Dell PowerEdge RAID Controller 9, 10, and 11

Command Line Interface Reference Guide

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Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

1

Overview

You can set up, configure, and manage your Dell PowerEdge RAID Controller (PERC) by using the Command Line Interface (CLI).

NOTE: Some features may not be supported on every generation of PERC, or may require a firmware update to enable a feature. See your PERC's User's Guide for information on the specific features supported by that controller. See, Documentation resources to set up and manage your system.

2

Accessing the command prompt

Topics:

Using CLI commands from Windows command prompts

Ensure that you copy the `perccli.exe` and `perccli64.exe` files to `C:\Windows\System32`.

To access the command prompt in systems using the Microsoft Windows operating system, perform the following procedure:

1. Click **Start** > **Run**.
   The **Run** window is displayed.
2. In the **Open** field, type `cmd`, and then click **OK**.
   The **Administrator: Command Prompt** window is displayed, where you can execute the PERC CLI commands.

Using CLI commands in Linux

Perform the following procedures to access the command prompt in systems using the Linux operating system:

1. To install the **percli RPM**, run **rpm -ivh <percli-x.xx-x.noarch.rpm>**, or to upgrade the **percli RPM**, run **rpm -Uvh <percli-x.xx-x.noarch.rpm>**.
2. Change the directory to **/opt/MegaRAID/perccli**.
3. As a root user, run **./perccli**.

Using CLI commands in VMware

Perform the following procedures to access the command prompt in systems using the VMware system:

1. View the list of installed VIB package using the following command: **esxcli software vib list**.
2. Install the VIB package using the command: **esxcli software vib install -v /vmfs/volume/datastore1/vmware-esx-perccli.vib** where **/vmfs/volume/datastore1** is the path detail of the VIB.
3. You can remove the installed VIB by using the command: **esxcli software vib remove -n=vmware-esx-perccli.vib --force**.
4. Run **perccli** by browsing the location: **cd /opt/lsi/perccli**.

3

Working with the PERC Command Line Interface Tool

This chapter describes the commands supported by the PERC command line tool (CLI) and their syntax.

CAUTION: The order in which you specify the command options should be the same as that given in the User Guide examples; otherwise, the command will fail.

CAUTION: Avoid using the PERC CLI in scripts that are frequently polled. Due to the overhead of PERC CLI basic commands negatively impact performance.

NOTE: The PERC Command Line Interface (CLI) Tool is not case sensitive.

NOTE: The PERC CLI Tool does not support the Snapshot feature.

Topics:

System commands

In the following sections, syntax is read as follows:

Table 1. System commands reference table

Variable	Description
all	Displays information on all controllers present on the host.
cx	Specifies the controller where *x* is the controller index.
ex	The enclosure ID.
.<file extension>	Specifies the file required for a particular command.
sx	The drive slot ID of the controller.

System show commands

The PERC Command Line Tool supports the following system show commands:

```
perccli show
perccli show all
perccli show ctrlcount
perccli show help
perccli -v
```

The detailed description for each command follows.

perccli 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 the overview of existing configuration.

perccli show all

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

perccli show ctrlcount

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

perccli show help

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

perccli -v

This command shows the version of the PERC Command Line Tool.

Controller commands

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

Show and set controller properties commands

Table 2. Controller commands quick reference table

Commands	Value range	Description
`show <properties>`	See Properties for show and set commands.	Shows specific controller properties.
`set <properties>`	See Properties for show and set commands.	Sets controller properties.
`show`	`all`: Shows all properties of the virtual drive. `freespace`: Shows the freespace in the controller. See Controller show commands.	Shows physical drive information.

This section provides command information to show and set controller properties.

NOTE: You cannot set multiple properties with a single command.

The generalized syntax for show controller properties command is as follows:

perccli /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 `perccli /cx show <property1>|<property2>` command.

NOTE: `/cx` specifies the controller where `x` is the controller index.

```
perccli /cx show abortcconerror
perccli /cx show activityforlocate
perccli /cx show backplane
perccli /cx show badblocks
perccli /cx show batterywarning
perccli /cx show bgirate
perccli /cx show bootwithpinnedcache
perccli /cx show cachebypass
perccli /cx show cacheflushint
perccli /cx show ccrate
perccli /cx show coercion
perccli /cx show cc|consistencycheck
perccli /cx show copyback
perccli /cx show ds(dimmerswitch)
perccli /cx show jbod
perccli /cx show loadbalancemode
perccli /cx show maintainpdfailhistory
perccli /cx show ncq
perccli /cx show patrolread
perccli /cx show perfmode
perccli /cx show personality
perccli /cx show pi
perccli /cx show prcorrectunconfiguredareas
perccli /cx show prrate
perccli /cx show rebuildrate
perccli /cx show reconrate
perccli /cx show restorehotspare
perccli /cx show smartpollinterval
perccli /cx show time
perccli /cx show usefdeonlyencrypt
perccli /cx(x|all) show pi
```

perccli /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 `perccli /cx set<property>=<value>` command:

```
perccli /cx set abortcconerror=<on|off>
perccli /cx set activityforlocate=<on|off>
perccli /cx set backplane mode=<value> expose=<on/off>
```

```
perccli /cx set batterywarning=<on|off>
perccli /cx set bgirate=<value>
perccli /cx set bootwithpinnedcache=<on|off>
perccli /cx set cachebypass=<on|off>
perccli /cx set cacheflushint=<value>
perccli /cx set ccrate=<value>
perccli /cx set coercion=<value>
perccli /cx show cc|consistencycheck=[off|seq|conc][delay=value] [starttime=yyyy/mm/dd
hh] [excludevd=x-y,z]
perccli /cx set copyback=<on|off> type=ctrl|smartssd|smarthdd|all
perccli /cx set eghs [state=<on|off>] [eug=on|off>] [smarter=<on|off>]
perccli /cx show ds(dimmerswitch)=<on|off type=1|2|3|4>
perccli /cx set foreignautoimport=<on|off>
perccli /cx set jbod=<on|off>
perccli /cx set loadbalancemode=<on|off>
perccli /cx set maintainpdfailhistory=<on|off>
perccli /cx set reconrate=<value>
perccli /cx set ncq=<on|off>
perccli /cx set patrolread|pr {=on mode=<auto|manual>}|{off}
perccli /cx set perfmode=<value>
perccli /cx set personality=RAID|HBA|eHBA
perccli /cx set pi[state=<on|off>] [import=<on|off>]
perccli /cx set prcorrectunconfiguredareas=<on|off>
perccli /cx set prrate=<value>
perccli /cx set rebuildrate=<value>
perccli /cx set restorehotspare=<on|off>
perccli /cx set smartpollinterval=<value>
perccli /cx set stoponerror=<on|off>
perccli /cx set usefdeonlyencrypt=<on|off>
perccli /cx set time=<yyyymmdd hh:mm:ss|systemtime>
```

The following table lists and describes the properties for the show and set commands.

Table 3. Properties for show and set commands

Property name	Set command range	Description
abortcconerror	on|off	Aborts consistency check when it detects an inconsistency.
activityforlocate	on|off	Enables/disables drive activity, drive activity locates function for systems without SGPIO/SES capabilities.
backplane	• 0: Use autodetect logic of backplanes, such as SGPIO and I2C SEP using GPIO pins. • 1: Disable autodetect SGPIO. • 2: Disable I2C SEP autodetect. • 3: Disable both the autodetects.	Configures enclosure detection on a non-SES/expander backplane.
expose	on|off	Enables device drivers to expose enclosure devices.
batterywarning	on|off	Enables/disables battery warnings.
bgirate	0 to 100	Sets background initialization rate in percentage.
cacheflushint	0 to 255, default value 4	Sets cache flush interval in seconds.
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.	See Consistency check.

Table 3. Properties for show and set commands (continued)

Property name	Set command range	Description
`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:`perccli /cx set copyback=on type=all`	Enables/disables copy back for drive types.
`eghs`	• `state=on|off`: Enables use of hotspare drives for emergency feature. • `eug=on|off`: Enables use of unconfigured good drives for emergency feature. • `smarter=on|off`: Enables use of emergency spares for copy back during SMART errors.	Enables/disables the commissioning of otherwise incompatible global hot spare drives as Emergency Hot Spare (EHSP) drives.
`exposeencldevice`	`on|off`	Enables/disables device drivers to expose enclosure devices; for example, expanders, SEPs.
`ds(dimmerswitch)`	See Dimmer switch commands.	See Dimmer switch commands.
`foreignautoimport`	`on|off`	Imports foreign configuration automatically, at boot.
`jbod`	`on|off`	Enables/disables JBOD mode; by default, drives become system drives. **NOTE:** Not supported by all controllers.
`loadbalancemode`	`on|off`	-
`maintainpdfailhistory`	`on|off`	Maintains the physical drive fail history.
`patrolread|pr`	See Patrol Read.	See Patrol Read.
`perfmode`	• `0`: Tuned to provide best IOPS, currently applicable to non-FastPath. • `1`: Tuned to provide least latency, currently applicable to non-FastPath.	Performance tuning setting for the controller.
`personality`	RAID | HBA | eHBA	Sets the personality of the controller to either RAID, HBA, or eHBA mode if it is supported by the controller.
`pi`	• `[state=<on|off>]` • `[import=<on|off>]`	• Enables/disables data protection on the controller. • Enables or disables import data protection drives on the controller.
`prcorrectunconfiguredareas`	`on|off`	Correct media errors during PR by writing 0s to unconfigured areas of the disk.
`prrate`	0 to 100	Sets patrol read rate of the virtual drives in percentage.
`rebuildrate`	0 to 100	Sets rebuild rate of the drive in percentage.

Table 3. Properties for show and set commands (continued)

Property name	Set command range	Description
`reconrate`	0 to 100	Sets reconstruction/migration rate for a drive in percentage.
`restorehotspare`	`on|off`	Becomes a hot spare on insertion of a failed drive.
`smartpollinterval`	0 to 65535	Set time for polling of SMART errors in seconds.
`spinupdrivecount`	0 to 255	Sets number of drives that are spun up at a time.
`spinupdelay`	0 to 255	Sets spin-up delay between a group of drives or a set of drives, in seconds.
`stoponerror`	`on|off`	Stops the MegaRAID BIOS during POST, if any errors are encountered.
`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).
`usefdeonlyencrypt`	`on|off`	Enables/disables FDE drive-based encryption.

Controller show commands

The PERC Command Line Tool supports the following show commands:

```
perccli /cx show
perccli /cx show all
perccli /cx show freespace
perccli /cx show personality
```

The detailed description for each command follows.

perccli /cx show personality

This command shows the personality set on the controller. eHBA mode lists the personality as `eHBA`.

Input example:

```
perccli /c1 show personality
```

perccli /cx show [jbod]

This command shows the summary of the controller information. The summary includes basic controller information, foreign configurations, drive groups, virtual drives, physical drives, enclosures, and BBU information. If you use the JBOD option, the command shows all Non-RAID disk(s) displayed in JBOD list. If the physical disk is Non-RAID, its type is set as `JBOD` and its state as `Online`.

Input example:

```
perccli /c1 show
```

perccli /cx show all

This command shows all 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, enclosures, and BBU information.

Input example:

```
perccli /c0 show all
```

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

perccli /cx show freespace

This command shows the usable free space on all disk groups in the controller.

Input example:

```
perccli /c0 show freespace
```

Controller background tasks operation commands

Rebuild Rate

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

The detailed description for each command follows.

perccli /cx set rebuildrate=<value>

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

Input example:

```
perccli /c0 set rebuildrate=30
```

NOTE: A high rebuild rate slows down I/O processing.

perccli /cx show rebuildrate

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

Input example:

```
perccli /c0 show rebuildrate
```

Patrol Read

The PERC Command Line Tool supports the following patrol read commands:

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

```
perccli /cx stop patrolread
perccli /cx suspend patrolread
```

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

The detailed description for each command follows.

perccli /cx resume patrolread

This command resumes a suspended patrol read operation.

Input example:

```
perccli /c0 resume patrolread
```

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

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

Input example:

```
perccli /co set patrolread=on mode=manual
```

perccli /cx set patrolread [starttime=< yyyy/mm/dd hh>] | [maxconcurrentpd =<value>] | [includessds=<on|onlymixed|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:

Table 4. Set Patrolread input options

Option	Value range	Description
`starttime`	Valid date and hour in the format of 24 hours.	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.
`uncfgareas`	—	Include the areas that are not configured in the patrol read.
`excludevd`	—	Excludes virtual drives from the patrol read. To exclude particular virtual drives, you can provide list of virtual drive IDs (x,y, z format) or the range of virtual drives that must be excluded from a patrolread (x-y format). If this option is not specified in the command, no virtual drives are excluded.
`none`	—	Virtual drives if any were excluded earlier is removed.

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

Input example:

```
perccli /c0 set patrolread=on starttime=2012/02/21 00
```

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

This command delays the scheduled patrol read in hours.

Input example:

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

perccli /cx show patrolread

This command shows the patrol read properties that are set on the controller, such as the current state and the start time.

Input example:

```
perccli /c0 show patrolread
```

perccli /cx start patrolread

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

Input example:

```
perccli /c0 start patrolread
```

perccli /cx stop patrolread

This command stops a running patrol read operation.

Input example:

```
perccli /c0 stop patrolread
```

NOTE: You cannot resume a stopped patrol read.

perccli /cx suspend patrolread

This command pauses a running patrol read operation.

Input example:

```
perccli /c0 suspend patrolread
```

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

Consistency check

The PERC Command Line Tool supports the following commands to schedule, perform, and view the status of a consistency check (CC) operation:

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

The detailed description for each command follows.

perccli /cx set consistencycheck |cc=[off|seq|conc] [delay=value] starttime=yyyy/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 5. Set CC 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. **NOTE:** 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 runs continuously with no delay (in a loop). **NOTE:** Only scheduled consistency checks can be delayed.
`starttime`	A valid date and hour in 24-hours format.	Start time of a consistency check is *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,Vy … format) or the range of virtual drives that you want to exclude from a consistency check (Vx-Vy format). If this option is not specified in the command, no virtual drives are excluded.
`none`	-	Virtual drives if any were excluded before, will be removed.

Input example:

```
perccli /c0 set CC=on starttime=2012/02/21 00 excludevd v0-v3
```

perccli /cx show cc

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

Input example:

```
perccli /c0 show cc
```

perccli /cx show ccrate

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

Input example:

```
perccli /c0 show ccrate
```

NOTE: A high CC rate slows I/O processing.

Controller security commands

The PERC Command Line Tool supports the following controller security commands:

```
perccli /cx compare securitykey=xxxxxxxxxx
perccli /cx delete securitykey
perccli /cx show securitykey keyid
perccli /cx set securitykey keyid=xxx
perccli /cx set perccli/cx securitykey=xxxxxxxx keyid=xxx
perccli /cx set securitykey=xxxxxxxx oldsecuritykey=xxxxxxxx [keyid=xxx]
```

The detailed description for each command follows.

perccli /cx compare securitykey=xxxxxxxxxx

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

perccli /cx delete securitykey

This command deletes the security key of the controller.

Input example:

```
perccli /c0 delete securitykey
```

perccli /cx show securitykey keyid

This command shows the key ID of the controller.

Input example:

```
perccli /c0 show securitykey keyid
```

perccli /cx set securitykey keyid=xxx

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

perccli/cx set securitykey=xxxxxxxx keyid=xxx

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

Input example:

```
perccli /c0 set securitykey=Lsi@12345 keyid=1
```

Table 6. Set security key input options

Option	Value range	Description
`Securitykey`	Should have a combination of numbers, upper case letters, lower case letters, and special characters. Minimum of 8 characters and maximum of 32 characters.	Security key is used to lock the drive.
`keyid`	—	Unique ID set for different controllers to help you map a passphrase to a specific controller.

perccli /cx set securitykey=xxxxxxxx oldsecuritykey=xxxxxxxx [keyid=xxx]

This command changes the security key for the controller.

Input example:

```
perccli /c0 set securitykey=Lsi@12345 oldsecuritykey=pass123 keyid=1
```

Flashing controller firmware command

The following command flashes the controller firmware:

perccli /cx download file=filepath [noverchk]

This command flashes the firmware to the specified adapter from the given file location (filepath is the absolute file path). You can use the following options when you flash the firmware:

Table 7. Flashing controller firmware input options

Option	Value range	Description
`noverchk`	—	The application flashes the controller firmware without checking the version of the firmware image.

Controller cache command

The following command flushes the controller cache:

perccli /cx flush|flushcache

This command flushes the controller cache.

Input example:

```
perccli /c0 flushcache
```

Controller profile commands

The PERC command line tool supports the following profile-related commands:

```
perccli /cx show profile
perccli /cx set profile profileid=<id>
```

The detailed description for each command follows.

perccli /cx show profile

This command shows current profile and profile properties.

Input example:

```
perccli /c1 show profile
```

perccli /cx set profile profileid=<id>

This command sets profile ID. The output contains control ID, status, and description attributes.

Input example:

```
perccli /c1 set profile profileid=<id>
```

NOTE: You must reboot the system for profile changes to take effect.

NOTE: Profile changes fail if:

- The new profile supports fewer drives than the number of drives supported in the current topology.
- Background operations (rebuild, copy back, full initialization, background initialization, patrol read, consistency check) are active.
- Background operations start after profile change but before you reboot the system.

HBA controller commands

NOTE: The UEFI version of PERCCLi is not supported on Dell HBA330 or 12Gbps HBA controllers. Support will be added in a future PERCCli release.

The PERC Command Line Tool supports the following HBA-related commands:

```
perccli /call show
perccli /cx download bios file=<filepath>
perccli /cx download file=<filepath>
perccli /cx/ex/sx start locate
perccli /cx/ex/sx stop locate
perccli /cx/pall show
perccli /cx show
perccli /cx show all
perccli /cx show freespace
perccli /cx show sasadd
perccli [verbose] -h| -help| ?
perccli /cx restart
perccli v
```

perccli /call show

This command shows information on all the controllers present on the host.

Input example:

```
perccli /call show
```

perccli /cx download bios file=<filepath>

Use this command to update the BIOS component on all supported controllers.

Input example:

```
perccli /c1 download bios file=<filepath>
```

perccli /cx download file=<filepath>

Use this command to flash the firmware with the .rom file to a specified adapter from the provided file location (file path is the absolute file path).

Input example:

```
perccli /cx download file=<filepath>
```

perccli /cx/ex/sx start locate

Use this command to turn on the drive LED flash to locate physical drives.

Input example:

```
perccli /c1/e10/s12 start locate
```

perccli /cx/ex/sx stop locate

Use this command to turn off the drive LED flash to locate physical drives.

Input example:

```
perccli /c1/e10/s12 stop locate
```

perccli /cx/pall show

This command shows the basic PHY layer information on a specified adapter.

Input example:

```
perccli /c1/pall show
```

perccli /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, enclosures, and BBU information.

Input example:

```
perccli /c1 show
```

perccli /cx show all <logfile>

This command shows all of the controller information, including 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, enclosures, and BBU information.

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

Ensure that the filename does not contain a blank space.

Input example:

```
perccli /c0 show all logfile=log.txt
```

perccli /cx show freespace

This command shows the usable free space in the controller.

Input example:

```
perccli /c0 show freespace
```

perccli /cx show sasadd

This command displays the SAS address of the specified controller.

Input example:

```
perccli /c1 show sasadd
```

perccli [verbose] -h| -help| ?

This command displays the perccli help.

Input example:

```
perccli –h
```

perccli /cx restart

Using this command, you can reset a specific controller or reset all controllers connected to the host. This command resets the chip hardware and reinitializes all the chip information.

Input example:

```
perccli /c1 restart
```

perccli —v

This command displays the version of the command line tool.

Input example:

```
perccli –v
```

Drive commands

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

Table 8. 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 PERC Command Line Tool supports the following drive show commands:

```
perccli /cx[/ex]/sx show
perccli /cx[/eall]/sall show
perccli /cx[/ex]/sx|sall show all
perccli /cx[/ex]/sall show jbod
perccli /cx[/ex]/sx show jbod
```

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.

perccli /cx[/ex]/sx show

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

Input example:

```
perccli /c0/e0/s4,5 show
```

perccli /cx[/eall]/sall show

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

Input example:

```
perccli /c0/eall/sall show
```

perccli /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. `x` stands for a number, a list of numbers, a range of numbers, or all numbers.

Input examples:

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

NOTE: The `perccli /cx/sx show all` command shows tape drives information.

perccli /cx[/eall]/sall show jbod

This command shows the summary information for all the enclosures and physical drives connected to the controller. If you use the `JBOD` option, the command shows all Non-RAID disk(s) displayed in JBOD list. If physical disk is Non-RAID, type is set as `JBOD` and state as `Online`. ID displays the target ID Non-RAID disks.

Input example:

```
perccli /c0/eall/sall show jbod
```

perccli /cx[/ex]/sx show jbod

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

Input example:

```
perccli /c0/e0/s4,5 show jbod
```

Missing drives commands

The PERC Command Line Tool supports the following commands to mark and replace missing physical drives:

```
perccli /cx[/ex]/sx set offline
perccli /cx[/ex]/sx set missing
perccli /cx /dall show
perccli /cx[/ex]/sx insert dg=a array=b row=c
perccli /cx[/ex]/sx start rebuild
```

The detailed description for each command follows.

perccli /cx[/ex]/sx set offline

This command marks the 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 set the drive to missing.

Input example:

```
perccli /c1/e56/s3 set offline
```

perccli /cx[/ex]/sx set missing

This command marks a drive as missing.

Input example:

```
perccli /c0/s4 set missing
```

perccli /cx /dall show

This command shows the topology information of the drive group.

Input example:

```
perccli /c0/dall show
```

perccli /cx[/ex]/sx insert dg=a array=b row=c

This command replaces the configured drive that is identified as missing. User must manually start the rebuild.

Input example:

```
perccli /c0/e32/s4 insert dg=2 array=2 row=1
```

perccli /cx[/ex]/sx start rebuild

This command starts a rebuild operation for a drive.

Input example:

```
perccli /c0/e32/s4 start rebuild
```

Drive initialization commands

When you initialize drives, all the data from the drives is cleared. The PERC Command Line Tool supports the following commands to initialize drives:

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

The detailed description for each command follows.

perccli /cx[/ex]/sx show initialization

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

Input example:

```
perccli /c0/e31/s4 show initialization
```

perccli /cx[/ex]/sx start initialization

This command starts the initialization process on a drive.

Input example:

```
perccli /c0/e31/s4 start initialization
```

perccli /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:

```
perccli /c0/e56/s1 stop initialization
```

Set drive state commands

The PERC Command Line Tool supports the following commands to set the status of physical drives:

```
perccli /cx[/ex]/sx set jbod
perccli /cx[/ex]/sx set good [force]
perccli /cx[/ex]/sx set offline
perccli /cx[/ex]/sx set online
perccli /cx[/ex]/sall set jbod
perccli /cx[/ex]/sx-y set jbod
```

The detailed description for each command follows.

perccli /cx[/ex]/sx set jbod

This command converts unconfigured good drive to Non-RAID disks.

Input example:

```
perccli /c1/e56/s3 set jbod
```

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

This drive changes the drive state to unconfigured good. If the drive has the operating system in it, use the force option.

Input example:

```
perccli /c1/e56/s3 set good
```

perccli /cx[/ex]/sx set offline

This command changes the drive state to offline.

Input example:

```
perccli /c1/e56/s3 set offline
```

perccli /cx[/ex]/sx set online

This command changes the drive state to online.

Input example:

```
perccli /c1/e56/s3 set online
```

perccli /cx[/ex]/sall set jbod

This command converts all unconfigured good drives to Non-RAID disks.

Input example:

```
perccli /c1/e56/sall set jbod
```

perccli /cx[/ex]/sx-y set jbod

This command converts all the selected unconfigured good drives to Non-RAID disks.

Input example:

```
perccli /c1/e56/s1-6 set jbod
```

Locate drives commands

The PERC Command Line Tool supports the following commands to locate a drive and activate the physical disk activity LED:

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

The detailed description for each command follows.

perccli /cx[/ex]/sx start locate

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

Input example:

```
perccli /c0/e56/s1 start locate
```

perccli /cx[/ex]/sx stop locate

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

Input example:

```
perccli /c0/e56/s1 stop locate
```

Prepare to remove drives commands

The PERC CLI supports the following commands to prepare the physical drive for removal:

```
perccli /cx[/ex]/sx spindown
perccli /cx[/ex]/sx spinup
```

The detailed description for each command follows.

perccli /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:

```
perccli /cx/e34/s4 spindown
```

perccli /cx[/ex]/sx spinup

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

Input example:

```
perccli /cx/e34/s4 spinup
```

Dimmer switch commands

The PERC Command Line Tool supports the following command to change the dimmer switch setting. The dimmer switch is the power saving policy on the drives.

Change drive power settings commands

perccli /cx set dimmerswitch|ds=<on|off type=1|2|3|4>

This command changes the power-saving properties on a controller for drives. See dimmer switch in the following table for values.

Input example:

```
perccli /c0 set ds=on type=1
```

Below is the list of combination of dimmer switch commands:

```
perccli /cx set ds=off type=1|2|3|4
perccli /cx set ds=on type=1|2 [properties]
perccli /cx set ds=on type=3|4 defaultldtype=<val> [properties]
perccli /cx set ds [properties]
```

Table 9. Dimmer switch command options

Options	Value range	Description
`dimmerswitch or ds`	on|off	Turns the dimmer switch option on or off.
`type`	1. Unconfigured 2. Hot spare 3. Virtual drive 4. All	Specifies the type of drives that the dimmer switch feature is applicable. By default, it is activated for unconfigured drives, hot spare drives and virtual drives.
`defaultldtype`	• `auto`: Logical device power savings are managed by the firmware. • `none`: No power saving policy. • `max`: Logical device uses maximum power savings. • `maxnocache`: Logical device does not cache write to maximize power savings.	Specifies the default logical drive type that is created by the dimmer switch option; set to none automatically.
`properties`	• `disableldps`: Interval in hours or time, example: `disableldps=hh:mm interval=hh` • `SpinUpEncDrvCnt`: Valid enclosure number (0 to 255). • `SpinUpEncDelay`: Valid time in seconds. • `SpinDownTime=30-1440(min)`	• Sets the interval or time in which the power saving policy for the logical drive is turned off. • Specifies the number of drives in the enclosure that are spun up. • Specifies the delay of spin-up groups within an enclosure in seconds. • Sets the time of the drive to spin down on no activity of the drive.

Drive security commands

The PERC Command Line supports the following drive security command:

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

This command shows the key ID of the controller.

Input example:

```
perccli /c0/s4 show securitykey keyid
```

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

This command sets the security key on JBOD or Non-RAID disks.

Input example:

```
perccli /c0/e2/s4 set security=on
```

perccli /cx[/ex]/sx show jbod

This command shows the summary of the non-RAID disks/JBOD drive for specified slot in the controller.

Input example:

```
perccli /c0/e2/s4 show jbod
```

perccli /cx[/ex]/sx show jbod all

This command shows all information of a non-RAID disks/JBOD drive for the specified slot in the controller. The `all` option in the command shows information for all slots on the controller. `x` stands for a number, a list of numbers, a range of numbers, or all numbers.

Input example:

```
perccli /c0/e2/s4 show jbod all
```

Drive erase commands

Table 10. Conventions

Options	Description
`/cx`	Specifies a controller where `x` is the controller index.
`/ex`	Specifies an enclosure where `x` is the enclosure device ID.
`/sx`	Specifies a physical drive where `x` is the slot number.

The PERC Command Line supports the following drive erase commands:

```
perccli /cx[/ex]/sx secureerase[force]
perccli /cx[/ex]/sx stop erase
perccli /cx[/ex]/sx show erase
perccli /cx[/ex]/sx start erase[simple|normal|thorough|standard|threepass|crypto]
[patternA=<val>][patternB=<val>]
```

The detailed description for each command follows.

perccli /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:

```
perccli /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.

perccli /cx[/ex]/sx stop erase

Stops secure erase on non-SED drives.

perccli /cx[/ex]/sx show erase

Displays the status as percentage of secure erase completed.

perccli /cx[/ex]/sx start erase [simple| normal| thorough| standard| threepass| crypto] [patternA=<val>] [patternB=<val>]

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

Table 11. Drive erase command options

Options	Value range	Description
`cx[/ex]/sx`	—	• /cx - specifies a controller where X is the controller index. • /ex - specifies an enclosure where X is the enclosure device ID. • /sx - specifies a physical drive where X is the slot number.
`erase`	• simple: Single pass, single pattern write. • normal: Three pass, three pattern write. • thorough: Nine pass, repeats the normal write three times. • standard: Applicable only for Dell Form Factors. • threepass: Threepass, pass1 random pattern write, pass 2, 3 write zero, verify.	Secure erase type.
`crypto`	-	Applicable only for ISE capable drives.
`patternA`	8-bit value	Erase pattern A to overwrite the data.
`patternB`	8-bit value	Erase pattern B to overwrite the data.

Input example:

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

Rebuild drives commands

The following commands rebuild drives in the PERC Command Line Tool:

```
perccli /cx[/ex]/sx pause rebuild
perccli /cx[/ex]/sx resume rebuild
perccli /cx[/ex]/sx show rebuild
perccli /cx[/ex]/sx start rebuild
perccli /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.

perccli /cx[/ex]/sx pause rebuild

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

Input example:

```
perccli /c0/s4 pause rebuild
```

perccli /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:

```
perccli /c0/s4 resume rebuild
```

perccli /cx[/ex]/sx show rebuild

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

Input example:

```
perccli /c0/s5 show rebuild
```

perccli /cx[/ex]/sx start rebuild

This command starts a rebuild operation for a drive.

Input example:

```
perccli /c0/s4 start rebuild
```

perccli /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:

```
perccli /c0/s4 stop rebuild
```

Drive copyback commands

The PERC Command Line Tool supports the following commands for drive copyback:

```
perccli /cx[/ex]/sx pause copyback
perccli /cx[/ex]/sx resume copyback
perccli /cx[/ex]/sx show copyback
perccli /cx[/ex]/sx start copyback target=e:s
perccli /cx[/ex]/sx stop copyback
```

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

perccli /cx[/ex]/sx pause copyback

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

Input example:

```
perccli /c0/e25/s4 pause copyback
```

perccli /cx[/ex]/sx resume copyback

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

Input example:

```
perccli /c0/e25/s4 resume copyback
```

perccli /cx[/ex]/sx show copyback

This command shows the progress of the copyback operation in percentage.

Input example:

```
perccli /c0/e25/s4 show copyback
```

perccli /cx[/ex]/sx start copyback target=e:s

This command starts a copyback operation for a drive.

Input example:

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

perccli /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:

```
perccli /c0/e25/s4 stop copyback
```

NOTE: A stopped rebuild process cannot be resumed.

Hot spare drive commands

The following commands create and delete hot spare drives:

```
perccli /cx[/ex]/sx add hotsparedrive [DGs=<N|0,1,2...>][enclaffinity][nonrevertible]
perccli /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.

perccli /cx[/ex]/sx add hotsparedrive [DGs=<N|0,1,2...>] [enclaffinity] [nonrevertible]

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

Table 12. Add hotsparedrive 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, there is no affinity. **NOTE:** Affinity cannot be removed after it is set for a hot spare drive.
nonrevertible	-	Sets the drive as a nonrevertible hotspare.

perccli /cx[/ex]/sx add hotsparedrive

This command adds a hot spare drive.

Input example:

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

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

Input example:

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

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

perccli /cx[/ex]/sx delete hotsparedrive

This command deletes a hot spare drive.

Input example:

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

Virtual drives commands

The PERC Command Line Tool supports the following virtual drive commands. The following table describes frequently used virtual drive commands.

Table 13. Virtual drives commands quick reference table

Commands	Value range	Description
add	See Add RAID 0 configuration input options.	Creates virtual drives.
delete	force: Deletes the virtual drive where operating system is present.	Deletes a virtual drive.
set	See Add RAID 0 configuration input options and Change virtual drive properties commands.	Sets virtual drive properties.
show	all: Shows all properties of the virtual drive.	Shows virtual drive information.

Add virtual drives commands

The PERC Command Line Tool supports the following commands to add virtual drives:

```
perccli /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,e:s-x,y,z [PDperArray=x][SED]
        [pdcache=on|off|default][pi][DimmerSwitch(ds)=default|automatic(auto)|
        none|maximum(max)|MaximumWithoutCaching(maxnocache)][wt|wb|fwb][nora|ra]
        [direct|cached] [CachedBadBBU|NoCachedBadBBU] [cachevd][unmap]
        [Strip=<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|7]

 perccli /cx add vd each r0 [name=<VDNAME1>,..] [drives=e:s|e:s-x|e:s-x,y]
        [SED] [pdcache=on|off|default][pi] [DimmerSwitch(ds)=default|
        automatic(auto)|none|maximum(max)|MaximumWithoutCaching(maxnocache)]
        [wt|wb|fwb] [nora|ra][direct|cached] [CachedBadBBU|NoCachedBadBBU]
        [Strip=<64|128|256|512|1024>] [EmulationType=0|1|2] [ExclusiveAccess]
        [Cbsize=0|1|2 Cbmode=0|1|7]
```

Table 14. Add RAID configuration input options

Option	Value range	Description
rXX	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 is the range convention used to represent slots. s to x in the enclosure e
pdperarray	0 to 15	Specifies the number of physical drives per array. The default value is automatically chosen.

Table 14. Add RAID configuration input options (continued)

Option	Value range	Description
sed	—	Creates security-enabled drives.
pdcache	on|off|default	Enables or disables PD cache.
pi	—	Enables protection information.
dimmerswitch	• default: Logical device uses controller default power-saving policy. • automatic (auto): Logical device power savings are managed by firmware. • none: No power-saving policy. • maximum (max): Logical device uses maximum power savings. • MaximumWithoutCaching (maxnocache): Logical device does not cache write to maximize power savings.	Specifies the power-saving policy. Sets to default automatically.
wt|wb	• wt: Write through. • wb: Write back.	Enables write through. Write back is the default.
nora|ra	• ra: Read ahead • nora: No read ahead	Disables read ahead. Enabled is the default.
cachedbadbbu|nocachedbadbbu	• cachedbadbbu: Enable bad BBU caching. • nocachedbadbbu: Disable bad BBU caching	Enables caching when BBU is not functioning. Disabled is the default.
strip	8, 16, 32, 64, 128, 256, 512, 1024	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.

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

This command creates a RAID 0 configuration for each disk specified in the `drives` option. You can use the following options to create the RAID volume:

Table 15. Add RAID 0 configuration input options

Option	Value range	Description
type	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 target. • s represents the disk slot number. • e:s-x is the range of disk slot numbers.

Table 15. Add RAID 0 configuration input options (continued)

Option	Value range	Description
		• `e:s-x,y` is the range of disk slot numbers plus the disk with a slot number out of the specified range. If you replace `s-x` with `0-9`, it will provide 10 RAID 0 virtual disks with each using one disk.
`pdperarray`	0 to 15.	Specifies the number of physical drives per array. The default value is automatically chosen.
`sed`	—	Creates security-enabled drives.
`pdcache`	`on|off|default`	Enables or disables PD cache.
`pi`	—	Enables protection information.
`dimmerswitch`	• `default`: Logical device uses controller default power-saving policy. • `automatic (auto)`: Logical device power savings are managed by firmware. • `none`: No power-saving policy. • `maximum (max)`: Logical device uses maximum power savings. • `MaximumWithoutCaching (maxnocache)`: Logical device does not cache write to maximize power savings.	Specifies the power-saving policy. Sets to default automatically.
`wt|wb`	• `wt`: Write through. • `wb`: Write back.	Enables write through. Write back is the default.
`nora|ra`	• `ra`: Read ahead. • `nora`: No read ahead.	Disables read ahead. Enabled is the default.
`cachedbadbbu|nocachedbadbbu`	• `cachedbadbbu`: Enable bad BBU caching. • `nocachedbadbbu`: Disable bad BBU caching.	Enables caching when BBU is not functioning.Disabled is the default.
`strip`	`8, 16, 32, 64, 128, 256, 512, 1024`	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 the addition of a security-capable physical drive to a drive group without security.

Input example:

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

Delete virtual drives commands

The PERC Command Line Tool supports the following virtual drive delete commands:

```
perccli /cx/vx|vall del
perccli /cx/vx|vall del 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.

perccli /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:

```
perccli /c0/v2 del
```

NOTE: This command deletes virtual drives. Data located on these drives will no longer be accessible.

perccli /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:

```
perccli /c0/v2 del force
```

NOTE: 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

Delete non-RAID disks

The PERC Command Line Tool supports the following non-RAID disks delete commands:

```
perccli /cx[/ex]/sx del jbod [force]
perccli /cx[/ex]/sall del jbod [force]
perccli /cx[/ex]/sx-y del jbod [force]
```

This command deletes a particular non-RAID disk (listed as JBOD drive) or when the `sall` option is used, all the non-RAID disks on the controller are deleted. The `x` stands for a number, list of numbers, range of numbers, or all numbers. The `force` option should be used only if the user needs to delete a non-RAID drive with any partition.

Virtual drive show commands

The PERC Command Line Tool supports the following virtual drive show commands:

```
perccli /cx/vx show
perccli /cx/vx show all
```

The detailed description for each command follows.

perccli /cx/vx show

This command shows the summary of the virtual drive information.

Input example:

```
perccli /c0/v0 show
```

perccli /cx/vx show all

This command shows all virtual drive information, which includes virtual drive information, physical drives used for the virtual drives, and virtual drive properties.

Input example:

```
perccli /c0/v0 show all
```

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 PERC Command Line Tool supports the following commands for preserved cache:

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

The detailed description for each command follows.

perccli /cx/vx delete preservedcache

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

Input example:

```
perccli /c0/v1 delete preservedcache
```

perccli /cx show preservedCache

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

Input example:

```
perccli /c0 show preservedCache
```

Change virtual drive properties commands

NOTE: In the following, `/cx` specifies the controller, where `x` is the controller index, while `/vx` specifies the virtual drive, where x is the virtual drive ID.

The PERC Command Line Tool supports the following commands to change virtual drive properties:

```
perccli /cx/vx set accesspolicy=RW|RO|Blocked|RmvBlkd
perccli /cx/vx set bootdrive=<on|off>
perccli /cx/vx set cbsize=0|1|2 cbmode=0|1|7
perccli /cx/vx set ds=Default|Auto|None|Max|MaxNoCache
perccli /cx/vx set iopolicy=Cached|Direct
perccli /cx/vx set name=<NameString>
perccli /cx/vx set pdcache=On|Off|Default
perccli /cx/vx set pi=Off
perccli /cx/vx set rdcache=RA|NoRA
perccli /cx/vx set wrcache=WT|WB|FWB
```

The detailed description for each command follows.

perccli /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 rmvblkd (remove blocked).

Input example:

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

Options:

```
RW - Access is Read Write
RO - Access is Read Only
Blocked - Access is Blocked
RmvBlkd - Remove Blocked Access
```

perccli /cx/vx set bootdrive=<on|off>

Sets or unsets a virtual drive as the boot drive.

NOTE: Set bootdrive is applicable only in legacy BIOS mode.

Input example:

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

perccli /cx/vx set cbsize=0|1|2 cbmode=0|1|7

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

Input example:

```
perccli /c0/v0 set cbsize=0 cbmode=7
```

Options:

cbsize:

0 — 64k cache bypass

1 — 128k cache bypass

2 — 256k cache bypass

cbmode:

0 — Enable intelligent mode cache bypass

1 — Enable standard mode cache bypass

7 — Disable cache bypass

perccli /cx/vx set ds=<Default|Auto|None|Max|MaxNoCache>

This command changes the power-saving properties on a virtual drive.

Input example:

```
perccli /c0/v0 set ds=Default
```

Options:

Default — Controller default power saving options are applied

Auto — Power savings is managed by firmware

None — Power savings is disabled

Maximum — Maximum power savings options are applied

MaxNoCache — Maximum power savings with no caching of writes are applied

perccli /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:

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

Options:

Cached — I/Os are cached

Direct — I/Os are not cached

NOTE: Cache policy on PERC 10 and 11 controllers is set to Direct I/O by default. Cached I/O policy is not supported.

perccli /cx/vx set name=<NameString>

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

Options:

NameString — VD name

perccli /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:

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

Options:

On — Enables pd caching

Off — Disables pd caching

Default —pd caching is set to default

perccli /cx/vx set pi=Off

This command disables the data protection of a virtual drive.

Input example:

```
perccli /cx/vx set pi=Off
```

Options:

Off — Disables data protection

perccli /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:

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

Options:

RA= Read ahead

NORA = No read ahead

perccli /cx/vx set wrcache=<WT|WB|FWB>

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

Input example:

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

Options:

WT — Write through

WB — Write back

FWB — Force write back even in case of bad BBU

Virtual drive initialization commands

The PERC Command Line Tool supports the following commands to initialize virtual drives:

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

NOTE: If the virtual drive has 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.

perccli /cx/vx show init

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

Input example:

```
perccli /c0/v2 show init
```

perccli /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:

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

perccli /cx/vx stop init

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

Input example:

```
perccli /c0/v0 stop init
```

Virtual drive erase commands

The PERC Command Line Tool supports the following command to erase virtual drives:

perccli /cx/vx erase [force]

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

Input example:

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

NOTE: If the virtual drive has user data, you must use the `force` option to erase the virtual drive. A virtual drive with a valid MBR and partition table is considered to contain user data.

perccli /cx/vx show erase

This command shows the progress of drive's security configuration and erases data in percentage.

Input example:

```
perccli /c0/v1 show erase
```

perccli /cx/vx stop erase

This command stops the erase operation.

Input example:

```
perccli /c0/v1 stop erase
```

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

This command securely erases virtual drives. The drive is written with erase patterns to ensure that the data is securely erased. You can use the following options with the start erase command:

Table 16. Virtual drive erase command options

Options	Value range	Description
cx/vx	—	• /cx: specifies a controller where X is the controller index. • /vx: specifies the virtual drive where X is the virtual drive ID.
erase	• simple: Single pass, single pattern write • normal: Three pass, three pattern write • thorough: Nine pass, repeats the normal write three times • threepass: Threepass, pass1 random pattern write, pass 2, 3 write zero, verify	Secure erase type
patternA	8-bit value	Erase pattern A to overwrite the data.
patternB	8-bit value	Erase pattern B to overwrite the data.

NOTE: patternA and patternB are 8 bit binary values, that can be defined by the user. It should be used with conjunctions with one of the secure erase types like simple, normal, thorough, standard, or pass.

Virtual drive migration commands

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

The PERC Command Line Tool supports the following commands for virtual drive migration (reconstruction):

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

The detailed description for each command follows.

perccli /cx/vx show migrate

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

Input example:

```
perccli /c0/v0 show migrate
```

perccli /cx/vx start migrate type=raidx [option=add|remove drives=[e:] s| [e:]s-x| [e:]s-x,y] [Force]

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

Table 17. Virtual drive migration command options

Options	Value range	Description
`type=raidx`	`RAID [0|1|5|6|10]:`	The RAID level to which the virtual drive must be migrated.
`[option=add|remove drives=[e:]s| [e:]s-x|[e:]s-x,y] [Force]`	• `add`: Adds the specified PD to the migrated raid level. • `remove`: Removes the specified PD from the migrated raid level. • `drives`: Specifies the list of PD's which needs to be added or removed. • `force`: If specified, then migration will start even if any drive in the DG is secured by FDE	-

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

Table 18. Virtual drive migration table

Initial RAID level	Migrated RAID level
RAID 0	RAID 0
RAID 0	RAID 1
RAID 0	RAID 5
RAID 0	RAID 6
RAID 1	RAID 0
RAID 1	RAID 5
RAID 1	RAID 6
RAID 5	RAID 0
RAID 5	RAID 5
RAID 5	RAID 6
RAID 6	RAID 0
RAID 6	RAID 5
RAID 6	RAID 6
RAID 10	RAID 10

Input example:

```
perccli /c0/v3 start migrate type=r5 option=add drives=134:1-3
```

Virtual drive consistency check commands

The PERC Command Line Tool supports the following commands for virtual drive consistency checks:

```
perccli /cx/vx pause cc
perccli /cx/vx resume cc
perccli /cx/vx show cc
```

```
perccli /cx/vx start cc [force]
perccli /cx/vx stop cc
```

The detailed description for each command follows.

perccli /cx/vx pause cc

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

Input example:

```
perccli /c0/v4 pause cc
```

perccli /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:

```
perccli /c0/v4 resume cc
```

perccli /cx/vx show cc

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

Input example:

```
perccli /c0/v5 show cc
```

perccli /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:

```
perccli /c0/v4 start cc
```

NOTE: A consistency check does not run on RAID 0 virtual disks.

perccli /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:

```
perccli /c0/v4 stop cc
```

NOTE: You cannot resume a stopped consistency check process.

Background initialization commands

The PERC Command Line Tool supports the following commands for background initialization:

```
perccli /cx/vx resume bgi
perccli /cx/vx set autobgi=on|off
perccli /cx/vx show autobgi
perccli /cx/vx show bgi
```

```
perccli /cx/vx stop bgi
perccli /cx/vx pause bgi
```

NOTE: The background initialization (BGI) does not run on RAID 0 virtual disks.

The detailed description for each command follows.

perccli /cx/vx resume bgi

This command resumes a suspended background initialization operation.

Input example:

```
perccli /c0/v0 resume bgi
```

perccli /cx/vx set autobgi=on|off

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

Input example:

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

perccli /cx/vx show autobgi

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

Input example:

```
perccli /c0/v0 show autobgi
```

perccli /cx/vx show bgi

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

Input example:

```
perccli /c0/v0 show bgi
```

perccli /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:

```
perccli /c0/v4 stop bgi
```

perccli /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:

```
perccli /c0/v4 pause bgi
```

Virtual drive expansion commands

The PERC Command-Line Tool supports the following commands for virtual drive expansion:

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

The detailed description for each command follows.

`perccli /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. The value of the expand size is in MB. If the `expandarray` option is specified, the existing array is expanded. If this option is not specified, the virtual drive is expanded.

perccli /cx/vx show expansion

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

Input example:

`perccli /c0/v0 show expansion`

Foreign configurations commands

The PERC Command Line Tool supports the following commands to view, import, and delete foreign configurations:

```
perccli /cx/fx|fall del|delete [ securitykey=sssssssssss ]
perccli /cx/fx|fall import [preview][ securitykey=ssssssssssss ]
perccli /cx/fx|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.

The detailed description for each command follows.

perccli /cx/fx|fall del| delete [securitykey=sssssssssss]

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

Input example:

`perccli /c0/fall delete`

perccli /cx/fx|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:

`perccli /c0/fall import`

perccli /cx/fx|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:

```
perccli /c0/fall show foreign
perccli /c0/fall import preview
perccli /c0/fall show all
```

BIOS-related commands

The PERC Command Line Tool supports the following BIOS commands:

```
perccli /cx set bios [state=<on|off>] [Mode=<SOE|PE|IE|SME>] [abs=<on|off>]
[DeviceExposure=<value>]
perccli /cx show bios
```

The detailed description for each command follows.

perccli /cx set bios [state=<on|off>] [Mode=<SOE|PE|IE|SME>] [abs=<on|off>] [DeviceExposure=<value>]

This commands sets the BIOS controller property to on or orr. The Mode sets the BIOS boot mode.

Only the following combinations are supported:

- perccli /cx set bios state=<on|off>
- perccli /cx set bios Mode-<SOE|PE|IE|SME>
- perccli /cx set bios abs=<on|off>
- perccli /cx set bios DeviceExposure=<value>

Table 19. BIOS-related commands

Variable	Description
SOE	Stop on errors
PE	Pause on errors
IE	Ignore errors
SME	Safe mode on errors
abs	Enables|Disables the auto boot select
DeviceExposure	Number of devices to be exposed: value range is 0–255
value 0 and 1	Expose all
value 2	255: Actual number of devices to be exposed

Input example:

```
perccli /c0 set bios abs=on
```

perccli /cx show bios

This command displays the value of the controller BIOS.

Input example:

```
perccli /c0 show bios
```

OPROM BIOS commands

The PERC Command Line Tool supports the following OPROM BIOS commands:

```
perccli /cx[/ex]/sx set bootdrive=on|off
perccli /cx/vx set bootdrive=on|off
perccli /cx show bootdrive
```

The detailed description for each command follows.

perccli /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. The eHBA mode supports setting a Non-RAID disk as a boot drive.

Input example:

```
perccli /c0[/e32]/s4 set bootdrive=on
```

perccli /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:

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

perccli/cx/vx show bootdrive

This command shows the boot drive for the controller. The boot drive can be a physical drive or a virtual drive. The existing configured boot drives will be displayed.

Input example:

```
perccli /c0/v0 show bootdrive
```

Drive group commands

This section describes the drive group commands.

Drive group show

The PERC Command Line Tool supports the following drive group commands:

```
perccli /cx/dx show
perccli /cx/dx show all
perccli /cx/dall show mirror
perccli /cx/dall split mirror
perccli /cx/dall add mirror src=<val> [force]
perccli /cx/dx set security=on
```

NOTE: In the following, `/cx` specifies the controller where `x` is the controller index, while the value `/dx` specifies the disk group where `x` is the disk group index.

perccli /cx/dx show

This command shows the topology information of the drive group.

Input example:

```
perccli /c0/dall show
```

perccli /cx/dall show mirror

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

Input example:

```
perccli /c0/dall show mirror
```

perccli /cx/dall split mirror

This command splits apart the mirror virtual drives.

Input example:

```
perccli /c0/dall split mirror
```

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

This command joins the virtual drive with its mirror.

Input example:

```
perccli /c0/dall add mirror src=<2>
```

Options for <val>:

- 0 — Data will be copied from existing virtual drive to drives.
- 1 — Data will be copied from drives to virtual drive.
- 2 — Broken mirror is imported as a new virtual drive.

perccli /cx/dx set security=on

This command enables security on the specified drive group.

Input example:

```
perccli /c0/d0 set security=on
```

perccli /cx/dx show all

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

Input example:

```
perccli /c0/dall show all
```

BBU commands

The PERC Command Line Tool supports the following battery backup unit (BBU) commands:

```
perccli /cx/bbu set [learnDelayInterval=<val>|bbuMode=<val>|learnStartTime=[DDDHH|off]|
autolearnmode=<val>|powermode=sleep|writeaccess=sealed]
perccli /cx/bbu show
perccli /cx/bbu show all
perccli /cx/bbu show learn
perccli /cx/bbu show properties
perccli /cx/bbu show status
perccli /cx/bbu start learn
```

In the following, `/cx` specifies a controller where `x` is the controller index, and `/bbu` signifies a battery backup unit.

The detailed description for each command follows:

perccli /cx/bbu set <options>

This command sets bbu properties on the controller bbu.

Options:

- learnDelayInterval=<val>: number of hours to delay a learn cycle, not greater than 7 days
- bbuMode=<val>: val range 0–255
- autolearnmode=<val>: 0 — Enabled, 1 — Disabled, 2 — WarnViaEvent

- learnStartTime=[DD HH|off>: DDD — day of week {SUN, MON, . . . SAT} HH — 0–23 hours, off: Sets learn start to OFF
- powermode=sleep
- writeaccess=sealed

perccli /cx/bbu show

This command shows the summary information for the BBU of a controller.

Input example:

```
perccli /c0/bbu show
```

perccli /cx/bbu show all

This command shows all the information of a BBU.

Input example:

```
perccli /c0/bbu show all
```

perccli /cx/bbu show learn

perccli /cx/bbu show properties

This command shows the BBU Learn properties for a controller.

Input example:

```
perccli /c0/bbu show properties
```

perccli /cx/bbu show status

This command shows summary information for the BBU of a controller.

Input example:

```
perccli /c0/bbu show status
```

perccli /cx/bbu start learn

This command starts the BBU learning cycle.

Input example:

```
perccli /c0/bbu start learn
```

Enclosure commands

The PERC Command Line Tool supports the following enclosure commands:

```
perccli /cx/ex show
perccli /cx/ex show all
perccli /cx/ex show phyerrorcounters
perccli /cx/ex show status
```

NOTE: If the cables fail or are removed, then the enclosure IDs may change.

The detailed description for each command follows.

perccli /cx/ex show

Input example:

```
perccli /c1/e1 show
```

perccli /cx/ex show all

This command shows the status of each model in the enclosure.

Input example:

```
perccli /c0/e0 show all
```

perccli /cx /ex show phyerrorcounters

Input example:

```
perccli /c0 /e0 show phyerrorcounters
```

perccli /cx/ex show status [extended]

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

Input example:

```
perccli /c0/e0 show status
```

PHY commands

The PERC Command Line Tool supports the following PHY commands:

```
perccli /cx/px|pall set linkspeed=0(auto)|1.5|3|6|12
perccli /cx/px|pall show
perccli /cx/px|pall show all
```

The detailed description for each command follows.

perccli /cx/px|pall set linkspeed=0(auto)|1.5|3|6|12

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

Input example:

```
perccli /c0/p0 set linkspeed=1.5
```

perccli /cx/px|pall show

This command shows the basic PHY layer information.

Input example:

```
perccli /c1/p0 show
```

perccli /cx/px|pall show all

This command shows all the PHY layer information.

Input example:

```
perccli /c1/p0 show all
```

Logging commands

The PERC Command Line Tool supports the following commands to generate and maintain log files:

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

The detailed description for each command follows.

perccli /cx delete events

This command deletes all records in the event log.

Input example:

```
perccli /c0 delete events
```

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

This command prints the system log to a text file and saves the file in the specified location.

Input example:

```
perccli /c0 show events file=C:\Users\Administrator\Documents\eventreport
```

Table 20. Logging commands

Option	Value Range	Description
Type	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 (ConsistencyCheck) 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.
Filter	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 events.
Logfile	-	If the file name is not specified, it logs to storSAS.log to provide.

perccli /cx show eventloginfo

This command shows the history of log files generated.

Input example:

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

PERC CLI command examples

You can use the Dell PowerEdge RAID Controller (PERC) Command Line Interface (CLI) to manage RAID controllers, configure PERC cards, and perform a variety of controller and enclosure specific operations.

Getting a complete list of CLI commands

To view a full list of available CLI commands, use one of the following CLI commands:

perccli64.exe –help > [filename]

perccli64.exe –? > [filename]

Checking controller availability

Syntax

```
perccli show
```

Description

Displays information about the adapter and the operating system.

Result

```
Status Code = 0
Status = Success
Description = none

Number of Controllers = 1
Host name = WIN-RFV0S1VAILB
Operating System = Windows Server 2012

System Overview :
===============
-----------------------------------------------------------------------------
Ctl Model     Ports  PDs  DGs  DNOpt  VDs  VNOpt  BBU  sPR  DS  EHS  ASOs
-----------------------------------------------------------------------------
 0  Adapter     8     9    2     0     2     0    Fld  On  3    N    0
-----------------------------------------------------------------------------
```

Viewing controllers

Syntax

```
perccli  show ctrlcount
```

Description

Displays the number of controllers detected in the server.

Result

```
Status Code = 0
Status = Success
Description = None

Controller Count = 1
```

Viewing free space information

Syntax

```
perccli /c0  show freespace
```

Description

Displays the free space details of the controller.

Result

```
Status Code = 0
Status = Success
Description = None

FREE SPACE DETAILS :
==================
Total Slot Count = 0
ID-Index|DG-Drive Group|AftrVD-Identify Freespace After VD
```

Viewing disk1 information

Syntax

```
perccli /c0/d1 show
```

Description

Displays information about disk1.

Result

```
Controller = 0
Status = Success
Description = Show Diskgroup Succeeded

TOPOLOGY :
```

```
========
--------------------------------------------------------------------------------
DG Arr Row EID:Slot DID  Type  State  BT        Size  PDC  PI SED DS3  FSpace
--------------------------------------------------------------------------------
1  -   -   -        -    RAID0 Opt1   N   558.375 GB  dflt N   Y   dflt  N
1  0   -   -        -    RAID0 Opt1   N   558.375 GB  dflt N   Y   dflt  N
1  0   0   32:2     2    DRIVE Onln   N   558.375 GB  dflt N   Y   dflt  -
--------------------------------------------------------------------------------
```

Viewing controller, virtual disk, and drivers information

Syntax

```
perccli /c0 show
```

Description

Displays information about the adapter, virtual disks, and drivers.

Result

```
Status Code = 0
Status = Success
Description = none

Product Name = PERC H730P Adapter
Serial Number = 38E005K
SAS Address = 5b8ca3a0f78d9000
Mfg. Date = 08/28/13
System Time = 11/30/2013 05:12:51
Controller Time = 11/30/2013 05:13:29
FW Package Build = 25.2.0.0014
BIOS Version = 6.12.00_4.12.05.00_0x06020101
FW Version = 4.220.00-2918
Driver Name = PercSas3.sys
Driver Version = 6.600.52.00
Controller Bus Type = N/A
PCI Slot = N/A
PCI Bus Number = 4
PCI Device Number = 0
PCI Function Number = 0
Drive Group = 2

TOPOLOGY :
========
-------------------------------------------------------------------------------
DG Arr Row EID:Slot DID Type  State  BT        Size  PDC  PI SED DS3  FSpace
-------------------------------------------------------------------------------
0  -   -   -        -   RAIDS Opt1   N     1.635 TB  dflt  N  V  dflt  N
0  0   -   -        -   RAIDS Opt1   N     1.635 TB  dflt  N  V  dflt  N
0  0   0   32:0     0   DRIVE Onln   N   558.375 GB  dflt  N  V  dflt  -
0  0   1   32:1     1   DRIVE Onln   N   558.375 GB  dflt  N  V  dflt  -
0  0   2   32:3     3   DRIVE Onln   N   558.375 GB  dflt  N  V  dflt  -
0  0   3   32:4     4   DRIVE Onln   N   558.375 GB  dflt  N  V  dflt  -
1  -   -   -        -   RAID0 Opt1   N   558.375 GB  dflt  N  V  dflt  N
1  0   -   -        -   RAID0 Opt1   N   558.375 GB  dflt  N  V  dflt  N
1  0   0   32:2     2   DRIVE Onln   N   558.375 GB  dflt  N  V  dflt  -
-------------------------------------------------------------------------------

Virtual Drives = 2

VD LIST :
=======
--------------------------------------------------------------------
```

```
DG/VD  Type  State  Access  Consist  Cache  sCC       Size  Name
-------------------------------------------------------------------
0/0    RAID5 Opt1   RW      Yes      RWTD   -     1.635 TB
1/1    RAID0 Opt1   RW      Yes      RWTD   -   558.375 GB  Test
-------------------------------------------------------------------

Physical Drives = 9

PD LIST :
=======
---------------------------------------------------------------------------
EID:Slt DID State  DG        Size  Intf Med SED PI SeSz  Model        Sp
---------------------------------------------------------------------------
32:0    0   Onln   0   558.375 GB  SAS  HDD Y   Y  4 KB  ST600MP0084   U
32:1    1   Onln   0   558.375 GB  SAS  HDD Y   Y  4 KB  ST600MP0084   U
32:2    2   Onln   1   558.375 GB  SAS  HDD Y   N  512B  ST600MP0054   U
32:3    3   Onln   0   558.375 GB  SAS  HDD Y   Y  4 KB  ST600MP0084   U
32:4    4   Onln   0   558.375 GB  SAS  HDD Y   Y  4 KB  ST600MP0084   U
32:5    5   UGood  -   558.375 GB  SAS  HDD N   N  512B  ST600MP0034   U
32:6    6   UGood  -   558.375 GB  SAS  HDD Y   N  512B  ST600MP0054   U
32:7    7   UGood  -   558.375 GB  SAS  HDD N   N  512B  ST600MP0034   U
32:18   18  UGood  -   558.375 GB  SAS  HDD Y   N  512B  ST600MP0054   U
---------------------------------------------------------------------------

Cachevault_info :
===============
-------------------------------------
Model  State  Temp  Mode  MfgDate
-------------------------------------
BBU    Failed 76C   -     2011/07/18
-------------------------------------
```

Checking for preserved cache

Syntax

```
perccli /c0  show preservedcache
```

Description

Displays available preserved cache.

Result

```
Controller = 0
Status = Success
Description = None

------------
VD  State
------------
0   Missing
------------
```

Deleting preserved cache

Syntax

```
perccli /c0/v1  delete preservedcache
```

Description

Deletes the available preserved cache.

Result

```
Controller = 0
Status = Success
Description = Virtual Drive preserved Cache Data Cleared
```

Viewing expansion information

Syntax

```
perccli /c0/v0  show expansion
```

Description

Displays virtual drive's expansion information with and without array expansion.

Result

```
Controller = 0
Status = Success
Description = None

EXPANSION INFORMATION :
=====================
-------------------------------------------------
VD      Size  OCE  NoArrExp  WithArrExp  Status
-------------------------------------------------
0   1.635 TB  N    -         -           -
-------------------------------------------------
VD - Virtual drive | OCE - Online Capacity Expansion | WithArrExp - With Array Expansion
NoArrExp - Without Array Expansion
```

Example

```
Controller = 0
Status = Success
Description = None

EXPANSION INFORMATION :
=====================
-------------------------------------------------
VD      Size  OCE  NoArrExp  WithArrExp  Status
```

```
-----------------------------------------------
236  24.388 GB Y    -         -           -
-----------------------------------------------
VD - Virtual drive | OCE - Online Capacity Expansion | WithArrExp - With Array Expansion
NoArrExp - Without Array Expansion
```

Viewing expansion size

Syntax

```
perccli /c0/v236 expand size=10
```

Description

Expands the virtual drive within the existing array.

Example

```
Controller = 0
Status = Success
Description = expansion operation succeeded

EXPANSION INFORMATION :
======================
-------------------------------------------------------------------------------------------
---
VD      Size      FreSpc    ReqSize    AbsUsrSz  %FreSpc   NewSize    Status   NoArrExp
-------------------------------------------------------------------------------------------
---
236  9.765 GB  734.859 GB  10.000 MB   7.347 GB     1     17.113 GB     -     734.859
GB
-------------------------------------------------------------------------------------------
---
VD - Virtual drive |Size - Current VD size | FreSpc - Freespace available before
expansion |
AbsUsrSz - User size rounded to nearest % | %FreSpc - Requested expansion size in % of
available free space | NoArrExp - Without Array Expansion
```

NOTE: The percentage %FreSpc is calculated by computing (input value of size/free space in the array) * 100 which is rounded to the nearest percentage. This value is used to compute the AbsUsrSz by multiplying (%FreSpc with the free space) in the array. The NewSize of the virtual drive or array is calculated by adding the current size of the virtual drive or array with the AbsUsrSz value.

Viewing the foreign configuration

Syntax

```
perccli /c0/fall show
```

Description

Displays the foreign configuration of the selected controller.

Result

```
Controller = 0
Status = Success
Description = Operation on foreign configuration Succeeded

FOREIGN CONFIGURATION :
======================
---------------------------------------
DG EID:Slot Type  State     Size NoVDs
---------------------------------------
 0 -        RAID0 Frgn  372.0 GB     1
---------------------------------------

NoVDs - Number of VDs in disk group|DG - Diskgroup
Total foreign drive groups = 1
```

Importing the foreign configuration

Syntax

```
perccli /c0/fall import
```

Description

Imports the foreign configurations of the selected controller.

Result

```
Controller = 0
Status = Success
Description = Successfully imported foreign configuration
```

Viewing BBU information

Syntax

```
perccli /c0/bbu show all
```

Description

Displays information related to the Battery Backup Unit (BBU) of a controller.

Result

```
Controller = 0
Status = Success
Description = None

BBU_Info :
========
-----------------------
```

```
Property      Value
----------------------
Type           BBU
Voltage        3 mV
Current        0 mA
Temperature    32 C
Battery State  Optimal
----------------------

BBU_Firmware_Status :
====================
--------------------------------------------------
Property                                          Value
--------------------------------------------------
Charging Status                                   None
Voltage                                           OK
Temperature                                       OK
Learn Cycle Requested                             No
Learn Cycle Active                                No
Learn Cycle Status                                OK
Learn Cycle Timeout                               No
I2C Errors Detected                               No
Battery Pack Missing                              No
Replacement required                              No
Remaining Capacity Low                            No
Periodic Learn Required                           No
Transparent Learn                                 No
No space to cache offload                         No
Pack is about to fail & should be replaced No
Cache Offload premium feature required     No
Module microcode update required           No
--------------------------------------------------

GasGaugeStatus :
==============
-------------------------------------
Property                    Value
-------------------------------------
Fully Discharged            Yes
Fully Charged               Yes
Discharging                 No
Initialized                 No
Remaining Time Alarm        No
Remaining Capacity Alarm    Yes
Terminate Discharge Alarm   No
Over Temperature            No
Charging Terminated         No
Over Charged                No
Relative State of Charge    100%
Charger System State        Complete
Remaining Capacity          407
Full Charge Capacity        407
Is SOH Good                 Yes
Battery backup charge time 0 hour(s)
-------------------------------------

BBU_Capacity_Info :
=================
--------------------------------------------------------
Property                  Value
--------------------------------------------------------
Relative State of Charge 100%
Absolute State of charge 0%
Remaining Capacity       407 mAh
Full Charge Capacity     407 mAh
Run time to empty        Battery is not being charged
Average time to empty    33 min
Average Time to full     Battery is not being charged
Cycle Count              3
Max Error                0%
Remaining Capacity Alarm 0 mAh
Remaining Time Alarm      0 minutes(s)
--------------------------------------------------------
```

```
BBU_Design_Info :
===============
-----------------------------------
Property                Value
-----------------------------------
Date of Manufacture     18/07/2011
Design Capacity         90 mAh
Design Voltage          0 mV
Specification Info      0
Serial Number           0
Pack Stat Configuration 0
Manufacturer's Name
Device Name
Device Chemistry
Battery FRU             N/A
Transparent Learn       1
App Data                0
Module Version          0.3
-----------------------------------

BBU_Properties :
==============
---------------------------------------------------------------
Property             Value
---------------------------------------------------------------
Auto Learn Period    90d (7776000 seconds)
Next Learn time      2014/02/19  12:44:32 (446129072 seconds)
Learn Delay Interval 0 hour(s)
Auto-Learn Mode      Transparent
---------------------------------------------------------------
```

Viewing physical drive details for the specified slot in the controller

Syntax

```
perccli /c0/e32/s4 show all
```

Description

Displays information about the physical drive, including device attribute, settings, and port information for a particular slot in the controller.

Result

```
Controller = 0
Status = Success
Description = Show Drive Information Succeeded.

Drive /c0/e32/s4:
================
-------------------------------------------------------------------------------
EID:Slt  DID  State  DG        Size  Intf  Med  SED  PI  SeSz  Model        Sp
-------------------------------------------------------------------------------
32:4     4    Onln   0   558.375 GB  SAS   HDD  Y    Y   4 KB  ST600MP0084  U
-------------------------------------------------------------------------------
EID-Enclosure Device ID|Slt-Slot No.|DID-Device ID|DG-Drive Group
DHS-Dedicated Hot Spare|UGood-Unconfigured Good|GHS-Global Hotspare
UBad-Unconfigured Bad|Onln-Online|Offln-Offline|Intf-Interface
Med-Media Type|SED-Self Encryption Drive|PI-Protection Info
SeSz-Sector Size|Sp-Spun|U-Up|D-Down|T-Transition|F-Foriegn
```

```
UGUnsp-Unsupported

Drive /c0/e32/s4 - Detailed Information :
========================================
Drive /c0/e32/s4 State :
========================
Shield Counter = 0
Media Error Count = 0
Other Error Count = 0
Drive Temperature = 43c <109.40F>
Predictive Failure Count = 0
S.M.A.R.T alert flagged by drive = No

Drive /c0/e32/s4 Device attribute :
===================================
SN = S2G01H5T
WWN = 5000C5006B1A4FB8
Firmware Revision = VB44
Raw size = 558.911 GB [0x8bba5f6 Sectors]
Coerced size = 558.375 GB [0x8b98000 Sectors]
Non Coerced size = 558.411 GB [0x8b9a5f6 Sectors]
Device Speed = 6.0Gb/s
Link Speed = 6.0Gb/s
Logical Sector Size = 4 KB
Physical Sector Size = 4 KB

Drive /c0/e32/s4 Policies/Settings :
====================================
Drive position = DriveGroup:0, Span:0, Row:3
Enclosure Position = 0
Connected Port Number = 0<path0>
Sequence Number = 2
Commissioned Spare = No
Emergency Spare = No
Last Predictive Failure Event Sequence Number = 0
Successful diagnostics completion on = N/A
SED Capable = Yes
SED Enabled = Yes
Secured = Yes
Locked = No
Needs EKM Attention = No
PI Eligible = Yes
Drive is formatted for PI = Yes
PI type = 2
Number of bytes of user data in LBA = 4 KB
Certified = Yes
Wide Port Capable = No

Port Information :
================
---------------------------------------------
Port  Status  Linkspeed  SAS address
---------------------------------------------
  0   Active  6.0Gb/s    0x5000c5006b1a4fba
  1   Active  6.0Gb/s    0x0
---------------------------------------------

Inquiry Data =
00 00 06 12 8b 01 30 02 53 45 41 47 41 54 45 20
53 54 36 30 30 4d 50 30 30 38 34 20 20 20 20 20
56 42 34 34 53 32 47 30 31 48 35 54 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 43 6f 70 79 72 69 67 68 74 20 28 63 29 20 32
30 31 33 20 53 65 61 67 61 74 65 20 41 6c 6c 20
```

Viewing the boot drive for the controller

Syntax

```
perccli /c0 show bootdrive
```

Description

Displays the boot drive for the controller. The boot drive can be a physical drive or a virtual drive.

Result

```
Controller = 0
Status = Success
Description = None

Controller Properties :
======================
-----------------
Ctrl_Prop  Value
-----------------
BootDrive  VD:13
-----------------
```

Setting virtual drive as boot drive

Syntax

```
perccli /c0/v13 set bootdrive = on
```

Description

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.

NOTE: Set bootdrive is applicable only in legacy BIOS mode and is not supported in UEFI mode.

Result

```
Controller = 0
Status = Success
Description = None


Detailed Status :
===============
-----------------------------------------------
VD  Property   Value  Status   ErrCd  ErrMsg
-----------------------------------------------
13  Boot Drive  On    Success     0    -
-----------------------------------------------
```

Locating a drive

Syntax

```
perccli /c0/e32/s0  start locate
```

Description

Locates a drive and activates the physical disk activity LED.

Result

```
Controller = 0
Status = Success
Description = Start Drive Locate Succeeded
```

Stopping a locate operation

Syntax

```
perccli /c0/e32/s0  stop locate
```

Description

Stops a drive locate operation and deactivates the physical disk activity LED.

Result

```
Controller = 0
Status = Success
Description = Stop Drive Locate Succeeded
```

Snapdump commands

The PERC Command Line Tool supports the following commands for snapdump state, save count, collection, and deletion.

NOTE: The PERC H345 controller can hold a maximum of one snapdump at a time.

```
perccli /cx show snapdump
perccli /cx set snapdump state=on|off
perccli /cx set snapdump [ savecount=<value> | delayocr=<value> ]
perccli /cx get snapdump [ id=[ all | <value> file=<filename>] ] [norttdump]
perccli /cx delete snapdump force
```

The detailed description for each command follows.

perccli /cx show snapdump

This command shows the snapdump information on the controller.

Input example:

```
perccli /c0 show snapdump
```

perccli /cx set snapdump state=on|off

This command set enables or disables the snapdump on the controller.

- On - Enables snapdump on the controller.
- Off - Disables the snapdump on the controller.

Input example:

```
perccli /c0 set snapdump state = on
```

NOTE: Once snapdump is disabled on the controller it will persist through the updates and reboot until it is enabled.

perccli /cx set snapdump [savecount=<value> | delayocr=<value>]

This command sets the properties of snapdump information on the controller.

Input example:

```
perccli /c0 set snapdump savecount=20 delayocr=20
```

Table 21. Snapdump commands

Option	Value Range	Description
savecount	0-255	Number of times snapdump persists on the controller across reboots.
delayocr	15-60	Number of seconds that the driver delays the OCR to allow the snapdump logs to be collected.

The default values for savecount and delayocr are 4 and 15 respectively. The savecount option is not applicable for PERC 11 controllers as it is always persistent on PERC 11 controllers.

perccli /cx get snapdump [id=[all | <value> file=<filename>]] [norttdump]

This command gets the controller snapdump data and saves the data to a file. Only the following combinations are supported:

- perccli /c0 get snapdump [norttdump]
- perccli /c0 get snapdump id=all [norttdump]
- perccli /c0 get snapdump id=<value> file=fileName [norttdump]

Input example:

```
perccli /c0 get snapdump id=0 file=Snapdump.zip
```

Table 22. Snapdump commands

Option	Value Range	Description
ID	all | specifc ID	ID of the snapdump from the data displayed with show snapdump command. • if all is specified all available snapdumps will be extracted in zip format. • if ID suboption is not specified, then a support log download generation request is submitted and all snapdumps are downloaded, including on demand snapdumps.
filename	User specificed	file to be saved in zip format and later to be extracted.
norttdump	-	norrttdump is applicable only for windows. By default driver dump is saved to a file in windows. if norttdump is specified driver dump will not be saved.

perccli /cx delete snapdump force

This command deletes the controller snapdump information.

- force - Deletes all the snapdumps present on the controller.

Input example:

```
perccli /c0 delete snapdump force
```

4

Getting help

Topics:

Recycling or End-of-Life service information

Take back and recycling services are offered for this product in certain countries. If you want to dispose of system components, visit www.dell.com/recyclingworldwide and select the relevant country.

Contacting Dell

Dell provides online and telephone based support and service options. If you do not have an active internet connection, you can find Dell contact information on your purchase invoice, packing slip, bill or Dell product catalog. The availability of services varies depending on the country and product, and some services may not be available in your area. To contact Dell for sales, technical assistance, or customer service issues:

1. Go to www.dell.com/support/home.
2. Select your country from the drop-down menu on the lower right corner of the page.
3. For customized support:
   a. Enter the system Service Tag in the **Enter a Service Tag, Serial Number, Service Request, Model, or Keyword** field.
   b. Click **Submit**.
   The support page that lists the various support categories is displayed.
4. For general support:
   a. Select your product category.
   b. Select your product segment.
   c. Select your product.
   The support page that lists the various support categories is displayed.
5. For contact details of Dell Global Technical Support:
   a. Click Global Technical Support.
   b. The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

Locating the Express Service Code and Service Tag

The unique Express Service Code and Service Tag is used to identify the system.

The information tag is located on the front of the system rear of the system that includes system information such as Service Tag, Express Service Code, Manufacture date, NIC, MAC address, QRL label, and so on. If you have opted for the secure default access to iDRAC, the Information tag also contains the iDRAC secure default password. If you have opted for iDRAC Quick Sync 2, the Information tag also contains the OpenManage Mobile (OMM) label, where administrators can configure, monitor, and troubleshoot the PowerEdge servers.

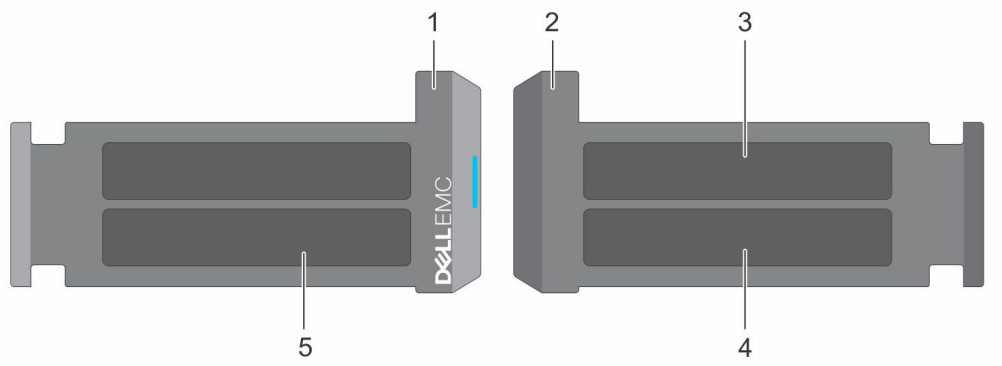

Figure 1. Locating the Express Service Code and Service tag

1. Information tag (front view)
2. Information tag (back view)
3. OpenManage Mobile (OMM) label
4. iDRAC MAC address and iDRAC secure password label
5. Service Tag, Express Service Code, QRL label

The Mini Enterprise Service Tag (MEST) label is located on the rear of the system that includes Service Tag (ST), Express Service Code (Exp Svc Code), and Manufacture Date (Mfg. Date). The Exp Svc Code is used by Dell to route support calls to the appropriate personnel.

Alternatively, the Service Tag information is located on a label on left wall of the chassis.

Receiving automated support with SupportAssist

Dell SupportAssist is an optional Dell Services offering that automates technical support for your Dell server, storage, and networking devices. By installing and setting up a SupportAssist application in your IT environment, you can receive the following benefits:

- Automated issue detection — SupportAssist monitors your Dell devices and automatically detects hardware issues, both proactively and predictively.
- Automated case creation — When an issue is detected, SupportAssist automatically opens a support case with Dell Technical Support.
- Automated diagnostic collection — SupportAssist automatically collects system state information from your devices and uploads it securely to Dell. This information is used by Dell Technical Support to troubleshoot the issue.
- Proactive contact — A Dell Technical Support agent contacts you about the support case and helps you resolve the issue.

The available benefits vary depending on the Dell Service entitlement purchased for your device. For more information about SupportAssist, go to www.dell.com/supportassist.

5

Documentation resources

This section provides information about the documentation resources for your system.

To view the document that is listed in the documentation resources table:

- From the Dell support site:
  1. Click the documentation link that is provided in the Location column in the table.
  2. Click the required product or product version.

     NOTE: To locate the product name and model, see the front of your system.
  3. On the Product Support page, click **Manuals & documents**.
- Using search engines:
  - Type the name and version of the document in the search box.

Table 23. Additional documentation resources for your system

Task	Document	Location
Setting up your system	For more information about installing and securing the system into a rack, see the Rail Installation Guide included with your rail solution. For information about setting up your system, see the *Getting Started Guide* document that is shipped with your system.	www.dell.com/poweredgemanuals
Configuring your system	For information about the iDRAC features, configuring and logging in to iDRAC, and managing your system remotely, see the Integrated Dell Remote Access Controller User's Guide. For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM CLI Guide for iDRAC. For information about Redfish and its protocol, supported schema, and Redfish Eventing implemented in iDRAC, see the Redfish API Guide. For information about iDRAC property database group and object descriptions, see the Attribute Registry Guide. For information about Intel QuickAssist Technology, see the Integrated Dell Remote Access Controller User's Guide.	www.dell.com/poweredgemanuals
	For information about earlier versions of the iDRAC documents. To identify the version of iDRAC available on your system, on the iDRAC web interface, click **?** > **About**.	www.dell.com/idracmanuals

Table 23. Additional documentation resources for your system (continued)

Task	Document	Location
	For information about installing the operating system, see the operating system documentation.	www.dell.com/operatingsystemmanuals
	For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	www.dell.com/support/drivers
Managing your system	For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.	www.dell.com/poweredgemanuals
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	www.dell.com/openmanagemanuals > OpenManage Server Administrator
	For information about installing, using, and troubleshooting Dell OpenManage Enterprise, see the Dell OpenManage Enterprise User's Guide.	https://www.dell.com/openmanagemanuals
	For information about installing and using Dell SupportAssist, see the Dell SupportAssist Enterprise User's Guide.	https://www.dell.com/serviceabilitytools
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	www.dell.com/openmanagemanuals
Understanding event and error messages	For information about the event and error messages generated by the system firmware and agents that monitor system components, go to qrl.dell.com > **Look Up** > **Error Code**, type the error code, and then click **Look it up**.	www.dell.com/qrl
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	www.dell.com/poweredgemanuals