FC link speed	• Auto
• FC topology	• Loop
Host names	(preserved) ⁷
Drive spin down	Disabled
Advanced settings:	
• Vdisk background scrub	• Disabled
• Partner firmware upgrade	• Enabled
• Utility priority	• High
• SMART	• (preserved) ⁸
• Dynamic spare configuration	• Disabled
• Enclosure polling rate	• 5 seconds
• Supercap failure	• Enabled
• CompactFlash failure	• Enabled
• Auto write back	• Enabled
• Disk background scrub	• 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.
dual-port disk	A disk that is connected to both controllers so its data path is fault-tolerant.
dynamic spare	A properly sized available 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.
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.
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 when its metadata says the disk is a member of a vdisk but other members' metadata say the disk isn't a member. The metadata must be cleared before the disk can be used in a new vdisk or as a spare.
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 local system to a volume in one or more remote systems by moving the data contained within individual point-in-time snapshots from a local system to one or more remote systems via Fibre Channel or iSCSI links. The capability to perform remote replication is a licensed feature (AssuredRemote).
replication image	A replication image is a snapshot that contains the data for a specific point in time for a replication set's primary volume, as viewed by any volume in the replication set. All snapshots with the same image ID contain the exact same data, and therefore represent the same replication image.
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 image-stabilized snapshot that is taken explicitly for the purposes of replication. This snapshot cannot be mounted for access by hosts and is not counted against snapshot licensing. Its sole purpose is for use in the replication process. This snapshot is typically used as a replication sync point. A replication snapshot can be converted to a regular, licensed snapshot.
replication sync point	A snapshot that exists on the primary volume and has been successfully replicated to a secondary system.
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. A single-port disk's type is shown as SAS-S or SATA-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).
SSD	Solid-state drive. Supported SSDs have a SATA interface.

ULP	Unified LUN Presentation. A RAID controller feature that enables a host to access mapped volumes through any controller host port.
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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