Hewlett Packard Enterprise

HPE StorCLI User Guide

Abstract

This document includes tool command syntax, logging and task information for HPE StorCLI users. It is intended for users with a good working knowledge of storage hardware and configuration of logical drives and arrays. Hewlett Packard Enterprise assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

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Overview

The Storage Command Line Interface (StorCLI) tool is the command line management software designed for the MegaRAID product line. The StorCLI tool is a command line interface that is designed to be easy to use, consistent, and easy to script. This chapter provides information on how to install and use the StorCLI tool and explains the various features of the StorCLI tool.

NOTE
The legacy commands are deprecated from this guide.

Common Branding and Terminology

NOTE

Some of the commands, arguments, and error messages listed in this guide might not be applicable to all users because these are generic commands and only run depending on the type of controller that is used, the features enabled for a particular controller, the storage environment that you configure, and so on.

The table that follows details the most common MegaRAID and StorCLI terminologies and their equivalent or corresponding ProLiant/Hewlett Packard Enterprise terminologies.

Table 1: Common Branding and Terminology

MegaRAID/StorCLI Terminology	ProLiant/Hewlett Packard Enterprise Terminology
Broadcom	HPE
Avago	HPE
LSI	HPE
Avago 9361-24I RAID Controller	HPE Smart Array P824i-p MR Gen10 Controller
Broadcom 9361-24I RAID Controller	HPE Smart Array P824i-p MR Gen10 Controller
Drive Group	Array
DG	Array
Span	Parity Group
Drive Slot	Drive Bay
Energy Pack	HPE Smart Storage Battery
Supercap	HPE Smart Storage Battery
Reconstruction	Transformation
TTY Log	Serial Log/Serial Log Output
Virtual Drive	Logical Drive
VD	Logical Drive/LD
PD	Drive
Hot Spare	Spare Drive

Installation

The following table provides a list of supported controllers and operating systems.

Table 2: Operating Systems Support Matrix

Operating System	Version/Flavors
Supported Controllers	• HPE MR416i-p Gen11 • HPE MR416i-o Gen11 • HPE MR216i-p Gen11 • HPE MR216i-o Gen11 • HPE MR408i-o Gen11 • HPE MR416i-p Gen10+ • HPE MR416i-a Gen10+ • HPE MR216i-p Gen10+ • HPE MR216i-a Gen10+ • HPE Smart Array P824i-p MR Gen10 Controller.
Supported operating systems	**Microsoft** • Microsoft Windows Server 2022 (LTSC) • Microsoft Windows Server 2019 (LTSC) **Linux** • Red Hat Enterprise Linux 9.1 • Red Hat Enterprise Linux 9.0 • Red Hat Enterprise Linux 8.7 • Red Hat Enterprise Linux 8.6 • Red Hat Enterprise Linux 8.5 • SUSE Linux Enterprise Server 15 SP5 • SUSE Linux Enterprise Server 15 SP4 • SUSE Linux Enterprise Server 15 SP3 • SUSE Linux Enterprise Server 12 SP5 • SUSE Linux Enterprise Server 12 SP4 • SUSE Linux Enterprise Server 12 SP3 **Ubuntu** • Ubuntu 22.04 LTS • Ubuntu 20.04 LTS **VMware** • VMware vSphere 8.0 • VMware vSphere 7.0 U3 c • VMware vSphere 7.0 U2 • VMware vSphere 7.0 U1

NOTE
When installing StorCLI on a Linux or Ubuntu operating system, the StorCLI binary is installed in the `/opt/MegaRAID/` directory.

Installing the StorCLI Tool on Microsoft Windows Operating Systems

The Windows StorCLI binary file is provided in a binary format, and no separate installation is required.

1. Copy the binary file from the CD or from the company website.
2. Place the binary file in the directory from which you want to run the StorCLI tool, and run the tool.

   NOTE
   You must run the StorCLI tool using the administrator privileges.

   Because Windows PowerShell is not fully supported by the StorCLI tool, use either one of the following techniques to run commands in the StorCLI tool in a Windows PowerShell:

   - Enclose commands in double quotes.
     For example,
     `storcli "/cx show"`
   - Launch the command prompt from within the Windows PowerShell to run the StorCLI commands.

Installing the StorCLI Tool on Linux Operating Systems

To install the StorCLI tool on Linux operating systems, perform the steps that follow:

1. Unzip the StorCLI tool package.
2. To install the StorCLI RPM feature, run the `rpm -ivh <StorCLI-x.xx-x.noarch.rpm>` command.
3. To upgrade the StorCLI RPM feature, run the `rpm -Uvh <StorCLI-x.xx-x.noarch.rpm>` command.
4. To upgrade Storcli deb package, run the `dpkg -i <storcli_xx.xx.xx.xx_all.deb>` command.
5. The StorCLI binary is installed in the `/opt/MegaRAID/` directory.

   NOTE

   Upgrading the Linux RPM or deb packages from any version lower or equal to 007.2204.0000.0000 to any version higher or equal to 007.2206.0000.0000, may result in the warning`remove failed: No such file or directory`.

   This error occurs due to the installation path change and can be ignored. To avoid the warning, uninstall the older package and then install the latest package.

Installing the StorCLI Tool on VMware Operating Systems

To install the StorCLI tool on a VMware operating system, run the command that follows from the command line:

```
esxcli software vib install -v=<path-to-vib-package>
```

For example:

```
esxcli software vib install -v=/vmfs/volumes/datastore1/StorCliMN/vmware-esx-StorCli-1.01.04.vib
```

Uninstalling the StorCLI Tool on VMware Operating Systems

To uninstall the StorCLI tool on a VMware operating system, run the command that follows from the command line:

```
esxcli software vib remove -n=<StorCLI package name>
```

StorCLI Tool Command Syntax

This chapter describes the StorCLI command syntax and the valid values for each parameter in the general command syntax.

NOTE
In large configurations, running two instances of the StorCLI tool at the same time is not recommended.

The StorCLI tool syntax uses the following general format:

```
<[object identifier]> <verb> <[adverb | attributes | properties]> <[key=value]>
```

The StorCLI tool supports the object identifiers listed in the table that follows.

Table 3: Object Identifiers in the StorCLI Command Syntax

Object Identifier	Description
No object identifier specified	If no object identifier exists, the command is a system command.
/c*x*	This object identifier is for controller *x*.
/call	This object identifier is for sending the command to all controllers.
/c *x*/v *x*	This object identifier is for a virtual drive *x* on controller *x*.
/c *x*/vall	This object identifier is for all virtual drives on controller *x*.
/c*x*/e*x*	This object identifier is for an enclosure *x* on controller *x*.
/c*x*/eall	This object identifier is for all enclosures on controller *x*.
/c*x*/fall	This object identifier is for all foreign configurations on controller *x*.
/c*x*/lnx	This is the object identifier for the lane speed *x* on controller *x*
/c*x*/e*x*/s*x*	This object identifier for the drive is slot *x* on enclosure *x* on controller *x*.
/c*x*/s*x*	This object identifier represents the drives that are directly attached to controller *x*.
/call/sall	This object identifier represents all the drives that are directly attached to all controllers.
/c*x*/e*x*/sall	This object identifier is for all the drives on enclosure *x* on controller *x*.
/c*x*/d*x*	This object identifier is for the drive group *x* on enclosure *x* on controller *x*.
/c*x*/dall	This object identifier is for the all drive groups on enclosure *x* on controller *x*.
/c*x*/p*x*	This object identifier is for a phy operation *x* on controller *x*.
/c*x*/pall	This object identifier is for all phy operations on controller *x*.
/c*x*/bbu	This object identifier is for a BBU on controller *x*.
/c*x*/cv	This object identifier is for a CacheVault on controller *x*.
/c*x*/mx	This object identifier is a MUX identifier, cache vault *x* on controller *x*.

NOTE
If enclosures are not used to connect physical drives to the controller, you do not specify the enclosure ID in the command.

The StorCLI tool supports the verbs that follow.

Table 4: Verbs in the StorCLI Command Syntax

Verb	Description
`add`	This verb adds virtual drives, JBODs, and so on to the object identifier.
`compare`	This verb compares an input value with a system value.
`del` / `delete`	This verb deletes a drive, value, or property of the object identifier.
`download`	This verb downloads and flashes a file to the target.
`expand`	This verb expands the size of the virtual drive.
`erase`	This verb erases a particular region on the controller, depending on the argument specified.
`flush`	This verb flushes a controller cache or a drive cache.
`flasherase`	This verb erases the flash memory on the controller.
`get`	This verb obtains the data from the controller.
`import`	This verb imports the foreign configuration into the drive.
`insert`	This verb replaces the configured drive that is identified as missing, and starts an automatic rebuild.
`pause`	This verb pauses an ongoing operation.
`resume`	This verb resumes paused operation.
`restart`	This verb restarts the controller without a system reboot.
`set`	This verb sets a value of the object identifier.
`show`	This verb shows the value and properties of the object identifier.
`split`	This verb enables you to perform a break mirror operation on a drive group.
`suspend`	This verb suspends a particular operation that is being performed.
`start`	This verb starts an operation.
`stop`	This verb stops an operation that is in progress. A stopped process cannot be resumed.
`spinup`	This verb spins up the drives connected to the controller.
`spindown`	This verb spins down an unconfigured drive and prepares it for removal.
`shutdown`	This verb shuts down the controller.
`secure erase`	This verb erases the lock key of a secure drive.
`transform`	This verb downgrades the firmware memory on the controller.

- `<[adverb | attributes | properties]>`
  Specifies what the verb modifies or displays.
- `<[key=`*`value`*`]>`
  Specifies a value, if a value is required by the command.

StorCLI Default Logging

Default logging functionality has been enabled in StorCLI. When a default log file is created, the file is saved as `storcli.log` . Each time default logging occurs, the information is added to the `storcli.log` . Once the log file reaches a maximum size of 3 MB, a new log file is created. There can be up to four log files at any given time. The following example shows four log files:

- `storcli.log`
- `storcli.log.1`
- `storcli.log.2`
- `storcli.log.3`

Due to default logging, there is a space limitation in light operating systems such as VMware or UEFI.

> **NOTE**
> StorCLI default logging requires a minimum of 20 MB of free space.

There are two conditions under which StorCLI logging occurs:

- When the `storcliconf.ini` file is present in the same directory as the StorCLI binary.
  Logging happens to the file name specified in the `ini` file. This is useful in situations where default logging will not work.
  For example, a segmentation fault occurs or a crash happens in StorCLI binary. In these situations, collect a StorCLI log file by placing the `storcliconf.ini` file in the same working directory as StorCLI.
- When the `storcliconf.ini` file is not present in the same working directory as StorCLI binary.
  Default logging occurs automatically.

Use the `nolog` option to disable logging for any command.

For example, include the `nolog` option in the `storcli /cx show nolog` command to prevent default logging.

StorCLI Commands

The StorCLI tool is a command line utility tool. The StorCLI tool is not case sensitive. The order in which you specify the command options should be the same as in this document; otherwise, the commands might fail.

Abbreviations used in the StorCLI command line options are not changed.

StorCLI does not support the Snapshot feature.

> **NOTE**
> Some of the commands, arguments, and error messages listed in this guide might not be applicable to all the users as these are generic commands and only execute depending on the type of the controller that is being used, the features that are enabled for a particular controller, the storage environment that a user is using, and so on.

This section describes the commands supported by the StorCLI tool.

System Commands

System Show Commands

The Storage Command Line Interface (StorCLI) tool supports the following system `show` commands:

```
storcli show
storcli show all
storcli show ctrlcount
storcli show help
storcli -v
```

The detailed description for each command follows.

storcli show

This command shows a summary of controller and controller-associated information for the system. The summary includes the number of controllers, the host name, the operating system information, and an overview of the existing configuration.

storcli show all

This command shows the list of controllers and controller-associated information, information about the drives that need attention, and advanced software options.

storcli show ctrlcount

This command shows the number of controllers detected in the server.

storcli show help

This command shows help for all commands at the server level.

storcli -v

This command shows the StorCLI tool version.

Controller Commands

Controller commands provide information and perform actions related to the specified controller, such as the `/c0` controller. The StorCLI tool supports the controller commands described in this section.

Show and Set Controller Properties Commands

Controller commands provide information and perform actions related to the specified controller, such as the `/c0` controller. The Storage Command Line Interface Tool supports the controller commands described in this section.

Table 5: Controller Commands Quick Reference Table

Commands	Value Range	Description
`show <properties>`	See Table 6	Shows specific controller properties.
`set <properties>`	See Table 6	Sets controller properties.
`show`	`all` : Shows all properties of the virtual drive. `freespace` : Shows the free space in the controller. See Controller Show Commands.	Shows physical drive information.

NOTE
You cannot set multiple properties with a single command.

storcli /cx show <property>

This command shows the current value of the specified property on the specified controller.

General example output:

```
Status Code = 0
Status = Success
Description = None
Controller: 0
Property_name = Property_value
```

You can show the following properties using the `storcli /cx show <property1>|<property2>` command.

```
storcli /cx show abortcconerror
storcli /cx show activityforlocate
storcli /cx show alarm
storcli /cx show autoconfig
storcli /cx show autorebuild
storcli /cx show backplane
storcli /cx show badblocks
storcli /cx show batterywarning
storcli /cx show bgirate
storcli /cx show bios
storcli /cx show bootdrive
storcli /cx show bootwithpinnedcache
storcli /cx show cachebypass
storcli /cx show cacheflushint
```

```
storcli /cx show captureSodPlLogs
storcli /cx show ccrate
storcli /cx show coercion
storcli /cx show consistencycheck|cc
storcli /cx show copyback
storcli /cx show deviceorderbyfirmware
storcli /cx show directpdmapping
storcli /cx show DPM
storcli /cx show driveactivityled
storcli /cx show ds
storcli /cx show eccbucketleakrate
storcli /cx show eccbucketsize
storcli /cx show eghs
storcli /cx show failpdonsmarterror
storcli /cx show flushwriteverify
storcli /cx show foreignautoimport
storcli /cx show freespace
storcli /cx show htbparams
storcli /cx show immediateio
storcli /cx show jbod
storcli /cx show largeiosupport
storcli /cx show linkconfig
storcli /cx show loadbalancemode
storcli /cx show maintainpdfailhistory
storcli /cx show migraterate
storcli /cx show ncq
storcli /cx show ocr
storcli /cx show oob
storcli /cx show overrideSlowArrayThresholds
storcli /cx show parityreadcachebypass
storcli /cx show patrolread|pr
storcli /cx show pci
storcli /cx show pdspindownatshutdown
storcli /cx show perfmode
storcli /cx show perfmodevalues
storcli /cx show personality
storcli /cx show perst
storcli /cx show pi
storcli /cx show powermonitoringinfo
storcli /cx show prcorrectunconfiguredareas
storcli /cx show profile
storcli /cx show prrate
storcli /cx show rebuildrate
storcli /cx show reconrate
storcli /cx show rehostinfo
```

```
storcli /cx show restorehotspare
storcli /cx show refClk
storcli /cx show safeid
storcli /cx show sesmonitoring
storcli /cx show sesmultipathcfg
storcli /cx show sgpioforce
storcli /cx show smartPollDAinterval
storcli /cx show smartpollinterval
storcli /cx show spinupdelay
storcli /cx show spinupdrivecount
storcli /cx show SGPIOforce
storcli /cx show temperature
storcli /cx show termlog [type=config|contents] [logfile[=filename]]
storcli /cx show time
storcli /cx show tracenumber
storcli /cx show unmap
storcli /cx show usefdeonlyencrypt
storcli /cx show wbsupport
```

storcli /cx set <property> = <value>

General example output:

```
Status Code = 0
Status = Success
Description = None
Controller 0, new Property_name = Property_value
```

The following commands are examples of the properties that can be set using the `storcli /cx set <property>=<value>` command:

```
storcli /cx set abortcconerror=<on|off>
storcli /cx set activityforlocate=<on|off>
storcli /cx set autoconfig < none | JBOD >
storcli /cx set autorebuild=<on|off>
storcli /cx set batterywarning=<on|off>
storcli /cx set bgirate=<value>
storcli /cx set bios [state=<on|off>] [mode=<soe|pe|ie|sme>] [abs=<on|off>]
storcli /cx set bootwithpinnedcache=<on|off>
storcli /cx set backplane [mode=<0-3>][expose=<on|off>]
storcli /cx set cachebypass=<on|off>
storcli /cx set cacheflushinterval=<value>
storcli /cx set captureSodPlLogs=<on|off>
storcli /cx set ccrate=<value>
storcli /cx set coercion=<value>
storcli /cx set consistencycheck|cc=[off|seq|conc][delay=value] [starttime=yyyy/mm/dd hh] [excludevd=x-
y,z|None ]
storcli /cx set copyback=<on|off> type=<smartssd|smarthdd|all>
```

storcli /c*x* set debug reset all

storcli /c*x* set debug type=<*value*> option=<*value*> [level=<*value in hex*>]

storcli /c*x* set deviceorderbyfirmware=<on|off>

storcli /c*x* set directpdmapping=<on|off>

storcli /c*x* set driveactivityled=<on|off>

storcli /c*x* set ds [properties]

storcli /c*x* set ds=off type=1|2|3|4

storcli /c*x* set ds=on type=1|2 [properties]

storcli /c*x* set ds=on type=3|4 defaultldtype=<val> [properties]

storcli /c*x* set eccbucketleakrate=<*value*>

storcli /c*x* set eccbucketsize=<*value*>

storcli /c*x* set eghs [state=<on|off>] [eug=<on|off>] [smarter=<on|off>]

storcli /c*x* set factory defaults

storcli /c*x* set foreignautoimport=<on|off>

storcli /c*x* set failpdonsmarterror=<on|off>

storcli /c*x* set flushwriteverify=<on|off>

storcli /c*x* set htbparams=off

storcli /c*x* set htbparams [= on] maxsize=<value> minsize=<value> decrementsize=<value>

storcli /c*x* set immediateio=<on|off>

storcli /c*x* set jbod=<on|off>

storcli /c*x* set largeiosupport=<on|off>

storcli /c*x* set linkconfig [conname=cx,cy] configid=<*value*>

storcli /c*x* set loadbalancemode=<*value*>

storcli /c*x* set maintainpdfailhistory=<on|off>

storcli /c*x* set ncq=<on|off>

storcli /c*x* set ocr=[on|off]

storcli /c*x* set oob mode=i2c|pcie maxpayloadsize=<payloadsize> maxpacketsize=<packetsize> [spdm=on|off] [pldm=on|off]

storcli /c*x* set overrideSlowArrayThresholds=<on|off> [force]

storcli /c*x* set parityreadcachebypass=<on|off>

storcli /c*x* set patrolread|pr {=on mode=<auto|manual>}|{off}

storcli /c*x* set pdspindownatshutdown {[sashdd=<on|off>] [satahdd=<on|off>] [sasssd=<on|off>] [satassd=<on|off>] [nvmessd=<on|off>]}

storcli /c*x* set perfmode=<value> [maxflushlines=<value> numiostoorder=<value>]

storcli /c*x* set perst=0|1|2

storcli /c*x* set pi [state=<on|off>] [import=<on|off>]

storcli /c*x* set prcorrectunconfiguredareas=<on|off>

storcli /c*x* set profile profileid=<id>

storcli /c*x* set prrate=<*value*>

storcli /c*x* set rebuildrate=<*value*>

storcli /c*x* set reconrate=<value>

storcli /c*x* set restorehotspare=<on|off>

storcli /c*x* set security spdm slotgroup=xx slot=yy invalidate [force]

storcli /c*x* set sesmultipathcfg=<on|off>

storcli /c*x* set smartpollinterval=<*value*>

```
storcli /cx set smartPollDAInterval=<value>
storcli /cx set spinupdelay=<value>
storcli /cx set spinupdrivecount=<value>
storcli /cx set stoponerror=<on|off>
storcli /cx set supportssdpatrolread=<on|off>
storcli /cx set SGPIOforce=<on|off>
storcli /cx set sesmonitoring=[on|off]
storcli /cx set time=yyyymmdd hh:mm:ss|systemtime
storcli /cx set termlog[=on|off|offthisboot]
storcli /cx set unmap=<on|off>
storcli /cx set updatevpd file=<filepath>
storcli /cx set usefdeonlyencrypt=[on|off]
```

The table that follows lists and describes the properties for the `show` and `set` commands.

Table 6: Properties for Show and Set Commands

Property Name	Set Command Range	Description
abortcconerror	on|off	Aborts a consistency check when it detects an inconsistency.
activityforlocate	on|off	Enables or disables drive activity, drive activity locates functions for systems without SGPIO/SES capabilities.
alarm	=[on|off|silence]	Enables (`on`) or disables (`off`) the alarm on critical errors. The option `silence` silences the alarm. This option is supported only on MegaRAID controllers that have a physical buzzer. If set to `on` , the alarm sounds on critical errors. If set to `off` , any active alarms are silenced and the alarm will not sound on any errors, including critical errors. If set to `silence` , any currently sounding alarm stops, but starts again after a reboot if another critical error is present and the alarm is `on` .
aso	deactivatetrialkey	Displays the enabled Advanced Software Options.
aso	key=<*key value*>	
aso	key=<*key value*> preview	
aso	rehostcomplete	
aso	transfertovault	
assemblynumber	=<*xxxx*>	—
autoconfig	none | JBOD	Sets the behavior to `JBOD` or `none` .
autorebuild	on|off	—

Property Name	Set Command Range	Description
bgirate	0 to 100	Sets background initialization rates in percentages.
backplane mode	0 : Use autodetect logic of backplanes, such as SGPIO and I^2C SEP using GPIO pins. 1 : Disable autodetect SGPIO. 2 : Disable I^2C SEP autodetect. 3 : Disable both the autodetects.	Configures enclosure detection on a non-SES/expander backplane.
backplane expose	on|off	Enables or disables device drivers to expose enclosure devices; for example, expanders, SEPs.
batterywarning		
cachebypass	on|off	Enables or disables the cache bypass performance improvement feature.
cacheflushint	0 to 255, default value 4	Sets cache flush interval in seconds.
captureSodPlLogs	on|off	Sets the start of the day PL logs capture settings.
ccrate	0 to 100	Sets consistency check rate in percentage.
coercion	0 : No coercion 1 : 128 MB 2 : 1 GB	Sets drive capacity in coercion mode.
consistencycheck	See Consistency Check Commands.	See Consistency Check Commands.
copyback	on|off type = smartssd|smarthdd|all smartssd : Copy back enabled for SSD drives. smarthdd : Copy back enabled for HDD drives. all : Copy back enabled for both SSD drives and HDD drives. Example: storcli /cx set copyback=on type=all	Enables or disables copy back for drive types.
directpdmapping	on|off	Enables or disables direct physical drive mapping. When enclosures are used, this feature is disabled; otherwise it should be enabled.
driveactivityled	on|off	Activate or deactivate the Drive Activity LED.
eccbucketleakrate	0 to 65535	Sets the leak rate of the single-bit bucket in minutes (one entry removed per leak-rate).
eccbucketsize	0 to 255	Sets the size of ECC single-bit-error bucket (logs event when full).
eghs	eug=[on|off]	Enables (on) or disables (off) the commissioning of Unconfigured Good drives as Emergency Hot Spare (EHSP) drives.

Property Name	Set Command Range	Description
eghs	smarter=[on|off]	Enables (on) or disables (off) the commissioning of Emergency Hot Spare (EHSP) drives for Predictive Failure (PFA) events.
eghs	state=[on|off]	Enables (on) or disables (off) the commissioning of otherwise incompatible global hot spare drives as Emergency Hot Spare (EHSP) drives.
factory defaults	—	—
foreignautoimport	on|off	Imports a foreign configuration automatically, at boot.
failpdonsmarterror	on|off	Enables or disables the *Fail PD on SMARTer* property.
flushwriteverify	=[on|off]	Enables or disables the Write Verify feature. This feature verifies if the data was written correctly to the cache before flushing the controller cache.
flushwriteverify	on|off	—
HDDThermalPollInterval	=<*value*>	—
htbparams	=off	Disables posting the HTB at the time of the driver load.
htbparams	For maxsize , the value range is 128–65535. For minsize , the value range is 0–65535. For decrementsize , the value range is 0–255.	Sets the HTB parameters to the given values. To enable posting of HTB during driver load, the maximum size, minimum size, and decrement size has to be set. maxsize : Maximum host trace buffer size in KB. minsize : Minimum host trace buffer size in KB. For decrementsize : Host trace buffer decrement size in KB.
immediateio	on|off	Enables or disables Immediate I/O transactions.
jbod	on|off	Enables or disables JBOD mode; by default, drives become system drives. Not supported by all controllers. **Note:** If you try to disable the JBOD mode, and if any of the JBODs has an operating system/file system, the StorCLI tool displays a warning message that indicates the JBOD has an operating system or a file system on it and prompts you to use the force option to proceed with the disable operation.
jbodwritecache	=[on|off|default]	—
largeiosupport	=[on|off]	—

Property Name	Set Command Range	Description
largeQD	=[on|off]	—
ldlimit	=[default|max]	—
limitMaxRateSATA	=[on|off]	—
linkconfig	[connname=c*x*,c*y*] linkconfig=<*val*>	—
loadbalancemode	on|off	Enables or disables automatic load balancing between SAS phys or ports in a wide port configuration.
maintainpdfailhistory	on|off	Maintains the physical drive fail history.
maintenance	mode=[normal|nodevices]	—
migraterate	0 to 100	Sets data migration rate in percentage.
ocr	on|off	Displays the online conroller reset ocr status.
overrideSlowArray Thresholds	on|off force	This command allows the user to enable or disable the slow array logic. Slow array logic ensures both slow and fast RAID volumes can coexist without impacting overall system performance.
parityreadcachebypass	on|off	Sets the parityreadcachebypass .
patrolread	[starttime=<*yyyy/mm/dd hh*>] pr	—
patrolread	=[[on mode=[auto|manual]]|[off]] pr	—
patrolread	[maxconcurrentpd =<value>] | [includessds=<on|onlymixed|off>] |[uncfgareas=on|off] |[excludevd=x-y,z|none] |[delay = <value>]delay = <*value*>	—
pdfaileventoptions	[detectionType=<*val*>] [correctiveaction=<*val*>] [errorThreshold=<*val*>]	—
pdspindownatshutdown	[sashdd=<on|off>] [satahdd=<on|off>] [sasssd=<on|off>] [satassd=<on|off>] [nvmessd=<on|off>]	Sets controllers Spindown control for PDs at shutdown.
perfmode	=<value> [maxflushlines=<*value*> numiostoorder=<*value*>]	—
perfmode	=0 : Tuned to provide the best IOPs, currently applicable to non-FastPath. =1 : Tuned to provide the least latency, currently applicable to non-FastPath.	Performance tuning setting for the controller.
personality	=[RAID|HBA|JBOD]	Sets the personality to RAID , JBOD , or HBA . If you switch personalities, you must reboot the system for the changes to take effect.

Property Name	Set Command Range	Description
perst	=0|1|2	Sets the PERST setting of the controller. • 0 : Default. The PERST signal is managed by the I/O Unit (no override). • 1 : Enable. The PERST signal is always deasserted. • 2 : Disable. The PERST signal is always asserted.
pi	=[on|off]	Enables (on) or disables (off) Protection Information (sometimes called data protection) support on the controller.
pi	import=[on|off]	Enables (on) or disables (off) import data protection drives on the controller.
prcorrectunconfiguredareas	on|off	Correct media errors during PR by writing 0s to unconfigured areas of the disk.
profile	profileid=<*id*>	Sets the profile ID. **Note:** Valid profile values (set using profileid=option) differ for each MR controller model and firmware version; consult the applicable MegaRAID controller user guide and release notes document for supported profileid values.
prrate	0 to 100	Sets the patrol read rate of the virtual drives in percentage.
rebuildrate	0 to 100	Sets the rebuild rate of the drive in percentage.
reconrate	0 to 100	Sets the reconstruction rate for a drive, as a percentage.
restorehotspare	on|off	Becomes a hot spare on insertion of a failed drive.
refClk	=0|1|2	This command sets the PCIe reference clock settings of the controller.
sasadd	= <*xxxx*> [devicename] [methodport]	• 0 – Default. The PCIe reference clock is managed by the I/O Unit. • 1 – Enable. The PCIe reference clock is always enabled. • 2 – Disable. The PCIe reference clock is always disabled.
sasaddhi	= <*xxxx*> [devicename] [methodport]	—
sasaddlow	= *xxxxx* [devicename] [methodport]	—

Property Name	Set Command Range	Description
securitykey	=<*xxxxxxxx*> [passphrase=<*xxxx*>] [keyid=<*xxx*>] [VolatileKey=<*xxx*>]	—
securitykey	keyid=<*xxx*>	—
securitykey	=[on|off]	Enables (on) or disables (off) SES monitoring.
sesmonitoring	on|off	Enables or disables SES monitoring.
SGPIOforce	=[on|off]	Forces the SGPIO status per port only for four drives; affects high performance computing (HPC) controllers.
smartpollinterval	0 to 65535	Set the time for polling of SMART errors, in seconds.
smartPollDAInterval	0 to 65535	Sets the controller Smartpoll interval for direct-attached drives.
spinupdrivecount	0 to 255	Sets the number of drives that are spun up at a time.
spinupdelay	0 to 255	Sets the spin-up delay between a group of drives or a set of drives, in seconds.
SSDThermalPollInterval	=<*value*>	—
stoponerror	on|off	Stops the MegaRAID BIOS during power-on self-test (POST), if any errors are encountered.
supportssdpatrolread	=[on|off]	Enables (on) or disables (off) patrol read for SSD drives.
supportssdpatrolread	on|off	Enables or disables patrol read for SSD drives.
SGPIOforce	on|off	Forces the SGPIO status per port only for four drives; affects HPC controllers.
termlog	on | off | offthisboot offthisboot : Disables the termlog flush to ONFI only for this boot. In the next boot, the termlog will be enabled.	Enables or disables the termlog to be flushed from DDR to ONFI. The offthisboot option disables the termlog flush to ONFI only for this boot. In the next boot, the termlog is enabled.
time	Valid time in *yymmdd hh:mm:ss* format or systemtime	Sets the controller time to your input value or the system time (local time in 24-hour format).
tracenumber	= <*xxxx*>	—
updatevpd	file= <*filepath*>	—
usefdeonlyen	=[on|off]	Enables (on) or disables (off) FDE drive-based encryption.

Controller Show Commands

The StorCLI tool supports the following `show` commands:

```
storcli /cx show
storcli /cx show all [noASO] [noforeign] [logfile[=filename]]
storcli /cx show freespace
```

The detailed description for each command follows.

storcli /cx show

This command shows the summary of the controller information. The summary includes basic controller information, foreign configurations, drive groups, virtual drives, physical drives, and information on enclosures.

Input example:

```
storcli /c1 show
```

storcli /cx show all [noASO] [noforeign] [logfile[=filename]]

The `show all` command shows all of the controller information, which includes basic controller information, bus information, controller status, advanced software options, controller policies, controller defaults, controller capabilities, scheduled tasks, miscellaneous properties, foreign configurations, drive groups, virtual drives, physical drives, and enclosure information.

If the option `noASO` is given in the command, it excludes the Advanced Software Options and Safe ID details from the output.

If you use the `logfile` option in the command syntax, the logs are written to the specified file. If you do not specify a file name, then the logs are written to the `storsas.log` file. If you do not use the `logfile` option in the command syntax, the entire log output is printed to the console.

If the option `noforeign` is given in the command, it excludes the foreign configuration details from the output.

Do not use spaces in between file names.

Input examples:

```
storcli /c0 show all [logfile[=log.txt]]
storcli /c0 show all logfile = abc.txt
```

> **NOTE**
> The PCI information displayed as a part of `storcli /cx show` and `storcli /cx show all` commands is not applicable for the FreeBSD operating system. Hence, the PCI information fields are displayed as `N/A`.

storcli /cx show freespace

This command shows the usable free space in the controller.

Input example:

```
storcli /c0 show freespace
```

Controller Debug Commands

The StorCLI tool supports the following debug commands:

Syntax

```
storcli /cx  set debug type = <value> option = <value> level = [<value in hex>]
```

This command enables the firmware debug variables.

Where:

- `/cx` – Specifies the controller where *x* is the index of the controller.
- `type` – Takes the value from 0 – 128, mapping each number to a particular debug variable in the firmware.
- `option` – Takes the value from 0 – 4, where;
  - `0` – NA
  - `1` – SET
  - `2` – CLEAR
  - `3` – CLEAR ALL
  - `4` – DEBUG DUMP
- `level` – Supports multiple levels of debugging in the firmware.

Syntax

```
storcli /cx set debug reset all
```

This command enables the firmware debug logs from the application

Where:

`/cx` – Specifies the controller where *x* is the index of the controller.

> **NOTE**
>
> The **debug type**, the **debug value**, and the **debug level** for the following debug commands are exclusively used by the MegaRAID Technical Support team to provide technical support. For assistance with these debug commands, contact an MegaRAID Technical Support representative.

Controller Background Tasks Operation Commands

Rebuild Rate Commands

The StorCLI tool supports the following rebuild rate commands:

```
storcli /cx set rebuildrate=<value>
storcli /cx show rebuildrate
```

The detailed description for each command follows.

storcli /cx set rebuildrate=<*value*>

This command sets the rebuild task rate of the specified controller. The input value is in percentage.

Input example:

```
storcli /c0 set rebuildrate=30
```

> **NOTE**
> A high rebuild rate slows I/O transaction processing.

storcli /cx show rebuildrate

This command shows the current rebuild task rate of the specified controller in percentage.

Input example:

```
storcli /c0 show rebuildrate
```

Patrol Read Commands

The StorCLI tool supports the following patrol read commands:

```
storcli /cx resume patrolread
storcli /cx set patrolread ={{on mode=<auto|manual>}|{off}}
storcli /cx set patrolread [starttime=<yyyy/mm/dd hh>] [maxconcurrentpd=<value>] [includessds=<on|off>]
 [uncfgareas=<on|off>] [excludevd=x-y,z|none]
storcli /cx set patrolread  delay=<value>
storcli /cx show patrolread
storcli /cx start patrolread
storcli /cx stop patrolread
storcli /cx pause patrolread
```

NOTE
A patrol read operation is scheduled for all the physical drives of the controller.

The detailed description for each command follows.

storcli /cx resume patrolread

This command resumes a suspended patrol read operation.

Input example:

```
storcli /c0 resume patrolread
```

storcli /cx set patrolread {=on mode=<auto|manual>}|{off}

This command turns on the patrol read scheduling and sets the mode of the patrol read operation to automatic or manual.

Input example:

```
storcli /c0 set patrolread=on mode=manual
```

storcli /cx set patrolread [starttime=<yyyy/mm/dd hh>] [maxconcurrentpd=<value>] [includessds=<on|off>] [uncfgareas=on|off] [excludevd=x-y,z|none]

This command schedules a patrol read operation. You can use the following options for patrol read command operations.

Table 7: Set Patrol Read Input Options

Option	Value Range	Description
starttime	A valid date and hour in 24-hour format	Sets the start time in *yyyy/mm/dd hh* format.
maxconcurrentpd	Valid number of physical drives present	Sets the number of physical drives that can be patrol read at a single time.
includessds	—	Include SSDs in the patrol read operation.

Option	Value Range	Description
uncfgareas	—	Regardless of the uncfgareas option status (on|off), the patrol read operation always scans the entire physical drive. However, if uncfgareas=on , the patrol read operation corrects the media error in the unconfigured area of the physical drive. If uncfgareas=off , the patrol read operation does not correct the media error in the unconfigured area of the physical drive.
excludevd	The range should be less than the number of virtual drives or none.	Excludes virtual drives from the patrol read. To exclude particular virtual drives, provide a list of virtual drive IDs (x,y, z format) or the range of virtual drives that you want to exclude from a patrol read (x-y format). If this option is not specified in the command, then no virtual drives are excluded. If None is specified, any virtual drives that were previously excluded, are removed.

NOTE
Controller time is taken as a reference for scheduling a patrol read operation.

Input example:

```
storcli /c0 set patrolread=on starttime=2012/02/2100
```

storcli /cx set patrolread [delay=<value>]

This command delays the scheduled patrol read in hours.

Input example:

```
storcli /c0 set patrolread delay=30
```

storcli /cx show patrolread

This command shows the current state of the patrol read operation along with other details, such as the **PR Mode**, **PR Execution Delay**, **PR iterations completed**, and **PR on SSD**. This command also shows the start time and the date when the patrol read operation started.

The values shown for the current state of the patrol read operation are **Ready**, **Active**, **Paused**, **Aborted**, **Stopped**, or **Unknown**.

If the state of the patrol read operation is active, a numeric value is shown along with the state which depicts the number of physical drives that have completed the patrol read operation. As an example, Active 1 means that the one physical drive has completed the patrol read operation.

Input example:

```
storcli /c0 show patrolread
```

storcli /cx start patrolread

This command starts the patrol read operation. This command starts a patrol read operation immediately.

Input example:

```
storcli /c0 start patrolread
```

storcli /cx stop patrolread

This command stops a running patrol read operation.

Input example:

```
storcli /c0 stop patrolread
```

> **NOTE**
> You cannot resume a stopped patrol read operation.

storcli /cx pause patrolread

This command pauses a running patrol read operation.

Input example:

```
storcli /c0 pause patrolread
```

> **NOTE**
> You can run this command only when a patrol read operation is running on the controller.

Consistency Check Commands

The StorCLI tool supports the commands that follow to schedule, perform, and view the status of a consistency check (CC) operation:

```
storcli /cx set consistencycheck|cc=[off|seq|conc][delay=value] starttime=yyyy/mm/dd hh [excludevd=x-y,z| None]
storcli /cx show cc
storcli /cx show ccrate
```

The detailed description for each command follows.

storcli /cx set consistencycheck|cc=[off|seq|conc][delay=value] starttime=yyy/mm/dd hh [excludevd=x-y,z,none]

This command schedules a consistency check (CC) operation. You can use the following options with the consistency check command.

Table 8: Set Consistency Check Input Options

Option	Value Range	Description
cc	seq : Sequential mode. conc : Concurrent mode. off : Turns off the consistency check.	Sets CC to either sequential mode, or concurrent mode, or turns off the CC. The concurrent mode slows I/O processing.
delay	-1 and any integer value.	Delay a scheduled consistency check. The value is in hours. A value of 0 makes the CC run continuously with no delay (in a loop). Only scheduled consistency checks can be delayed.

Option	Value Range	Description
`starttime`	A valid date and hour in 24-hours format.	Start time of a consistency check is in *yyyy/mm/dd hh* format.
`excludevd`	The range should be less than the number of virtual drives.	Excludes virtual drives from the consistency checks. To exclude particular virtual drives, you can provide list of virtual drive names (Vx,V*y* … format) or the range of virtual drives that you want to exclude from a consistency check (Vx-V*y* format). If this option is not specified in the command, no virtual drives are excluded.

Input example:

```
storcli /c0 set CC=CONC starttime=2012/02/21 00 excludevd v0-v3
```

storcli /cx show cc

This command shows the consistency check schedule properties for a controller.

Input example:

```
storcli /c0 show cc
```

storcli /cx show ccrate

This command checks the status of a consistency check operation. The CC rate appears as a percentage.

Input example:

```
storcli /c0 show ccrate
```

> **NOTE**
> A high CC rate slows I/O processing.

Premium Feature Key Commands

The StorCLI utility supports the following commands for premium feature keys:

```
storcli /cx set aso key=<value> [preview]
storcli /cx show aso
storcli /cx set aso [transfertovault][rehostcomplete][deactivatetrialkey]
storcli /cx show safeid
```

The detailed description for the command follows.

storcli /cx set aso key=<value> [preview]

This command activates advanced software options (ASO) for a controller. You can use the following options with the advanced software options command.

Table 9: Set Advanced Software Options Input Options

Option	Value Range	Description
key	40 alphanumeric characters.	The key to activate the ASO on the controller. After they are activated, ASOs cannot be removed from the controller.
deactivatetrialkey	—	Deactivates any currently active trial key.
rehostcomplete	—	Enables rehosting on the specified controller.
transfertovault	—	Transfers the ASO key to the vault and disables the ASO.

Input example:

```
storcli /c0 set aso key=LSI0000
```

storcli /cx show safeid

This command shows the Safe ID of the specified controller.

Input example:

```
storcli /c0 show safeid
```

Controller Security Commands

The StorCLI utility supports the following controller security commands:

```
storcli /cx delete securitykey
storcli /cx set securitykey < keyid=xxx | file=filename >
storcli /cx set securitykey < =xxxxxxxx [passphrase=xxxx] [keyid=xxx] [VolatileKey=on|off] | file=filename >
storcli /cx set securitykey < =xxxxxxxx oldsecuritykey=xxxxxxxx [passphrase=xxxx] [keyid=xxx] [VolatileKey=on|
off] | file=filename >
storcli /cx show securitykey keyid
storcli /cx set securitykey useekms
```

The detailed description for each command follows.

storcli /cx compare securitykey < =xxxxxxxx | file=filename >

This command compares and verifies the security key of the controller.

storcli /cx delete securitykey

This command deletes the security key of the controller.

Input example:

```
storcli /c0 delete securitykey
```

storcli /cx set securitykey < keyid=xxx | file=filename >

This command sets the key ID for the controller. The key ID is unique for every controller.

storcli /cx set securitykey < =xxxxxxxx [passphrase=xxxx] [keyid=xxx] [VolatileKey=on|off] | file=filename >

This command sets the security key for the controller. You can use the following options with the `set security key` command.

Table 10: Set Security Key Input Options

Option	Value Range	Description
`passphrase`	Should have a combination of numbers, uppercase letters, lowercase letters, and special characters. Minimum of 8 characters and maximum of 32 characters.	A string that is linked to the controller and is used in the next bootup to encrypt the lock key. If `passphrase` is not set, the controller generates it by default.
`keyid`	—	The unique ID set for different controllers to help you specify a passphrase to a specific controller.
`volatileKey`	`on|off`	Used to create the key as a volatile (temporary) key.

Input example:

```
storcli /c0 set securitykey=Lsi@12345 passphrase=Lsi@123456 volatilekey=on keyid=1
```

storcli /cx set securitykey < =xxxxxxxx oldsecuritykey=xxxxxxxx [passphrase=xxxx] [keyid=xxx] [VolatileKey=on|off] | file=filename >

This command changes the security key for the controller.

Input example:

```
storcli /c0 set securitykey=Lsi@12345 oldsecuritykey=pass123 passphrase=Lsi@123456 volatilekey=on keyid=1
```

storcli /cx show securitykey keyid

This command shows the security key for the secured controller.

Input example:

```
storcli /c0/ show securitykey keyid
```

storcli /cx set securitykey useekms

This command sets the security key for the controller using EKMS.

Input example:

```
storcli /c0/ set securitykey useekms
```

Flashing Controller Firmware Command

The following command is used to *flash* the controller firmware.

```
storcli /cx download file=<filepath> [fwtype=<value>] [ResetNow] [nosigchk] [noverchk] [force] [forceclose]
```

The detailed description for the command follows.

storcli /cx download file=filepath [fwtype=<value>] [ResetNow] [nosigchk] [noverchk] [force] [forceclose]

This command flashes the firmware with the ROM file to the specified adapter from the given file location (*filepath* is the absolute file path).

You can use the options that follow in the table to flash the firmware:

Table 11: Flashing Controller Firmware Input Options

Option	Value Range	Description
`file`	`filepath`	The absolute file path.
`fwtype`	`0` : Application `1` : TMMC `2` : GG-Enhanced	The firmware type to be downloaded. The application downloads the firmware for the controller. The TMMC downloads the firmware for the TMMC battery only. Default is `0` (application).
`resetnow`	—	Invokes online firmware update on the controller; you do not need to reboot the controller to make the update effective. The `resetnow` option is not supported in the UEFI mode.
`nosigchk`	—	The application flashes the firmware even if the check word on the file does not match the required check word for the controller. You can damage the controller if a corrupted image is flashed using this option.
`noverchk`	—	The application flashes the controller firmware without checking the version of the firmware image. This option must be provided between phases to the downgrade firmware.
`[force]`	—	Advanced override feature for flashing the controller firmware under specific scenarios with guidance from Broadcom technical support.
`[forceclose]`	—	Used for calling the flash close before start of the FW download process.

Controller Cache Command

The command that follows flushes the controller cache.

```
storcli /cx flush|flushcache
```

The detailed description for the command follows.

storcli /cx flush|flushcache

This command flushes the controller cache.

Input example:

```
storcli /c0 flushcache
```

Controller Configuration Commands

The following commands work with the controller configuration.

```
storcli /cx set config file=log.txt
storcli /cx get config file=file_name
```

The detailed description for each command follows.

storcli /cx set config file=log.txt

This command restores the controller configuration and its properties from a specified file.

> **NOTE**
>
> You cannot load a saved configuration file over an existing configuration file when virtual drives already exist. You must first clear the configuration file on the target controller.

Input example:

```
storcli /c0 set config file=log.txt
```

storcli /cx get config file=file_name

This command saves the controller configuration and its properties to a specified file.

Input example:

```
storcli /c0 get config file=filename
```

Snapdump Commands

Snapshot dumping is a mechanism of saving a snapshot of the debug information at fault time. The intention is to collect all required information to be able to root-cause the defect at the first instance of defect detection. The Snapdump command makes sure that multiple defect reproductions are not required to debug.

storcli /cx get snapdump

Requests that the adapter generate a new snapdump, and download all the snapdumps present.

Input example:

```
storcli /cx get snapdump
```

SPDM Commands

StorCLI SPDM commands display the security protocol details and allow users to configure the security protocol on a controller. The SPDM commands allow users to view the security protocol version, slot status, export and import security protocol, and invalidate a slot.

```
storcli /cx show
storcli /cx show all
storcli /cx show security spdm slotgroup=xx slot=yy
storcli /cx export security spdm slotgroup=xx slot=yy subject=subjectname file=filename
storcli /cx import security spdm slotgroup=xx slot=yy file=filename [seal]
storcli /cx set security spdm slotgroup=xx slot=yy invalidate
storcli /cx get security spdm slotgroup=xx slot=yy file=filename
```

storcli /cx show

This command displays the security protocol support and security protocol properties detailed information.

storcli /cx show all

This command displays the security protocol information.

storcli /cx show security spdm slotgroup=xx slot=yy

This command reports the status of the certificate slot chain.

storcli /cx export security spdm slotgroup=xx slot=yy subject=subjectname file=filename

This command requests the firmware create a certificate signing request and return it. The firmware returns an error if the requested slot is already populated and sealed, if the slot group is invalid, or if the firmware cannot support the requested BaseAsymAlgo and BaseHashAlgo fields selected.

storcli /cx import security spdm slotgroup=xx slot=yy file=filename [seal]

This command supplies a certificate chain from the application to the firmware. The firmware returns an error if the requested slot and slot group fields do not match an open session.

storcli /cx set security spdm slotgroup=xx slot=yy invalidate

This command invalidates the certificate chain storage slot.

storcli /cx get security spdm slotgroup=xx slot=yy file=filename

This command reads the certificate from the chain storage slot and allows the users to validate a downloaded certificate chain.

Temperature Command

The StorCLI utility supports the following temperature command:

```
storcli /cx show temperature
```

The firmware continuously monitors the 12Gb/s MegaRAID controller temperature and takes corrective actions to prevent the thermal runaway condition. For example, if the temperature reaches beyond a certain limit the firmware adjusts the power consumption options, including reducing SAS links to a lower speed. The controller switches to a low-power mode when the temperature exceeds a certain limit. The controller reverts to full-power mode when the temperature is back within the specified temperature limit.

The temperature operation limit that is specified for the 12Gb/s MegaRAID controller is 115°C. The firmware defines 116°C as the higher threshold at which the thermal runaway condition in the chassis occurs. The firmware defines 104°C as the lower temperature threshold to revert to full-power mode.

storcli /cx show temperature

This command displays the temperature information of the controller if the respective hardware is present.

Input example:

```
storcli /c0 show temperature
```

Output example:

```
ROC temperature(Degree Celsius) = 64
Ctrl temperature(Degree Celsius) = 64
```

Diagnostic Command

The StorCLI utility supports the following diagnostic command:

```
storcli /cx start diag [duration=<val>]
```

IMPORTANT
The following diagnostic command is not supported for VMware EXSi.

The detailed description for the command follows.

storcli /cx start diag [duration=<val>]

This command runs the diagnostic self-check on the controller for the specified time period in seconds.

Input example:

```
storcli /c0 start diag duration=5
```

NOTE

Ensure no IOs are running while executing this command.

Drive Commands

This section describes the drive commands, which provide information and perform actions related to physical drives. The table that follows describes frequently used virtual drive commands.

Table 12: Physical Drives Commands Quick Reference Table

Commands	Value Range	Description
`set`	`missing` : Sets the drive status as missing. `good` : Sets the drive status to unconfigured good. `offline` : Sets the drive status to offline. `online` : Sets the drive status to online.	Sets physical drive properties.
`show`	`all` : Shows all properties of the physical drive. See Drive Show Commands.	Shows virtual drive information.

Drive Show Commands

The StorCLI tool supports the drive `show` commands that follow:

```
storcli /cx[/ex]/sx show
storcli /cx[/eall]/sall show
storcli /cx[/ex]/sx|sall show all
storcli /cx/[ex]/sx show smart
```

NOTE
If enclosures are used to connect physical drives to the controller, specify the enclosure ID in the command. If no enclosures are used, you must specify the controller ID and slot ID.

The detailed description for each command follows.

storcli /cx[/ex]/sx show

This command shows the summary of the physical drive for a specified slot in the controller.

Input example:

```
storcli /c0/e0/s4 show
```

storcli /cx[/eall]/sall show

This command shows the summary information for all the enclosures and physical drives connected to the controller.

Input example:

```
storcli /c0/eall/sall show
```

storcli /cx[/ex]/sx|sall show all

This command shows all information of a physical drive for the specified slot in the controller. If you use the `all` option, the command shows information for all slots on the controller. The x stands for a number, a list of numbers, a range of numbers, or all numbers.

This command also shows the NCQ (Native Command Queuing) status (**Enabled**, **Disabled**, or **N/A**) which is applicable only to SATA drives. If the controller to which the SATA drive is connected supports NCQ and NCQ is enabled on the SATA drive, the status is shown as **Enabled**; otherwise it is shown as **Disabled**. If NCQ is not a supported drive operation on the controller, the status is shown as **N/A**.

If the drive and the controller support wear gauge metrics, the command will display the Estimated Life Remaining in percentage and days.

Input examples:

```
storcli /c0/e3/s0-3 show all
storcli /c0/e35/sall show all
```

> **NOTE**
> The `storcli /cx/sx show all` command shows detailed drive information.

storcli /cx/[ex]/sx show smart

This command displays the SMART information of a SATA drive.

Input example:

```
storcli /c0/e5/s1 show smart
```

storcli /cx/ex/sx show errorcounters

If a faulty cable or a bad drive is found, this command displays the error counters for that specific faulty cable or a bad drive. If no drive is present, this command only displays error counters for a faulty cable.

Input example:

```
storcli /c0/e5/s1 show errorcounters
```

> **NOTE**
>
> Note that specifying `<ex>` or the enclosure index is optional.

storcli /cx/ex/sx reset errorcounters type=<1>|<2>

This command resets the drive/slot error counters.

- If you input the error counter type as `1` , this command resets the drive error counters.
- If you input the error counter type as `2` , this command resets the slot error counters.
- If no drive is present, this argument takes `2` as an input and resets only the slot error counters.

Input example:

```
storcli /c0/e5/s1 reset errorcounters type=1
```

NOTE

Note that specifying <e*x*> (the enclosure index) is optional.

Missing Drives Commands

The StorCLI tool supports the commands that follow to mark and replace missing physical drives:

```
storcli /cx[/ex]/sx set offline
storcli /cx[/ex]/sx set missing
storcli /cx[/ex]/sx insert dg=A array=B row=C
storcli /cx/dall
```

The detailed description for each command follows.

storcli /cx[/ex]/sx set offline

This command marks the selected drive in an array as offline.

NOTE
To set a drive that is part of an array as *missing*, first set it as offline. After the drive is set to offline, you can then set the drive to missing.

storcli /cx[/ex]/sx set missing

This command marks a drive as missing.

Input example:

```
storcli /c0/s4 set missing
```

storcli /cx[/ex]/sx insert dg=A array=B row=C

This command replaces the configured drive that is identified as missing, and then starts an automatic rebuild.

Input example:

```
storcli /c0/e25/s3 insert dg=0 array=2 row=1
```

storcli /cx/dall

This command is used to find the missing drives.

Set Drive State Commands

The StorCLI tool supports the commands that follow to set the status of physical drives:

```
storcli /cx[/ex]/sx set jbod
storcli /cx[/ex]/sx set good [force]
storcli /cx[/ex]/sx set offline
storcli /cx[/ex]/sx set online
storcli /cx[/ex]/sx set missing
storcli /cx[/ex]/sx set bootdrive=<on|off>
```

The detailed description for each command follows.

storcli /cx[/ex]/sx set jbod

This command sets the drive state to JBOD.

Input example:

```
storcli /c1/e56/s3 set jbod
```

storcli /cx[/ex]/sx set good [force]

This command changes the drive state to unconfigured good.

Input example:

```
storcli /c1/e56/s3 set good
```

> **NOTE**
>
> If the drive has an operating system or a file system on it, the StorCLI tool displays an error message and fails the conversion. If you want to proceed with the conversion, use the `force` option as shown in the command that follows.

Input example:

```
storcli /c1/e56/s3 set good [force]
```

storcli /cx[/ex]/sx set offline

This command changes the drive state to offline.

Input example:

```
storcli /c1/e56/s3 set offline
```

storcli /cx[/ex]/sx set online

This command changes the drive state to online.

Input example:

```
storcli /c1/e56/s3 set online
```

storcli /cx[/ex]/sx set missing

This command marks a drive as missing.

Input example:

```
storcli /c1/e56/s3 set missing
```

storcli /cx[/ex]/sx set bootdrive=<on/off>

This command sets or unsets a physical drive as a boot drive.

Input example:

```
storcli /c1/e56/s3 set bootdrive=on
```

Drive Initialization Commands

When you initialize drives, all the data from the drives is cleared. The StorCLI tool supports the commands to initialize drives:

```
storcli /cx[/ex]/sx show initialization
storcli /cx[/ex]/sx start initialization
storcli /cx[/ex]/sx stop initialization
```

The detailed description for each command follows.

storcli /cx[/ex]/sx show initialization

This command shows the current progress of the initialization progress in percentage.

The estimated time (in minutes) left to complete the operation is also shown.

Input example:

```
storcli /c0/e31/s4 show initialization
```

storcli /cx[/ex]/sx start initialization

This command starts the initialization process on a drive.

Input example:

```
storcli /c0/e31/s4 start initialization
```

storcli /cx[/ex]/sx stop initialization

This command stops an initialization process running on the specified drive. A stopped initialization process cannot be resumed.

Input example:

```
storcli /c0/e56/s1 stop initialization
```

NVMe Drive Commands

The StorCLI utility supports the following NVMe drive commands.

```
storcli /cx show failedNvmeDevices
storcli /cx[/ex]/sx show repair
storcli /cx[/ex]/sx start repair [force]
storcli /cx[/ex]/sx stop repair
```

storcli /cx show failedNvmeDevices

This command displays the list of initialization failed NVMe drives.

Syntax

```
storcli /cx show failedNvmeDevices
```

storcli /cx[/ex]/sx show repair

This command displays the NVMe drive repair status.

Syntax

```
storcli /cx[/ex]/sx show repair
```

storcli /cx[/ex]/sx start repair [force]

This command starts the repair process on the requested drive.

Syntax

```
storcli /cx[/ex]/sx start repair [force]
```

Force – Deletes all data present on the drive.

storcli /cx[/ex]/sx stop repair

This command stops the repair of the requested NVMe drive.

Syntax

```
storcli /cx[/ex]/sx stop repair
```

> **NOTE**
> If NVMe failed drives are detected, the controller state will move to `Need Attention`.

Drive Firmware Download Commands

The StorCLI tool supports the commands that follow to download the drive firmware:

```
storcli /cx[/ex]/sx download src=<filepath> [satabridge] [mode= 5|7] [parallel [force]] [chunksize=<val>]
storcli /cx[/ex]/sx download status
storcli /cx[/ex]/sx download src=<filepath> mode=E [offline] [activatenow] [delay=<val>] [chunksize=<val>]
storcli /cx[/ex]/sx download mode=F [offline]
[delay=<val>]
```

> **NOTE**
> For Broadcom MegaRAID controllers that do not have DDR memory, Mode 7 is the only reliable way to perform drive firmware download. Using Mode 5 can lead to unpredictable results due to a lack of resources that are required to support such operations.

The detailed description for each command follows.

storcli /cx[/ex]/sx download src=<filepath> [satabridge] [mode= 5|7] [parallel [force]] [chunksize=<val>]

This command flashes the drive firmware with the specified file.

The `satabridge` option lets you download the SATA bridge firmware in online mode.

The `mode` options specify the SCSI write buffer mode. The description follows:

- `5` – The entire drive firmware file is downloaded at once.
- `7` – The drive firmware file is downloaded in 32KB chunks.
- `chunksize` – The chunksize is in KB and the default is 32 KB.

> **NOTE**
> The default mode is `7`.

Input example:

```
storcli /c0/e56/s1 download src=c:\file1.bin
```

Input example:

```
storcli /c0/e56/s1 download src=c:\file1.bin mode=5
```

storcli /cx[/ex]/sx download src=<filepath> mode= E [offline] [activatenow [delay=<val>]] [chunksize=<val>

storcli /cx[/ex]/sx download mode= F [offline] [delay=<val>]

These commands support the drive firmware download using `Mode E` and `Mode F`. The mode options specify the `SCSI WRITE BUFFER` mode.

The description follows:

- **Mode E** – Downloads the microcode and lets you issue this command for multiple devices.
  You can only use `Mode E` in an offline mode.
- **Mode F** – Activates the deferred microcode and lets you issue this command to all devices in a safe manner.
  You can only use this in an offline mode. You cannot issue this command before issuing the `Mode E` command. The default delay time is `15` seconds. You can specify any delay time between `1` to `300` seconds.

  NOTE

  You can download as well as activate the drive firmware by executing the `activatenow` command in the same command line. You can also specify the delay time, but the delay time specified by you is applicable only for activation and not for downloading the drive firmware.

  For NVMe drive firmware updates, Mode 5 and Mode 7 will not work on lower MDTS drives. Use Mode E for NVMe drive firmware updates if the update fails with Mode 5 or Mode 7.

Input examples for Mode E:

```
storcli /c0/e0/s0 download src=file.rom mode=E offline
```

Download successful.

```
storcli /c0/e0/sall download src=file.rom mode=E offline
```

Downloaded sequentially on the drives.

Input Examples for Mode F:

```
storcli /c0/e0/sall download mode=F offline
```

Activation of the microcode successful

```
Storcli /c0/e0/sall download mode=F offline delay=15
```

Activation completed with a 15-second delay.

Drive Firmware Update through Parallel HDD Microcode

MegaRAID provides an interface to update the drive firmware in both online and offline modes through host applications, such as StorCLI. Using the parallel HDD microcode update feature, firmware updates can be performed simultaneously on multiple HDDs of the same family in an online mode. Also, the parallel HDD microcode update overcomes the VD tolerance level. You can use the parallel HDD microcode update feature to update up to eight devices at the same time. It is recommended to perform the parallel HDD microcode update in system maintenance mode.

The parallel HDD microcode update is not supported in the following scenarios:

- If a physical drive firmware download is already in progress on any physical drive.
- If Pinned Cache is present on the controller.
- Online firmware upgrade is not supported if `FEATURE SET` value is enabled for `DEFAULT` and disabled for `LOW COST` .

> **NOTE**
> For Broadcom MegaRAID controllers that do not have DDR memory, Mode 7 is the only reliable way to perform drive firmware download. Using mode 5 can lead to unpredictable results due to a lack of resources that are required to support such operations.

Command Usage Examples

```
storcli /c0/ex/sall download src=drv_fw.lod [mode=5/7] [parallel] [force]
storcli /c1/e1/sall download src=drivefirmware.lod mode=5 parallel
```

Where:

- `c` – Controller number
- `x` – The index of either the controller or the enclosure
- `e` – Enclosure number
- `s` – Slot number
- `sall` – All drives
- `parallel` – Indicates firmware update is performed in parallel mode
- `force` – Indicates whether you want to force this operation

storcli /c0/e1/sall download status

This command provides the current firmware download status on the specified drive list.

Locate Drives Commands

The StorCLI tool supports the commands that follow to locate a drive and activate the physical disk activity LED:

```
storcli /cx[/ex]/sx start locate
storcli /cx[/ex]/sx stop locate
```

The detailed description for each command follows.

storcli /cx[/ex]/sx start locate

This command locates a drive and activates the drive's LED.

Input example:

```
storcli /c0/e56/s1 start locate
```

storcli /cx[/ex]/sx stop locate

This command stops a locate operation and deactivates the drive's LED.

Input example:

```
storcli /c0/e56/s1 stop locate
```

Prepare to Remove Drives Commands

The StorCLI utility supports the following commands to prepare the physical drive for removal:

```
storcli /cx/ex/sx spindown
storcli /cx/ex/sx spinup
```

The detailed description for each command follows.

storcli /cx/ex/sx spindown

This command spins down an unconfigured drive and prepares it for removal. The drive state is unaffiliated, and it is marked offline.

Input example:

```
storcli /cx/e25/s4 spindown
```

storcli /cx/ex/sx spinup

This command spins up a spun-down drive and the drive state is unconfigured good.

Input example:

```
storcli /c0/e25/s4 spinup
```

> **NOTE**
> The `spinup` command works on a physical drive only if the user had previously issued a `spindown` command on the same physical drive.

Drive Security Command

The StorCLI utility supports the following drive security commands:

```
storcli /cx[/ex]/sx set securitykey=on
storcli /cx[/ex]/sx show securitykey keyid
```

storcli /cx[/ex/]sx show securitykey keyid

This command shows the security key for secured physical drives.

Input example:

```
storcli /c0/e25/s4 show SecurityKey keyid
```

storcli /cx[/ex/]sx set security=on

This command sets the security on the FDE-capable JBOD drive.

Input example:

```
storcli /c0/e25/s4 set security=on
```

Drive Secure Erase Commands

The StorCLI utility supports the following drive erase commands:

```
storcli /cx[/ex]/sx secureerase [force]
storcli /cx[/ex]/sx show erase
storcli /cx[/ex]/sx start erase [simple|normal|crypto|thorough] [patternA=<value1>] [patternB=<value2>]
storcli /cx[/ex]/sx stop erase
```

The detailed description for each command follows.

storcli /cx[/ex]/sx secureerase [force]

This command erases the drive's security configuration and securely erases data on a drive. You can use the `force` option as a confirmation to erase the data on the drive and the security information.

Input example:

```
storcli /c0/e25/s1 secureerase
```

> **NOTE**
> This command deletes data on the drive and the security configuration, and this data is no longer accessible. This command is used for SED drives only.

storcli /cx[/ex]/sx show erase

This command provides the status of erase operation on non-SED drives.

Input example:

```
storcli /c0/e25/s1 show erase
```

storcli /cx[/ex]/sx start erase [simple|normal|thorough|crypto|standard] [patternA=<val1>] [patternB=<val2>]

> **NOTE**
> The erase option is supported only on UG drives and is not supported on JBOD drives.

This command securely erases non-SED drives. The drive is written with erase patterns to make sure that the data is securely erased. You can use the following options with the `start erase` command.

Table 13: Drive Erase Command Options

Options	Value Range	Description
`erase`	`simple` : Single pass, single pattern write `normal` : Three pass, three pattern write `thorough` : Nine pass, repeats the normal write three times `crypto` : Performs cryptographic erase for SSD drives	Secures erase type.
`patternA`	8-bit value	Erases pattern A to overwrite the data.
`patternB`	8-bit value	Erases pattern B to overwrite the data.

Input example:

```
storcli /c0/e25/s1 start erase thorough patternA=10010011 patternB=11110000
```

Rebuild Drives Commands

The commands that follow rebuild drives in the StorCLI tool:

```
storcli /cx[/ex]/sx pause rebuild
storcli /cx[/ex]/sx resume rebuild
storcli /cx[/ex]/sx show rebuild
storcli /cx[/ex]/sx start rebuild
storcli /cx[/ex]/sx stop rebuild
```

NOTE
If enclosures are used to connect physical drives to the controller, specify the enclosure ID in the command.

The detailed description for each command follows.

storcli /cx[/ex]/sx pause rebuild

This command pauses an ongoing rebuild process. You can run this command only for a drive that is currently rebuilt.

Input example:

```
storcli /c0/s4 pause rebuild
```

storcli /cx[/ex]/sx resume rebuild

This command resumes a paused rebuild process. You can run this command only when a paused rebuild process for the drive exists.

Input example:

```
storcli /c0/s4 resume rebuild
```

storcli /cx[/ex]/sx show rebuild

This command shows the progress of the rebuild process in percentage.

The estimated time (in minutes) left to complete the operation is also shown.

Input example:

```
storcli /c0/s5 show rebuild
```

storcli /cx[/ex]/sx start rebuild

This command starts a rebuild operation for a drive.

Input example:

```
storcli /c0/s4 start rebuild
```

storcli /cx[/ex]/sx stop rebuild

This command stops a rebuild operation. You can run this command only for a drive that is currently rebuilt.

Input example:

```
storcli /c0/s4 stop rebuild
```

Drive Copyback Commands

The StorCLI tool supports the commands that follow for drive copyback operations:

```
storcli /cx[/ex]/sx pause copyback
storcli /cx[/ex]/sx resume copyback
storcli /cx[/ex]/sx show copyback
storcli /cx[/ex]/sx start copyback target=eid:sid
storcli /cx[/ex]/sx stop copyback
```

The detailed description for each command follows.

NOTE
In the copyback commands, `cx[/ex]/sx` indicates the source drive and `eid:sid` indicates the target drive.

NOTE
When a copyback operation is enabled, the alarm continues to beep even after a rebuild is complete; the alarm stops beeping only when the copyback operation is completed.

storcli /cx[/ex]/sx pause copyback

This command pauses a copyback operation. You can run this command only when a copyback operation is running.

Input example:

```
storcli /c0/e25/s4 pause copyback
```

storcli /cx[/ex]/sx resume copyback

This command resumes a paused copyback operation. You can run this command only when a paused copyback process exists for the drive.

Input example:

```
storcli /c0/e25/s4 resume copyback
```

storcli /cx[/ex]/sx show copyback

This command shows the progress of the copyback operation as a percentage.

The estimated time (in minutes) left to complete the operation is also shown.

Input example:

```
storcli /c0/e25/s4 show copyback
```

storcli /cx[/ex]/sx start copyback target=eid:sid

This command starts a copyback operation for a drive.

Input example:

```
storcli /c0/e25/s4 start copyback target=25:8
```

storcli /cx[/ex]/sx stop copyback

This command stops a copyback operation. You can run this command only on drives that have the copyback operation running.

Input example:

```
storcli /c0/e25/s4 stop copyback
```

NOTE
A stopped rebuild process cannot be resumed.

Hot Spare Drive Commands

The commands that follow create and delete hot spare drives:

```
storcli /cx[/ex]/sx add hotsparedrive {dgs=<n|0,1,2...>}[enclaffinity]
storcli /cx/[ex]/sx delete hotsparedrive
```

NOTE
If enclosures are used to connect the physical drives to the controller, specify the enclosure ID in the command.

The detailed description for each command follows.

storcli /cx[/ex]/sx add hotsparedrive [{dgs=<*n*|0,1,2...>}] [enclaffinity]

This command creates a hot spare drive. You can use the following options to create a hot spare drive.

Table 14: Add Hot Spare Drive Input Options

Option	Value Range	Description
dgs	Valid drive group number	Specifies the drive group to which the hot spare drive is dedicated.
enclaffinity	Valid enclosure number	Specifies the enclosure with which the hot spare is associated. If this option is specified, affinity is set; if it is not specified, no affinity exists. Affinity cannot be removed after it is set for a hot spare drive.

Input example:

```
storcli /c0/e3/s4,5 add hotsparedrive
```

This command sets the /c0/e3/s4,5 drives as global hot spare drives.

Input example:

```
storcli /c0/e3/s6,8 add hotsparedrive dgs=0,1
```

This command sets /c0/e3/s6,8 drives as dedicated hot spare for disk groups 0 and 1.

storcli /cx/[ex]/sx delete hotsparedrive

This command deletes a hot spare drive.

Input example:

```
storcli /c0/e3/s4,5 delete hotsparedrive
```

Drive Predictive Failure Monitoring Commands

The StorCLI tool supports the commands that follow for drive predictive failure monitoring:

```
storcli /cx show pdfailevents [lastoneday] [fromSeqNum=xx] [file=filename]
storcli /cx set pdfaileventoptions detectiontype=val correctiveaction=val errorrthreshold=val
```

The detailed description for each command follows.

storcli / cx show pdfailevents[lastoneday][fromSeqNum=xx][file=filename]

This command shows all of the drive predictive failure events.

Input example 1:

```
storcli /c0 show pdfailevents
```

This command shows all of the drive predictive failure events from the oldest sequence number.

Input example 2:

```
storcli /c0 show pdfailevents lastoneday
```

This command shows all of the drive predictive failure events that occurred in the last 24 hours.

Input example 3:

```
storcli /c0 show pdfailevents fromSeqNum
```

This command shows all of the drive predictive failure events generated from the specified sequence number.

> **NOTE**
> While running these commands, if you provide a file name, the events are written to the specified file as values separated by commas.

storcli / cx set pdfaileventoptions detectiontype=val correctiveaction=val errorrthreshold=val

This command provides the current settings of the `pdfaileventoptions` set on the controller and the various options to change these settings.

Input example 1:

```
storcli /c0 set pdfaileventoptions detectiontype=x
```

Where:

- `00b` = Detection disabled
- `01b` = Detection enabled, high latency for read operations is OK
- `10b` = Detection enabled, aggressive (high latency for read operations is not OK)
- `11b` = Detection enabled, use NVDATA specified value, see `recoveryTimeLimit` and `writeRetryCount`

This command sets the detection type for the drive. The valid range is 0 to 3.

> **NOTE**
> For the changes to take effect, a reboot is required.

Input example 2:

```
storcli /c0 set pdfaileventoptions correctiveaction=x
```

Where:

- `0` = Only log events
- `1` = Log events, take corrective action based on SMARTer.

This command sets the corrective actions to be taken when the media error is detected. The valid value is 0 or 1.

Input example 3:

```
storcli /c0 set pdfaileventoptions errorrthreshold=x
```

Where:

- `00b – 1` = One error every 8 hours (least tolerant)
- `01b – 8` = One error every 1 hour
- `10b – 32` = One error every 15 minutes
- `11b – 90` = One error every 5 minutes (most tolerant of drive with degraded media)

This command sets the error threshold for the controller. The valid range is 0 to 3.

Drive Sanitize Commands

The StorCLI tool supports the drive sanitize commands that follow:

```
storcli /cx[/ex]/sx start sanitize [cryptoerase|overwrite|blockerase] [ause]
storcli /cx[/ex]/sx show sanitize
storcli /cx[/ex]/sx start sanitize overwrite [ause] [invert] [overwritecount=<val>] [ patternA=<val>
 patternB=<val> patternC=<val> patternD=<val> ]
```

The detailed description for each command follows.

storcli /cx/ex/sx start sanitize [cryptoerase| overwrite | blockerase] [ause]

This command lets you erase the data that resides on a physical drive. You can use the sanitize type arguments that follow with the `start sanitize` command:

- `cryptoerase` – This argument corrupts the encryption keys that may have been present on the drive.
- `blockerase` – This argument allows the drive to clear or erase the existing data drive.
- `ause` – If, for some reason, the sanitize operation fails, the system tries to bring the drive out of the failure mode irrespective of whether you specify the Allow Unrestricted Sanitize Exit (AUSE) argument or not.
  However, if this argument is specified, and if the system succeeds in bringing the drive out of the failure mode, the drive is then returned as an Unconfigured Good drive. If you do not specify the *ause* argument, and if the sanitize operation fails, the system places the drive in an Unconfigured Bad state.

Input example:

```
storcli /c0/e0/s4 start sanitize overwrite
```

storcli /cx[/ex]/sx show sanitize

This command displays the progress of the sanitize operation in percentage.

Input example:

```
storcli /c0/e0/s4 show sanitize
```

storcli /cx[/ex]/sx start sanitize overwrite [ause] [invert] [overwritecount=<val>] [patternA=<val> patternB=<val> patternC=<val> patternD=<val>]

This command sanitizes drives with overwrite and specified patterns.

- `ause` – Allow Unrestricted Sanitize Exit.
- `overwritecount` – The number of overwrites.
- `invert` – Inverts the bits.
- `pattern` – Pattern to overwrite the data.
- `PatternA` – 8-Bit binary pattern to overwrite the data. (Example:01001101)
- `PatternB` – 8-Bit binary pattern to overwrite the data. (Example:01001101)
- `PatternC` – 8-Bit binary pattern to overwrite the data. (Example:01001101)
- `PatternD` – 8-Bit binary pattern to overwrite the data. (Example:01001101)

Drive Performance Monitoring Commands

The StorCLI utility supports the following commands for drive performance monitoring:

```
storcli /cx show dpm
storcli /cx start dpm
storcli /cx stop dpm
storcli /cx start dpm
```

The detailed description for each command follows.

storcli / cx show dpm

This command shows the drive performance monitoring status on the controller.

Input example:

```
storcli /c0 show dpm
```

storcli / cx start dpm

This command starts the performance monitoring on the controller.

Input example:

```
storcli /c0 start dpm
```

storcli / cx stop dpm

This command stops the performance monitoring on the controller.

Input example:

```
storcli /c0 stop dpm
```

Virtual Drive Commands

The StorCLI tool supports the virtual drive commands that follow. The table that follows describes frequently used virtual drive commands.

Table 15: Virtual Drives Commands Quick Reference Table

Commands	Value Range	Description
`add`	See the **Add RAID Configuration Input Options** tables.	Creates virtual drives. See Add Virtual Drives Commands.
`delete`	`cc` or `cachecade` : Deletes CacheCade virtual drives. `force` : Deletes the virtual drive where the operating system resides.	Deletes a virtual drive. See Delete Virtual Drives Commands.
`set`	See the **Add RAID Configuration Input Options** table.	Sets virtual drive properties. See Add Virtual Drives Commands, for more information.
`show`	`all` : Shows all properties of the virtual drive. `cc` : Shows properties of CacheCade virtual drives.	Shows virtual drive information. See the Virtual Drive Show Commands section.

Add Virtual Drives Commands

The StorCLI tool supports the commands that follow to add virtual drives:

```
storcli /cx add vd r[0|1|5|6|10|50|60]
    [Size=<VD1_Sz>,<VD2_Sz>,..|remaining] [name=<VDNAME1>,..]
    drives=[e:]s|[e:]s-x|[e:]s-x,y [PDperArray=x][SED]
    [pdcache=on|off|default][pi][DimmerSwitch(ds)=default|automatic(auto)|
    none|maximum(max)|MaximumWithoutCaching(maxnocache)][WT|WB|AWB][nora|ra]
    [direct|cached] [cachevd] [unmap][Strip=<8|16|32|64|128|256|512|1024>]
    [AfterVd=X] [EmulationType=0|1|2] [Spares = [e:]s|[e:]s-x|[e:]s-x,y]
```

```
[force][ExclusiveAccess] [Cbsize=0|1|2 Cbmode=0|1|2|3|4|7]
```

NOTE
The supported strip size can vary from a minimum of 64 KB to 1 MB for MegaRAID controllers and only 64 KB for Integrated MegaRAID controllers.

```
storcli /cx add vd each r0 [name=<VDNAME1>,..] [drives=[e:]s|[e:]s-x|[e:]s-x,y]|all
    [SED] [pdcache=on|off|default][pi] [DimmerSwitch(ds)=default|
    automatic(auto)|none|maximum(max)|MaximumWithoutCaching(maxnocache)]
    [WT|WB|AWB] [nora|ra] [direct|cached] [EmulationType=0|1|2]
    [Strip=<8|16|32|64|128|256|512|1024>] [ExclusiveAccess]
    [Cbsize=0|1|2 Cbmode=0|1|2|3|4|7] [unmap]
```

NOTE
The supported strip size can vary from a minimum of 64 KB to 1 MB for MegaRAID controllers and only 64 KB for Integrated MegaRAID controllers.

```
storcli /cx add VD cachecade|cc raid[0,1] drives =[e:]s|[e:]s-x|[e:]s-x,y [WT|WB|AWB] [assignvds = 0,1,2]
```

This command creates a RAID configuration. You can use the following options to create the RAID volume:

NOTE
* indicates default values.

The detailed description for each command follows.

storcli /cx add vd raid[0|1|5|6|10|50|60][Size=<VD1_Sz>,<VD2_Sz>,..|*all] [name=<VDNAME1>,..] drives=e:s|e:s-x|e:s-x,y;e:s-x,y,z [PDperArray=x][pdcache=on|off|*default]=default|automatic(auto)| *none|maximum(max)| MaximumWithoutCaching(maxnocache)][cachevd][ExclusiveAccess|SharedAccess*] [wt|*wb |awb] [nora|*ra] [*direct|cached] [EmulationType=0][Strip=<8|16|32|64|128|256|1024>] [AfterVd=x] [Spares = [e:]s[e:]s-x|[e:]s-x,y] [force]**

Table 16: Add RAID Configuration Input Options

Option	Value Range	Description
raid	[0|1|5|6|10|50|60]	Sets the RAID type of the configuration.
size	Maximum size based on the physical drives and RAID level	Sets the size of each virtual drive. The default value is for the capacity of all referenced disks.
name	15 characters of length	Specifies the drive name for each virtual drive.
drives	Valid enclosure number and valid slot numbers for the enclosure	In *e*:*s*|*e*:*s*-*x*|*e*:*s*-*x*,*y*: • *e* specifies the enclosure ID. • *s* represents the slot in the enclosure. • *e*:*s*-*x* : The range convention used to represent slots *s* to *x* in the enclosure *e* (250 characters maximum). Make sure that the same block size (in a physical drive) is used in each [*e*:*s*] pair. As an example, if you use 4096 bytes in the *e0*:*s0* pair, use 4096 bytes in the *e1*:*s1* pair too. Mixing of block sizes between the [*e*:*s*] pairs is not supported.

Option	Value Range	Description
pdperarray	1–32	Specifies the number of physical drives per span and is limited by RAID type devices per span requirements and maximum devices per controller. The default value is automatically chosen.
pdcache	on|off|default	Enables or disables PD cache.
direct|cached	cached : Cached I/O direct : Direct I/O	Sets the logical drive cache policy. Direct I/O is the default.
EmulationType	0 : Emulation 1 : Disable 2 : Force	Default setting. If any 512e drives are present in the configured ID, the physical bytes per sector value is shown as 512e (4k). If no 512e drives are present, the physical bytes per sector is shown as 512n. Even though no 512e drives are present in the configured ID, the physical bytes per sector is shown as 512n. Even though no 512e drives are present in the configured ID, the physical bytes per sector is shown as 512e (4k).
wt|wb|awb	wt : Write Through mode wb : Write Back mode awb : Always Write Back mode	Enables Write Through mode. Write Back is the default mode.
nora|ra	ra : Read Ahead mode nora : No Read Ahead	Disables read ahead mode. Enabled is the default setting.
cachevd	—	Enables SSD caching on the created virtual drive.
strip	8 , 16 , 32 , 64 , 128 , 256 , 512 , 1024 . **Note:** The supported strip size can vary from a minimum of 64 KB to 1 MB for the MegaRAID controllers and only 64 KB for Integrated MegaRAID controllers.	Sets the strip size for the RAID configuration.
aftervd	Valid virtual drive number.	Creates the VD in the adjacent free slot next to the specified VD.
spares	Number of spare physical drives present.	Specifies the physical drives that are to be assigned to a disk group for spares.
force	—	Forces a security-capable physical drive to be added to a drive group without security.
unmap	—	Enables SCSI unmap on the VD.
pi	—	Enables protection information.
sed	—	Creates security-enabled drives.

Input example:

```
storcli /c0 add vd raid10 size=2gb,3gb,4gb names=tmp1,tmp2,tmp3 drives=252:2-3,5,7 pdperarray=2
```

storcli /cx add vd cc|cachecade raid[0,1,10] drives=[e:]s|[e:]s-x|[e:]s-x,y [[wt|*wb|awb]] [assignvds=0,1,2]

This command creates CacheCade virtual drives and associates existing virtual drives to CacheCade virtual drives. You can use the options that follow to create the CacheCade virtual drive.

Table 17: Add RAID CacheCade Virtual Drive Configuration Input Options

Option	Value Range	Description
`cachecade`	—	Creates a CacheCade virtual drive.
`raid`	`0,1,10`	Sets the RAID type of the CacheCade virtual drive.
`drives`	Valid enclosure number and valid slot number	See the `drives` row in the previous table for format.
`wt|*wb`	`wt` : Enables Write Through mode `wb` : Enables Write Back mode	Enables or disables write cache.
`assignvds`	Valid virtual drive number (0 to 63)	Specifies the list of virtual drives associated with the new CacheCade virtual drives.

Input example:

```
storcli /c0 add vd raid10 size=2gb,3gb,4gb names=tmp1,tmp2,tmp3 drives=252:2-3, 7
```

Delete Virtual Drives Commands

The StorCLI tool supports the virtual drive `delete` commands that follow:

```
storcli /cx/vx|vall del
storcli /cx/vx|vall del cachecade
storcli /cx/vx|vall del force
storcli /cx/vx del [cachecade] [discardcache] [force]
```

NOTE

If the virtual drive has user data, you must use the `force` option to delete the virtual drive.

A virtual drive with a valid master boot record (MBR) and a partition table is considered to contain user data.

If you delete a virtual drive with a valid MBR without erasing the data and then create a new virtual drive using the same set of physical drives and the same RAID level as the deleted virtual drive, the old unerased MBR still exists at block0 of the new virtual drive, which makes it a virtual drive with valid user data. Therefore, you must provide the `force` option to delete this newly created virtual drive.

The detailed description for each command follows.

storcli /cx/vx|vall del

This command deletes a particular virtual drive or, when the `vall` option is used, all the virtual drives on the controller are deleted.

Input example:

```
storcli /c0/v2 del
```

ATTENTION

This command deletes virtual drives. Data located on these drives is longer accessible.

storcli /cx/vx|vall del cachecade

This command deletes a specific CacheCade virtual drive on a controller, or all the CacheCade configuration for a controller.

Input example:

```
storcli /c0/vall del cachecade
```

> **ATTENTION**
> This command deletes virtual drives. Data located on these drives will no longer be accessible.

storcli /cx/vx|vall del force

This command deletes a virtual drive only after the cache flush is completed. With the `force` option, the command deletes a virtual drive without waiting for the cache flush to complete.

Input example:

```
storcli /c0/v2 del force
```

> **ATTENTION**
> This command deletes the virtual drive where the operating system is present. Data located on these drives and the operating system of the drive will no longer be accessible.

storcli /cx/vx del [cachecade] [discardcache] [force]

This command with the `discardCache` option deletes the virtual drive without flushing the cached data.

Input example:

```
storcli /c0/v2 delete discardcache
```

Virtual Drive Show Commands

The StorCLI tool supports the following virtual drive `show` commands:

```
storcli /cx/vx show
storcli /cx/vx show all [logfile[=filename]]
```

The detailed description for each command follows.

storcli /cx/vx show

This command shows the summary of the virtual drive information.

Input example:

```
storcli /c0/v0 show
```

storcli /cx/vx show all [logfile[=filename]]

The `show all` command shows all of the virtual drive information, which includes the virtual drive information, physical drives used for the virtual drives, and virtual drive properties.

If you use the `logfile` option in the command syntax, the logs are written to the specified file. If you do not specify a file name, then the logs are written to the `storsas.log` file. If you do not use the `logfile` option in the command syntax, the entire log output is printed to the console.

Input example:

```
storcli /c0/v0 show all [logfile[=log.txt]]
```

Preserved Cache Commands

If a virtual drive becomes offline or is deleted because of missing physical disks, the controller preserves the dirty cache from the virtual disk. The StorCLI tool supports the commands that follow for preserved cache:

```
storcli /cx/vx delete preservedCache [force]
storcli /cx show preservedCache
```

The detailed description for each command follows.

storcli /cx/vx delete preservedcache

This command deletes the preserved cache for a particular virtual drive on the controller that is in a *missing* state. Use the `force` option to delete the preserved cache of a virtual drive in an offline state.

Input example:

```
storcli /c0/v1 delete preservedcache
```

storcli /cx show preservedCache

This command shows the virtual drive that has preserved cache and whether the virtual drive is offline or missing.

Input example:

```
storcli /c0 show preservedCache
```

Change Virtual Drive Properties Commands

The StorCLI tool supports the commands that follow to change virtual drive properties:

```
storcli /cx/vx set accesspolicy=<rw|ro|blocked|rmvblkd>
storcli /cx/vx set iopolicy=<cached|direct>
storcli /cx/vx set name=<namestring>
storcli /cx/vx set pdcache=<on|off|default>
storcli /cx/vx set rdcache=<ra|nora>
storcli /cx/vx|vall set ssdcaching=<on|off>
storcli /cx/vx|vall set HostAccess=ExclusiveAccess|SharedAccess
storcli /cx/vx set wrcache=<wt|wb|awb>
storcli /cx/vx set emulationType=0|1|2
storcli /cx/vx set ds=Default|Auto|None|Max|MaxNoCache
storcli /cx/vx set autobgi=On|Off
storcli /cx/vx set pi=Off
storcli /cx/vx set bootdrive=<On|Off>
storcli /cx/vx set hidden=On|Off
storcli /cx/vx set cbsize=0|1|2 cbmode=0|1|2|3|4|7
```

The detailed description for each command follows.

storcli /cx/vx set accesspolicy=<rw|ro|blocked|rmvblkd>

This command sets the access policy on a virtual drive to read write, read only, or blocked or remove blocked.

Input example:

```
storcli /c0/v0 set accesspolicy=rw
```

storcli /cx/vx set iopolicy=<cached|direct>

This command sets the I/O policy on a virtual drive to cached I/O or direct I/O.

Input example:

```
storcli /c0/v0 set iopolicy=cached
```

storcli /cx/vx set name=<namestring>

This command names a virtual drive. The name is restricted to 15 characters.

Input example:

```
storcli /c1/v0 set name=testdrive123
```

storcli /cx/vx set pdcache=<on|off|default>

This command sets the current disk cache policy on a virtual drive to on, off, or default setting.

Input example:

```
storcli /c0/v0 set pdcache=on
```

storcli /cx/vx set rdcache=<ra|nora>

This command sets the read cache policy on a virtual drive to read ahead or no read ahead.

Input example:

```
storcli /c0/v0 set rdcache=nora
```

storcli /cx/vx|vall set ssdcaching=<on|off>

This command assigns CacheCade virtual drives. If `ssdcaching=off` , the CacheCade virtual drive is removed.

Input example:

```
storcli /c0/v0 set ssdcaching=on
```

storcli /cx/vx|vall set HostAccess=ExclusiveAccess|SharedAccess

This command sets the host access policy for the virtual drive. when the host access policy is exclusive access, a server has exclusive access to the virtual drive. The virtual drive cannot be shared between servers. If the host policy is shared access, the virtual drive can be shared between servers.

Input example:

```
storcli /c0/v0 set HostAccess=ExclusiveAccess
```

storcli/cx/vx set wrcache=<wt|wb|awb>

This command sets the write cache policy on a virtual drive to write back, write through, or always write back.

Input example:

```
storcli /c0/v0 set wrcache=wt
```

storcli /cx/vx set hidden=on|off

This command hides or unhides a virtual drive. If `hidden=on` , the virtual drive is hidden.

Input example:

```
storcli /c0/v0 set hidden=on
```

storcli /cx/vx set cbsize=0|1|2 cbmode=0|1|2|3|4|7

This command sets the Cache bypass size and the Cache bypass mode on a virtual drive.

The `cbsize` options follow:

- `0` – 64k Cache bypass.
- `1` – 128k Cache bypass.
- `2` – 256k Cache bypass.

The `cbmode` options follow:

- `0` – Enable the intelligent mode Cache bypass.
- `1` – Enable the standard mode Cache bypass.
- `2` – Enable the custom mode Cache bypass 1.
- `3` – Enable the custom mode Cache bypass 2.
- `4` – Enable the custom mode Cache bypass 3.
- `7` – Disable Cache bypass.

> **NOTE**
>
> When `cbmode` is set to `7`, the user given `cbsize` value is ignored.

Input example:

```
storcli /c0/v0 set cbsize=1 cbmode=2
```

Virtual Drive Initialization Commands

The StorCLI tool supports the following commands to initialize virtual drives:

```
storcli /cx/vx show init
storcli /cx/vx start init [full][Force]
storcli /cx/vx stop init
```

> **NOTE**
>
> If the virtual drive contains user data, you must use the `force` option to initialize the virtual drive.
>
> A virtual drive with a valid MBR and partition table is considered to contain user data.

The detailed description for each command follows.

storcli /cx/vx show init

This command shows the initialization progress of a virtual drive in percentage.

The estimated time (in minutes) left to complete the operation is also shown.

Input example:

```
storcli /c0/v2 show init
```

storcli /cx/vx start init [full]

This command starts the initialization of a virtual drive. The default initialization type is fast initialization. If the `full` option is specified, full initialization of the virtual drive starts.

Input example:

```
storcli /cx/vx start init [full]
```

storcli /cx/vx stop init

This command stops the initialization of a virtual drive. A stopped initialization cannot be resumed.

Input example:

```
storcli /c0/v0 stop init
```

Virtual Drive Erase Commands

> **NOTE**
> Use disk management tools within the operating system to first unmount the volume before performing an erase.

The StorCLI tool supports the following commands to erase virtual drives:

```
storcli /cx/vx start erase [simple | normal | thorough [patternA=<val> [patternB=<val>]]
storcli /cx/vx show erase
```

The detailed description for each command follows.

storcli /cx/vx start erase [simple | normal | thorough [patternA=<val> [patternB=<val>]]

This command erases the data on the virtual drive. You can use the following options with the start erase command:

Table 18: Start Erase Command Options

Options	Value Range	Description
`erase`	`simple`: Single pass, single pattern write. `normal`: Three pass, three pattern write. `thorough`: Nine pass, repeats the normal write three times.	Erase type.
patternA	8-bit value	Erase pattern A to overwrite the data.
patternB	8-bit value	Erase pattern B to overwrite the data.

Input example:

```
storcli /c0/e25/s1 start erase thorough patternA=10010011 patternB=11110000
```

storcli /cx/vx show erase

This command shows the status of the erase operation on the virtual drive.

Input example:

```
storcli /c0/v0 show erase
```

Virtual Drive Migration Commands

NOTE
The virtual drive migration commands are not supported in Embedded MegaRAID.

The StorCLI tool supports the following commands for virtual drive migration (reconstruction):

```
storcli /cx/vx show migrate
storcli /cx/vx start migrate <type=raidx> [option=<add|remove> drives=[e:x]s|[e:x]s-x|[e:]s-x,y] [Force]
```

The detailed description for each command follows.

storcli /cx/vx show migrate

This command shows the progress of the virtual drive migrate operation in percentage.

The estimated time (in minutes) left to complete the operation is also shown.

Input example:

```
storcli /c0/v0 show migrate
```

storcli /cx/vx start migrate <type=raidlevel> [option=<add | remove> drives=<e1:s1,e2:s2 ...>]

This command starts the reconstruction on a virtual drive to the specified RAID level by adding or removing drives from the existing virtual drive. You can use the options that follow with the start migrate command.

Table 19: Virtual Drive Migration Command Options

Options	Value Range	Description
type = *RAID level*	RAID [0|1|5|6]	The RAID level to which the virtual drive must be migrated.
[option=<add | remove> drives=<e1:s1,e2:s2, … >]	add : Adds drives to the virtual drive and starts reconstruction. remove : Removes drives from the virtual drive and starts reconstruction. drives : The enclosure number and the slot number of the drives to be added to the virtual drive. Make sure that the same block size (in a physical drive) is used in each [e :s] pair. As an example, if you use 4096 bytes in the e0 :s0 pair, use 4096 bytes in the e1 :s1 pair too. Mixing of block sizes between the [e :s] pairs is not supported.	Adds or removes drives from the virtual drive.

Virtual drive migration can be done between the following RAID levels.

Table 20: Virtual Drive Migration Table

Initial RAID level	Migrated RAID level
RAID 0	RAID 1
RAID 0	RAID 5
RAID 0	RAID 6

Initial RAID level	Migrated RAID level
RAID 1	RAID 0
RAID 1	RAID 5
RAID 1	RAID 6
RAID 5	RAID 0
RAID 5	RAID 6
RAID 6	RAID 0
RAID 6	RAID 5

Input example

In the following example, `252` is the enclosure number and `0` , `1` , and `2` are the slot numbers.

```
storcli/c0/v0 start migrate type=raid0 option=add drives=252:0,252:1,252:2
```

Virtual Drive Consistency Check Commands

The StorCLI tool supports the commands that follow for virtual drive consistency checks:

```
storcli /cx/vx pause cc
storcli /cx/vx resume cc
storcli /cx/vx show cc
storcli /cx/vx start cc [force]
storcli /cx/vx stop cc
```

> **NOTE**
> If enclosures are used to connect the physical drives to the controller, specify the IDs in the command.

The detailed description for each command follows.

storcli /cx/vx pause cc

This command pauses an ongoing consistency check process. You can resume the consistency check at a later time. You can run this command only on a virtual drive that has a consistency check operation running.

Input example:

```
storcli /c0/v4 pause cc
```

storcli /cx/vx resume cc

This command resumes a suspended consistency check operation. You can run this command on a virtual drive that has a paused consistency check operation.

Input example:

```
storcli /c0/v4 resume cc
```

storcli /cx/vx show cc

This command shows the progress of the consistency check operation in percentage.

The estimated time (in minutes) left to complete the operation is also shown.

Input example:

```
storcli /c0/v5 show cc
```

storcli /cx/vx start cc force

This command starts a consistency check operation for a virtual drive. Typically, a consistency check operation is run on an initialized virtual drive. Use the `force` option to run a consistency check on an uninitialized drive.

Input example:

```
storcli /c0/v4 start cc
```

storcli /cx/vx stop cc

This command stops a consistency check operation. You can run this command only for a virtual drive that has a consistency check operation running.

Input example:

```
storcli /c0/v4 stop cc
```

> **NOTE**
> You cannot resume a stopped consistency check process.

Background Initialization Commands

The StorCLI tool supports the following commands for background initialization:

```
storcli /cx/vx resume bgi
storcli /cx/vx set autobgi=<on|off>
storcli /cx/vx show autobgi
storcli /cx/vx show bgi
storcli /cx/vx stop bgi
storcli /cx/vx suspend bgi
```

The detailed description for each command follows.

storcli /cx/vx resume bgi

This command resumes a suspended background initialization operation.

Input example:

```
storcli /c0/v0 resume bgi
```

storcli /cx/vx set autobgi=<on|off>

This command sets the auto background initialization setting for a virtual drive to on or off.

Input example:

```
storcli /c0/v0 set autobgi=on
```

storcli /cx/vx show autobgi

This command shows the background initialization setting for a virtual drive.

The estimated time (in minutes) left to complete the operation is also shown.

Input example:

```
storcli /c0/v0 show autobgi
```

storcli /cx/vx show bgi

This command shows the background initialization progress on the specified virtual drive in percentage.

The estimated time (in minutes) left to complete the operation is also shown.

Input example:

```
storcli /c0/v0 show bgi
```

storcli /cx/vx stop bgi

This command stops a background initialization operation. You can run this command only for a virtual drive that is currently initialized.

Input example:

```
storcli /c0/v4 stop bgi
```

storcli /cx/vx pause bgi

This command suspends a background initialization operation. You can run this command only for a virtual drive that is currently initialized.

Input example:

```
storcli /c0/v4 pause bgi
```

Virtual Drive Expansion Commands

The StorCLI tool supports the commands that follow for virtual drive expansion:

```
storcli /cx/vx expand size=<value> [expandarray]
storcli /cx/vx|vall show expansion
```

The detailed description for each command follows.

storcli /cx/vx expand size=<value> [expandarray]

This command expands the virtual drive within the existing array or if you replace the drives with drives larger than the size of the existing array. Even though the value you provided might be in MB, the value of the expanded size is displayed based on the nearest possible unit. Depending on the input (value) you provided, the `storcli` command recognizes the size from the input you provided and rounds up the size to the nearest percentage of free space remaining on the drive group. Because of this rounding, the actual expanded size might differ from the size you requested. If the `expandarray` option is specified, the existing array is expanded. If this option is not specified, the virtual drive is expanded.

storcli /cx/vx show expansion

This command shows the expansion information on the virtual drive with and without array expansion.

Input example:

```
storcli /c0/v0 show expansion
```

Display the Bad Block Table

The StorCLI tool supports the command that follows to check for bad block entries of virtual drives on the selected controller:

```
storcli /cx/vx show bbmt
```

The detailed description for the command follows.

storcli /cx/vx show bbmt

Input example:

```
storcli /c0/v0 show bbmt
```

Clear the LDBBM Table Entires

The StorCLI tool supports the command that follows to clear the LDBBM table entries:

```
storcli /cx/vx delete bbmt
```

The detailed description for the command follows.

storcli /cx/vx delete bbmt

Input example:

```
storcli /c0/v0 delete bbmt
```

Clear a Configuration

Use the `delete config` command to clear an existing configuration.

```
storcli /cx delete config [force]
```

The detailed description for the command follows.

storcli /cx delete config [force]

This command lets you clear an existing configuration.

Input example

```
storcli /c0 delete config[force]
```

Virtual Drive Security Command

The StorCLI utility supports the following virtual drive security commands:

```
storcli /cx/dx set securitykey=on
```

storcli /cx/dx set security=on

This command sets the security on the virtual drive or disk groups.

Input example:

```
storcli /c0/d4 set security=on
```

Foreign Configuration Commands

The StorCLI utility supports the following commands to view, import, and delete foreign configurations:

NOTE
Import from MR to iMR is based on the original configuration being within the abilities of the new controller.

```
storcli /cx/fall del|delete [securitykey=sssssssssss]
storcli /cx/fall import [preview][securitykey=sssssssssss]
storcli /cx/fall show [all] [securitykey=sssssssssss]
```

NOTE

Provide the security key when importing a locked foreign configuration created in a different machine that is encrypted with a security key.

When unlocking the JBODs with a valid security key, if foreign auto import is enabled then the JBODs will not be seen with any foreign configuration commands.

The detailed description for each command follows.

storcli /cx/fall del|delete [securitykey=sssssssssss]

This command deletes the foreign configuration of a controller. Input the security key if the controller is secured.

NOTE
If the JBOD is locked, use the reprovision command to delete the foreign configuration.

Input example:

```
storcli /c0/fall delete
```

storcli /cx/fall import [preview] [securitykey=sssssssssss]

This command imports the foreign configurations of a controller. The `preview` option shows a summary of the foreign configuration before importing it.

Input example:

```
storcli /c0/fall import
```

storcli /cx/fall show [all][securitykey=sssssssssss]

This command shows the summary of the entire foreign configuration for a particular controller. The `all` option shows all the information of the entire foreign configuration.

NOTE
The EID:Slot column is populated for the foreign PDs that are locked.

Input example:

```
storcli /c0/fall show preview
storcli /c0/fall import preview
storcli /c0/fall show all
```

BIOS-Related Commands

The Storage Command Line Interface Tool supports the following BIOS commands:

```
storcli /cx set bios [state=<on|off>] [abs=<on|off>]  [DeviceExposure=<value>]
```

The detailed description for the command follows.

storcli /cx set bios [state=<on|off>] [abs=<on|off>] [DeviceExposure=<value>]

This command enables or disables the controller's BIOS, sets the BIOS boot mode, and enables the BIOS to select the best logical drive as the boot drive.

> **NOTE**
> The legacy BIOS can load a limited number of the PCI device's BIOS. Disable the BIOS to avoid issues during POST.

Input example:

```
storcli /c0 set bios[state=on][abs=on][deviceexposure=20]
```

OPROM BIOS Commands

The StorCLI tool supports the following OPROM BIOS commands:

```
storcli /cx/ex/sx set bootdrive=on|off
storcli /cx/vx set bootdrive=on|off
storcli /cx show bootdrive
```

The detailed description for each command follows.

storcli /cx/ex/sx set bootdrive=on|off

This command sets the specified physical drive as the boot drive. During the next reboot, the BIOS looks for a boot sector in the specified physical drive.

Input example:

```
storcli /c0/e32/s4 set bootdrive=on
```

storcli /cx/vx set bootdrive=on|off

This command sets the specified virtual drive as the boot drive. During the next reboot, the BIOS looks for a boot sector in the specified virtual drive.

Input example:

```
storcli /c0/v0 set bootdrive=on
```

storcli /cx show bootdrive

This command shows the boot drive for the controller. The boot drive can be a physical drive or a virtual drive.

Input example:

```
storcli /cx show bootdrive
```

Drive Group Commands

This section describes the drive group commands.

Drive Group Show Commands

The StorCLI tool supports the drive group commands that follow:

```
storcli /cx/dall show
```

```
storcli /cx/dall show all
storcli /cx/dall show cachecade
storcli /cx/dx show
storcli /cx/dx show all
storcli /cx/dx split mirror
storcli /cx/dall show mirror
storcli /cx/dall add mirror src=<val>[force]
storcli /cx/dx set hidden=<on|off>
```

storcli /cx/dall show

This command shows the topology information of all the drive group.

Input example:

```
storcli /c0/dall show
```

storcli /cx/dall show all

This command shows all available configurations in the controller which includes topology information, virtual drive information, physical drive information, free space, and free slot information.

Input example:

```
storcli /c0/dall show all
```

storcli /cx/dall show cachecade

This command shows all CacheCade virtual drive information.

Input example:

```
storcli /c0/dall show cachecade
```

storcli /cx/dx show

This command shows the topology information of the drive group.

Input example:

```
storcli /c0/dx show
```

storcli /cx/dx show all

This command shows the physical drive and the virtual drive information for the drive group.

Input example:

```
storcli /c0/dx show all
```

storcli /cx/dx split mirror

This command enables you to perform a break mirror operation on a drive group. The break mirror operation enables a RAID 1 configured drive group to be broken into two volumes. You can use one of the volumes in another system and replicate it without making a copy of the virtual drive.

Input example:

```
storcli /c0/dx split mirror
```

storcli /cx/dall show mirror

This command shows information about the mirror associated with the drive group.

Input example:

```
storcli /c0/dall show mirror
```

storcli /cx/dall add mirror src=<val>[force]

This command joins the virtual drive with its mirror. The possible values to be used are 0, 1, or 2.

Input example:

```
storcli /c0/dall add mirror src=<1>[force]
```

storcli /cx/dx set hidden=<on|off>

This command hides or unhides a drive group.

Input example:

```
storcli /c0/d0 set hidden=on
```

Enclosure Commands

The StorCLI tool supports the enclosure commands that follow:

```
storcli /cx/ex download src=<filepath> [mode=5] [forceActivate] mode=7] [bufferid=<val>] [chunksize=<val>]
storcli /cx/ex download src=<filepath> mode=e [offline] [forceActivate [delay=<val>]] [bufferid=<val>]
 [chunksize=<val>]
storcli /cx/ex download mode=f [offline] [delay=<val>] [bufferid=<val>]
storcli /cx/ex show all
storcli /cx/ex show status
storcli /cx[/ex]/sx download src=<filepath> mode= E [offline] [activatenow [delay=<val>] ] [chunksize=<val>]
```

The detailed description for each command follows.

> **NOTE**
>
> StorCLI supports and can be used to qualify only Broadcom expanders and enclosures.

storcli /cx/ex download src=filepath [mode=5 | [forceActivate] mode=7] [bufferid=<val>] [chunksize=<val>]

This command flashes the firmware with the file that is specified at the command line. The option that follows can be used with the enclosure firmware download command.

Table 21: Enclosure Firmware Download Command Options

Option	Value Range	Description
activatenow	—	This option must be specified if activation is immediately required.
forceactivate		Issues a command descriptor block (CDB) with the write command with no data with command mode 0x0F (flash download already in progress). This option may be required to activate new enclosure firmware. Check the enclosure manual for details.

NOTE
The firmware file that is used to flash the enclosure can be of any format. The StorCLI utility assumes that you provide a valid firmware image.

Input example:

```
storcli /c0/e0 download src=c:\file2.bin mode = E
```

storcli /cx/ex download src=filepath mode=e offline [forceActivate [delay=val]] [bufferid=<val>] [chunksize=<val>]

This command supports the drive firmware using `Mode E`. `Mode E` downloads the microcode and allows you to issue this command for multiple devices.

NOTE
You can download as well as activate the drive firmware by executing the `activenow` command in the same command line. You can also specify the delay time, but the delay time that is specified by you is applicable only for activation and not for downloading the drive firmware.

Syntax:

```
storcli /cx/ex download src= mode=e offline [forceActivate]
```

Where:

- `/cx` – Specifies the controller, where *x* is the index of the controller.
- `/ex` – Specifies the enclosure ID of the controller (optional).

Input example:

```
storcli /c0/e25 download src=file.rom mode=E offline
```

storcli /cx/ex download mode=f offline [delay=val] [bufferid=<val>]

This command supports the drive firmware that uses `Mode F`. `Mode F` activates the deferred microcode and allows you to issue this command to all devices in a safe manner. You cannot issue this command before issuing the `Mode E` command. The default delay time is 15 seconds. You can specify any delay time between 1 and 300 seconds.

Syntax:

```
storcli /cx/ex download mode=f offline
```

Where:

- `/cx` – Specifies the controller, where *x* is the index of the controller.
- `/ex` – Specifies the enclosure ID of the controller (optional).

Input example:

```
storcli /c0/e25/ download mode=F offline delay=15
```

storcli /cx/ex show all

This command shows all enclosure information, which includes general enclosure information, enclosure inquiry data, a count of enclosure elements, and information about the enclosure elements.

Input example:

```
storcli /c0/e0 show all
```

storcli /cx/ex show status

This command shows the enclosure status and the status of all the enclosure elements.

Input example:

```
storcli /c0/e0 show status
```

PHY Commands

The Storage Command Line Interface Tool supports the following phy commands:

```
storcli /cx/px|pall show
storcli /cx/px|pall show all
storcli /cx/ex show phyerrorcounters
storcli /cx[/ex]/sx show phyerrorcounters
storcli /cx[/ex]/sx reset phyerrorcounters
storcli /cx/px set linkspeed=0(auto)|1.5|3|6|12|22.5
storcli /cx/px set state=on|off
```

> **NOTE**
> Changing the link speed or lane speed is not supported.

The detailed description for each command follows.

storcli /cx/px|pall show

This command shows the basic phy layer information.

Input example:

```
storcli /c1/p0 show
```

storcli /cx/px|pall show all

This command shows all the phy layer information.

Input example:

```
storcli /c1/p0 show all
```

storcli /cx/ex show phyerrorcounters

This command shows the enclosure/expander phy error counters.

Input example:

```
storcli /c1/e0 show phyerrorcounters
```

storcli /cx[/ex]/sx show phyerrorcounters

This command shows the drive phy error counters.

Input example:

```
storcli /c1/e0/s0 show phyerrorcounters
```

storcli /cx[/ex]/sx reset phyerrorcounters

This command resets the drive phy error counters.

Input example:

```
storcli /c1/e0/s0 reset phyerrorcounters
```

storcli /cx/px set linkspeed=0(auto)|1.5|3|6|12|22.5

This command sets the PHY link speed. You can set the speed to 1.5Gb/s, 3Gb/s, 6Gb/s, 12Gb/s, or 22.5 Gb/s. The link speed is set to auto when you specify `linkspeed = 0`.

Input example:

```
storcli /c1/p0 set linkspeed=1.5
```

storcli /cx/px set state=on|off

This command enables or disables Phy interfaces.

Input example:

```
storcli /cx/pall set state=on|off
```

Where:

`cx` – Specifies the controller, where x is the index

Log File Commands

The StorCLI tool supports the commands that follow to generate and maintain log files:

```
storcli /cx delete events
storcli /cx delete termlog
storcli /cx show events file=<absolute path>
storcli /cx show eventloginfo
storcli /cx show termlog type=config|contents [logfile[=filename]]
storcli /cx show dequeuelog file =<filepath>
storcli /cx show alilog [logfile[=filename]]
storcli /cx show events [ [type= <sincereboot| sinceshutdown| includedeleted|latest=x| ccincon vd=<0,1,...>]
 [filter=<[info],[warning],[critical],[fatal]>] [file=<filepath>] [logfile[=filename]] ]
```

The detailed description for each command follows.

storcli /cx delete events

This command deletes all records in the event log.

Input example:

```
storcli /c0 delete events
```

storcli /cx delete termlog

This command clears the TTY (firmware log for issue troubleshooting) logs.

Input example:

```
storcli /c0 delete termlog
```

storcli /cx show eventloginfo

This command shows the history of log files generated.

Input example:

```
storcli /c0 show eventloginfo type=config
```

storcli /cx show events [[type= sincereboot| sinceshutdown| includedeleted|latest=x| ccincon vd=<0,1,...>] [filter=info|warning| critical|fatal] [file=<filepath>] [logfile[=filename]]]

This command gets the event log entry details. The information shown consists of the total number of entries available at the firmware side since the last clear. The information includes the details of each entry of the error log.

Table 22: Logging Command Options

Option	Description
`latest=x`	Dumps the latest x number of events, if any exist. The event data will be written to the file in reverse order which includes deleted events
`ccincon`	Dumps if any CC errors logged on a VD.
`sincereboot`	Dumps all the events since last adapter reboot.
`sinceshutdown`	Dumps all the events since last controller shutdown.
`includedeleted`	Dumps all events, including deleted events. The severity levels include the following: • `info` : Informational message. No user action is necessary. • `warning` : Some component may be close to a failure point. • `critical` : A component has failed, but the system has not lost data. • `fatal` : A component has failed, and data loss has occurred or will occur.
`file`	A file that collects all the events.
`logfile`	If the file name is not specified it logs to `storsas.log` else to user given file.

Input example:

```
storcli /c0 show events file=C:\Users\brohan\test\eventreports
```

NOTE

The command output for this command cannot be JSON formatted.

storcli /cx show termlog type=config|contents [logfile[=filename]]

This command shows the firmware logs. The `config` option shows the term log configuration, the `contents` option shows the term log. The `contents` option is the default.

If you use the `logfile` option in the command syntax, the logs are written to the specified file. If you do not specify a file name, then the logs are written to the `storsas.log` file. If you do not use the `logfile` option in the command syntax, the entire log output is printed to the console.

Input example:

```
storcli /c0 show termlog=contents [logfile[=log.txt]]
```

storcli /cx show dequeuelog =<filepath>

This command shows the debug log from the firmware.

Input example:

```
storcli /c0 show dequeuelog=<c:\test\log.txt>
```

storcli /cxshow alilog [logfile[=filename]]

This command gets the controller property, TTY logs, and events to the specified file.

Input example:

```
storcli /c0 show alilog [logfile[=log.txt]]
```

Energy Pack Commands

The StorCLI tool supports the HPE Smart Storage Energy Pack command that follows:

```
storcli /cx show Energypack
```

The detailed description for this command is as follows.

storcli /cx show Energypack

This command displays the status of the HPE Smart Storage Energy Pack.

Input example:

```
storcli /c0 show Energypack
```

Message	Number	Description
MCELL_BBU_STATUS_GOOD	0x0	The energy pack is good.
MCELL_BBU_STATUS_NOT_PRESENT	0x1	The energy pack is not present.
MCELL_BBU_STATUS_CHARGING	0x8	The energy pack is charging.
MCELL_BBU_STATUS_I2CERROR	0x200	There energy pack encountered an I^2C error.
MCELL_BBU_STATUS_BAD	0x400	The energy pack is bad.
MCELL_BBU_STATUS_CABLE_FAILURE	0x80000	The energy pack cable failed.

Frequently Used Tasks

Showing the StorCLI Tool Version

The command that follows shows the version of the command line tool:

```
storcli -v
```

Showing the StorCLI Tool Help

The following command shows the StorCLI tool help:

```
storcli -h
```

Help appears for all the StorCLI tool commands.

Showing System Summary Information

The command that follows shows the summary of all the controller information:

```
storcli -show [all]
```

Showing Free Space in a Controller

The command that follows shows the free space available in the controller:

```
storcli /cx show freespace
```

Adding Virtual Drives

The command that follows creates a virtual drive:

```
storcli /cx add vd r[0|1|5|6|10|50|60]
        [Size=<VD1_Sz>,<VD2_Sz>,..|remaining] [name=<VDNAME1>,..]
        drives=[e:]s|[e:]s-x|[e:]s-x,y [PDperArray=x][SED]
        [pdcache=on|off|default][pi][WT|WB|AWB][nora|ra]
        [direct|cached] [cachevd] [unmap][Strip=<8|16|32|64|128|256|512|1024>]
        [AfterVd=X] [EmulationType=0|1|2] [Spares = [e:]s|[e:]s-x|[e:]s-x,y]
        [force][ExclusiveAccess] [Cbsize=0|1|2 Cbmode=0|1|2|3|4|7]
```

NOTE

The supported strip size can vary from a minimum of 64 KB to 1 MB for controllers and only 64 KB for Integrated controllers.

The inputs that follow can be used when adding virtual drives:

- The controller in which the virtual drives are created.
- The RAID type of the virtual drives.
  The supported RAID types are 0, 1, 5, 6, 10, 50, 60.
- The size of each virtual drive.
- The drives that are used to create the virtual drives.
  drives = *e*:*s*|*e*:*s*-*x*|*e*:*s*-*x*,*y*
  Where:

  - *e* specifies the enclosure ID.
  - *s* represents the slot in the enclosure.
  - *e*:*s*-*ex* is the range conventions used to represents slots s to x in the enclosure e.
- The physical drives per array.
  The physical drives per array can be set to a particular value.
- The PDcache option can be set to on or off .
- The pi option enables protection information.
- The Dimmer Switch is the power save policy. It can be set to default or automatic * , none , maximum(max) , or MaximumWithoutCaching(maxnocache) .
- The wt option disables write back.
- The nora option disables read ahead.
- The cached option enables the cached memory.
- The strip option sets the strip size.
  It can take the values 8 , 16 , 32 , 64 , 128 , 256 , 512 , 1024 .

  NOTE

  The supported strip size can vary from a minimum of 64 KB to 1 MB for controllers and only 64 KB for Integrated controllers.
- The AfterVdX option creates the virtual drives in the adjacent free slot next to the specified virtual drives.

  NOTE
  The * indicates default values used in the creation of the virtual drives. If values are not specified, the default values are taken.

Example: /c *x*add vd type=r1 drives=0:10-15 WB Direct strip=64

This command creates a RAID volume of RAID 1 type from drives in slots 10 to slot 15 in enclosure 0. The strip size is 64kb.

Setting the Cache Policy in a Virtual Drive

The command that follows sets the write cache policy of the virtual drive:

```
storcli /cx/v(x|all) set wrcache=wt|wb|awb
```

The command sets the write cache to write back, write through, or always write back.

Showing Virtual Drive Information

The command that follows shows the virtual drive information for all the virtual drives in the controller:

```
storcli /cx/vall show [all]
```

Deleting Virtual Drives

The following command deletes virtual drives:

```
storcli /cx/v(x|all) del [cachecade] [discardcache] [force]
```

The following inputs are required when deleting a virtual drive:

- The controller on which the virtual drive or virtual drives is present.
- The virtual drives that must be deleted; or you can delete all the virtual drives on the controller using the vall option.
- The cc or cachecade option to confirm that the deleted drive is a CacheCade drive.

Flashing Controller Firmware

The command that follows is used to flash the controller firmware.

```
storcli /cx download file=filepath [fwtype=<value>] [nosigchk] [noverchk][resetnow]
```

Generic Command Line Interface Error Messages

This chapter lists the generic software error messages for the StorCLI tool.

NOTE
Some of the error messages listed might not be applicable to your configuration, because they are generic error messages and are displayed depending on the type of controller, the features that are enabled for a particular controller, the storage environment that you are using, and so on.

Error Messages and Descriptions

Each message that appears in the event log has an error level that indicates the severity of the event, as shown in the following table.

Table 23: Error Messages and Descriptions

Decimal Number	Hex Number	Event Text
0	0x00	Command completed successfully
1	0x01	Invalid command
2	0x02	DCMD opcode is invalid
3	0x03	Input parameters are invalid
4	0x04	Invalid sequence number
5	0x05	Abort operation is not possible for the requested command
6	0x06	Application `host` code not found
7	0x07	Application already in use – try later
8	0x08	Application not initialized
9	0x09	Given array index is invalid
10	0x0A	Unable to add missing drive to array, as row has no empty slots
11	0x0B	Some of the CFG resources conflict with each other or the current configuration
12	0x0C	Invalid device ID / select-timeout
13	0x0D	Drive is too small for requested operation
14	0x0E	Flash memory allocation failed
15	0x0F	Flash download already in progress
16	0x10	Flash operation failed
17	0x11	Flash image was bad
18	0x12	Downloaded flash image is incomplete
19	0x13	Flash OPEN was not performed
20	0x14	Flash sequence is not active
21	0x15	Flush command failed
22	0x16	Specified application does not contain the host-resident code

Decimal Number	Hex Number	Event Text
23	0x17	LD operation not possible – CC is in progress
24	0x18	LD initialization in progress
25	0x19	LBA is out of range
26	0x1A	Maximum LDs are already configured
27	0x1B	LD is not OPTIMAL
28	0x1C	LD Rebuild is in progress
29	0x1D	LD is undergoing reconstruction
30	0x1E	LD RAID level is wrong for requested operation
31	0x1F	Too many spares assigned
32	0x20	Scratch memory not available – try command again later
33	0x21	Error writing MFC data to SEEPROM
34	0x22	Required hardware is missing
35	0x23	Item not found
36	0x24	LD drives are not within an enclosure
37	0x25	PD CLEAR operation is in progress
38	0x26	Unable to use SATA(SAS) drive to replace SAS(SATA)
39	0x27	Patrol Read is disabled
40	0x28	Given row index is invalid
45	0x2D	SCSI command performed, but non-GOOD status was received – see mf.hdr.extStatus for SCSI_STATUS
46	0x2E	I/O request for MFI_CMD_OP_PD_SCSI failed – see extStatus for DM error
47	0x2F	Matches SCSI RESERVATION_CONFLICT
48	0x30	One or more of the flush operations failed
49	0x31	Firmware real-time currently not set
50	0x32	Command issues while firmware in wrong state (i.e., GET RECON when op not active)
51	0x33	LD is not OFFLINE – I/O not possible
52	0x34	Peer controller rejected request (possibly due to resource conflict)
53	0x35	Unable to inform peer of communication changes (retry might be appropriate)
54	0x36	LD reservation already in progress
55	0x37	I^2C errors were detected
56	0x38	PCI errors occurred during XOR/DMA operation
57	0x39	Diagnostics failed – see event log for details
58	0x3A	Unable to process command as boot messages are pending
59	0x3B	Returned if foreign configurations are incomplete
61	0x3D	Returned if a command is tried on unsupported hardware
62	0x3E	CC scheduling is disabled
63	0x3F	PD CopyBack operation is in progress
64	0x40	Selected more than one PD per array

Decimal Number	Hex Number	Event Text
65	0x41	Microcode update operation failed
66	0x42	Unable to process command as drive security feature is not enabled
67	0x43	Controller already has a lock key
68	0x44	Lock key cannot be backed-up
69	0x45	Lock key backup cannot be verified
70	0x46	Lock key from backup failed verification
71	0x47	Re-key operation not allowed, unless controller already has a lock key
72	0x48	Lock key is not valid, cannot authenticate
73	0x49	Lock key from escrow cannot be used
74	0x4A	Lock key backup (pass-phrase) is required
75	0x4B	Secure LD exist
76	0x4C	LD secure operation is not allowed
77	0x4D	Re-provisioning is not allowed
78	0x4E	Drive security type (FDE or non-FDE) is not appropriate for requested operation
79	0x4F	LD encryption type is not supported
80	0x50	Cannot mix FDE and non-FDE drives in same array
81	0x51	Cannot mix secure and unsecured LD in same array
82	0x52	Secret key not allowed
83	0x53	Physical device errors were detected
84	0x54	Controller has LD cache pinned
85	0x55	Requested operation is already in progress
86	0x56	Another power state set operation is in progress
87	0x57	Power state of device is not correct
88	0x58	No PD is available for patrol read
89	0x59	Controller reset is required
90	0x5A	No EKM boot agent detected
91	0x5B	No space on the snapshot repository VD
92	0x5C	For consistency SET PiTs, some PiT creations might fail and some succeed
255	0xFF	Invalid status – used for polling command completion
93	0x5D	Secondary iButton cannot be used and is incompatible with controller
94	0x5E	PFK does not match or cannot be applied to the controller
95	0x5F	Maximum allowed unconfigured (configurable) PDs exist
96	0x60	I/O metrics are not being collected
97	0x61	AEC capture must be stopped before proceeding
98	0x62	Unsupported level of protection information
99	0x63	PDs in LD have incompatible EEDP types
100	0x64	Request cannot be completed because protection information is not enabled

Decimal Number	Hex Number	Event Text
101	0x65	PDs in LD have different block sizes
102	0x66	LD Cached data is present on a (this) SSCD
103	0x67	Config sequence number mismatch
104	0x68	Flash image is not supported
105	0x69	Controller cannot be online-reset
106	0x6A	Controller booted to safe mode, command is not supported in this mode
107	0x6B	SSC memory is unavailable to complete the operation
108	0x6C	Peer node is incompatible
109	0x6D	Dedicated hot spare assignment is limited to array(s) with same LDs.
110	0x6E	Signed component is not part of the image
111	0x6F	Authentication failure of the signed firmware image
112	0x70	Flashing was OK but firmware restart is not required; for example, no change in firmware from current
113	0x71	Firmware is in some form of restricted mode, example: passive in A/P HA mode
114	0x72	The maximum number of entries are exceed
115	0x73	Cannot start the subsequent flush because the previous flush is still active
116	0x74	Status is OK but a reboot is need for the change to take effect
117	0x75	Cannot perform the operation because the background operation is still in progress
118	0x76	Operation is not possible
119	0x77	Firmware update on the peer node is in progress
120	0x78	Hidden policy is not set for all of the virtual drives in the drive group that contains this virtual drive
121	0x79	Indicates that there are one or more secure system drives in the system
122	0x7A	Boot LD cannot be hidden
123	0x7B	LD count is greater than the maximum transportable LD count
124	0x7C	DHSP is associated with more than one disk group – force is needed if dcmd.mbox.b[5] is 0
125	0x7D	Operation not possible because the configuration has some LD in transport ready state
126	0x7E	I/O request encountered a SCSI DATA UNDERRUN, MFI_HDR; the length is set to bytes transferred
127	0x7F	Firmware flash operation not allowed in the current mode
128	0x80	Operation not possible because the device is in transport ready state
129	0x81	Operation not possible because the LD is in transport ready state
130	0x82	Operation not possible because the LD is not in transport ready state
131	0x83	Operation not possible because the PD is in removal ready state
132	0x84	Status OK but host reboot is required for changes to take effect
133	0x85	Microcode update is pending on the device
134	0x86	Microcode update is in progress on the device
135	0x87	Mismatch between the drive type and the erase option
136	0x88	Operation not possible because the automatic created configuration exists
137	0x89	Secure device exists – EPD or EPD-PASSTHRU

Decimal Number	Hex Number	Event Text
138	0x8A	Operation not possible because host FRU data is invalid
139	0x8B	Operation not possible because controller FRU data is invalid
140	0x8C	Requested image not found
141	0x8D	NVCache related error
142	0x8E	Requested LD size is less than the MINIMUM SIZE LIMIT
143	0x8F	Requested drive count is invalid for this RAID level
144	0x90	OEM specific backplane authentication failure
145	0x91	OEM specific backplane not found
146	0x92	Flashing an image is not possible because downloaded and running firmware on the controller are same
147	0x93	Unmap is not supported on the device
148	0xFF	Invalid status – used for polling command completion

Support and Other Resources

Accessing Hewlett Packard Enterprise Support

For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

http://www.hpe.com/assistance

To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:

http://www.hpe.com/support/hpesc

Information to collect:

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing Updates

Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

To download product updates:

Hewlett Packard Enterprise Support Center

www.hpe.com/support/hpesc

Hewlett Packard Enterprise Support Center: Software downloads

www.hpe.com/support/downloads

My HPE Software Center

www.hpe.com/support/softwaredepot

To subscribe to eNewsletters and alerts:

www.hpe.com/support/e-updates

To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center More Information on Access to Support Materials page:

www.hpe.com/support/AccessToSupportMaterials

> **NOTE**
>
> Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HPE Passport set up with relevant entitlements.

Customer Self Repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website: www.hpe.com/support/selfrepair

Remote Support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

If your product includes additional remote support details, use search to locate that information.

Remote support and Proactive Care information

- **HPE Get Connected**
  www.hpe.com/services/getconnected
- **HPE Proactive Care Services**
  www.hpe.com/services/proactivecare
- **HPE Proactive Care Service: Supported Products List**
  www.hpe.com/services/proactivecaresupportedproducts
  HPE Proactive Care Advanced Service: Supported Products List
  www.hpe.com/services/proactivecareadvancedsupportedproducts

Proactive Care Customer Information

- **Proactive Care Central**
  www.hpe.com/services/proactivecarecentral
- **Proactive Care Service Activation**
  www.hpe.com/services/proactivecarecentralgetstarted

Warranty Information

To view the warranty for your product or to view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products* reference document, go to the Enterprise Safety and Compliance website:

www.hpe.com/support/Safety-Compliance-EnterpriseProducts

Additional warranty information

- **HPE ProLiant and x86 Servers and Options**
  www.hpe.com/support/ProLiantServers-Warranties
- **HPE Enterprise Servers**
  www.hpe.com/support/EnterpriseServers-Warranties
- **HPE Storage Products**
  www.hpe.com/support/Storage-Warranties
  HPE Networking Products
  www.hpe.com/support/Networking-Warranties

Regulatory Information

To view the regulatory information for your product, view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the Hewlett Packard Enterprise Support Center:

www.hpe.com/support/Safety-Compliance-EnterpriseProducts

Additional regulatory information

Hewlett Packard Enterprise is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and the Council). A chemical information report for this product can be found at:

www.hpe.com/info/reach

For Hewlett Packard Enterprise product environmental and safety information and compliance data, includingRoHS and REACH, see:

www.hpe.com/info/ecodata

For Hewlett Packard Enterprise environmental information, including company programs, product recycling, and energy efficiency, see:

www.hpe.com/info/environment

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Revision History

Version 1.12, October 2024

- Updated the Show and Set Controller Properties Commands, Controller Show Commands, Enclosure Commands, Phy Commands, Log File Commands, Adding Virtual Drives, and Deleting Virtual Drives sections.

Version 1.11, January 2024

- Updated the Abstract and Controller Security Command section.

Version 1.10, September 2023

- Updated the Log File Commands and Show and Set Controller Properties Commands sections.

Version 1.9, May 2023

- Updated the Installing the StorCLI Tool on Linux Operating Systems, StorCLI Tool Command, Syntax, Show and Set Controller Properties Commands, Patrol Read, Premium Feature Key Commands, Flashing Controller Firmware Command, Hot Spare Drive Commands, and Foreign Configuration Commands sections.
- Added the Premium Feature Key Commands section.

Version 1.8, March 2023

- Update the Show and Set Controller Properties Commands and Controller Security Commands sections.

Version 1.7, October 2022

- Update the Installation, Installing the StorCLI Tool on Linux Operating Systems, Controller Security Commands, Drive Security Commands, and Virtual Drive Security Command sections.

Version 1.6, April 2022

- Added the Controller Security Commands, Drive Security Commands, and Virtual Drive Security Command section.
- Updated the StorCLI Tool Command Synatx, Phy Commands, and Add Virtual Drives Commands sections.
- Removed the Controllers Supported by the StorCLI Tool section.

Version 1.5, January 2021

- Added the SPDM Commands, Drive Sanitize Command, StorCLI Default Logging, and, Ubuntu support sections.
- Updated the Battery Commands and Installing the StorCLI Tool on Linux Operating Systems sections.

Version 1.0, December 2017

Initial document release.