User Guide

DM-CLI

Western Digital

Customer Solutions Team

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Conventions

The following icon and text conventions are used throughout this document to identify additional information of which the reader should be aware.

|  |  |
| --- | --- |
| **Conventions** | **Description** |
| CAUTION | C:\Users\jrau\Desktop\PM Template\Caution.png | This icon denotes the use of extreme caution and the user must exercise good judgment according to previous experience before advancing to the next procedure. The icon also indicates the existence of a hazard that could result in equipment or property damage, or equipment failure if the instructions are not observed. |
| NOTE | C:\Users\jrau\Desktop\Temp\CheckMark.tif | This icon denotes additional or related information that the user may find useful. It also identifies any information that relates to the safe operation of the equipment, software, or related items. |
| **Bold**. | **Text** | Used to indicate **important technical notes**. |
| ***Bold Italic*** | ***Text*** | Used to indicate ***critical instructions***. |
| *Light Blue Italic* | *Text* | Used to indicate a hyperlink or “jump” to a related topic or subtopic. In addition, the text may be **bold**. |

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Revision History

| **Revision** | **Date** | **Page(s)** | **Description** |
| --- | --- | --- | --- |
| 1.0 | 07/11/2018 | All | Initial release. |
| 1.0.3 | 08/28/2018 | All | Updated for dm-cli v1.0.3+* Changed meta reference dm to dm-cli
* Removed references to old commands
* Configure-trace command => config
 |
| 1.0.4 | 9/6/2018 | i-ii | Added legal disclaimer, updated cover page |
| 1.0.5 | 1/19/2019 | Many | Updated document numbers and document release dates.  |
| 7 | Updated supported products table for Ultrastar® SN 630 |
| 32 | Added Configure-trace command. |
| 47 | Updated supported log pages for Ultrastar® SA210 and Ultrastar® SN630 |
| 1.2 | 3/12/2019 | 66 | Added --type option to help text output |
| 84 | Updated the option table for the self-test command.  |
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| 51 | Added 0xD0 log page support. |
| 71 | Added –enable and --disable option to manage-uefi command. |
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| 28 | Added –d option to help text output |
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| 1.6 | 13/03/2020 | 7 | Updated supported products table for Ultrastar DC SN840 |
| 52 | Added 0xDE,0xF1 and 0xF2 log page support  |

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# Scope

## Overview

The Device Manager Command Line Interface (DM-CLI) is designed to efficiently assist in the administration of Western Digital enterprise-class Ultrastar® Solid-State Drive (SSD) devices. While many IT organizations have embraced the benefits of solid-state technology, many of the current hard disk drive utilities have proven woefully inadequate in the management of enterprise solid-state devices. DM-CLI provides the ability to easily update, manage, and configure enterprise SSDs.

## Audience

This user guide is intended for system administrators, network administrators, and other IT professionals. It is therefore written specifically for a technically advanced audience; it is not intended for end-users that will eventually purchase the commercially available product. The *user*, as referenced throughout this guide, is primary concerned with industrial, commercial and enterprise networking applications.

## Supported Products

DM-CLI can discover and manage the following SSDs as outlined in **Table 1: Supported Products**.

|  |  |
| --- | --- |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | DM-CLI *1.x.x requires that Firmware Version KMGNP110 or later be installed on the SN100 or SN150 Series SSDs; otherwise, the execution of the* resize*,* reset-to-defaults *and* manage-namespaces *commands will return an error.* |

Table 1: Supported Products

|  |  |
| --- | --- |
| **Product Family** | **Description** |
| Ultrastar SN100 | SN100 NVMe™ PCIe 3.0 x4 Lane 2.5-Inch SFF Solid-State Drives |
| Ultrastar SN150 | SN150 NVMe PCIe 3.0 x4 Lane HH-HL Edge Card Solid-State Drives |
| Ultrastar SN200 | SN200 NVMe PCIe 3.0 x4 Lane 2.5-Inch SFF Solid-State Drives |
| Ultrastar SN260 | SN260 NVMe PCIe 3.0 x8 Lane HH-HL Edge Card Solid-State Drives |
| Ultrastar SSD800MH | Ultrastar 2.5-Inch 12Gbps SAS-3 SFF MLC HE Solid-State Drives |
| Ultrastar SSD800MM | Ultrastar 2.5-Inch 12Gbps SAS-3 SFF MLC ME Solid-State Drives |
| Ultrastar SSD800MH.B | Ultrastar 2.5-Inch 12Gbps SAS-3 SFF MLC HE Solid-State Drives |
| Ultrastar SSD1000MR | Ultrastar 2.5-Inch 12Gbps SAS-3 SFF MLC RI Solid-State Drives |
| Ultrastar SSD1600MM | Ultrastar 2.5-Inch 12Gbps SAS-3 SFF MLC ME Solid-State Drives |
| Ultrastar SSD1600MR | Ultrastar 2.5-Inch 12Gbps SAS-3 SFF MLC RI Solid-State Drives |
| Ultrastar SS300 | Ultrastar 2.5-Inch 12Gbps SAS-3 SFF MLC and TLC Solid-State Drives |
| Ultrastar DS SS300 | Ultrastar 2.5-Inch 12Gbps SAS-3 SFF MLC and TLC Solid-State Drives |
| Ultrastar DS SS540 | Ultrastar 2.5-Inch 12Gbps SAS-3 SFF MLC and TLC Solid-State Drives |
| Ultrastar SA210 | Ultrastar SA210 6Gbps SATA TLC Solid-State Drives |
| Ultrastar DC SN630 | SN630 NVMe PCIe 3.0 x4 Lane 2.5-Inch SFF Solid-State Drives |
| Ultrastar DC SN640 | SN640 NVMe PCIe 3.0 x4 Lane 2.5-Inch SFF Solid-State Drives |
| CL SN720 | SN720 NVMe PCIe 3.0 x4 Lane 2.5-Inch SFF Solid-State Drives |
| Ultrastar DC SN340 | SN340 NVMe PCIe 3.0 x4 Lane 2.5-Inch SFF Solid-State Drives |
| Ultrastar DC SN740/ Ultrastar DC ZN740 | SN740/ZN740 NVMe PCIe 3.0 x4 Lane 2.5-Inch SFF Solid-State Drives |
| Ultrastar DC SN840 | SN840 NVMe PCIe 3.0 x4 Lane 2.5-Inch SFF Solid-State Drives |

## Supported Controllers and Expanders

DM-CLI can discover and manage Serial Attached SCSI (SAS) and Serial ATA (SATA) SSDs managed by the following controllers outlined in Table 2: Supported Controllers and Expanders.

Table 2: Supported Controllers and Expanders

|  |  |
| --- | --- |
| **Vendor** | **Family** |
| Broadcom® | SAS/SATA 92xx Host Bus Adapters (6Gb/s) |
| Broadcom | SAS/SATA 93xx Host Bus Adapters (12Gb/s) |

# Installation

## Overview

This section addresses issues regarding the compatibility, system requirements, installation and configuration of DM-CLI.

|  |  |
| --- | --- |
|  | ***Ultrastar PCIe NVMe drives require an NVMe driver to function. Most operating systems supported by*** DM-CLI ***provide an inbox NVMe driver. Western Digital also provides an NVMe driver for Linux and Windows.*** DM-CLI ***is compatible with all Western Digital NVMe drivers as well as NVMe drivers for all supported Linux® operating systems.*** DM-CLI ***is not compatible with inbox NVMe drivers for Windows operating systems due to the limitations of these drivers.*** |
|  |  |

## Installation Packages

DM-CLI installers are available for a variety of platforms. It is the responsibility of the user to be knowledgeable of the specific platform on which DM-CLI will be installed. An authorized representative will e-mail the desired version of DM-CLI to the user, or the user may download the package(s) from the Western Digital Support website. The packages must be unpacked in a default directory or a temporary directory. It is recommended that the user create the default or temporary directories off the root of the drive hierarchy. Table 3: Installation Packages lists the available installer packages and descriptions.

|  |  |
| --- | --- |
|  | ***The installer will check whether the prerequisite packages are present before continuing the installation.*** |
|  | ***The installation packages are only compatible with 64-bit systems.*** |

Table 3: Installation Packages

|  |  |
| --- | --- |
| **Installation Package** | **Description** |
| dmcli-core-1.x.x-win64.msi | For Windows 64-bit platforms |
| dmcli-core-1.x-x.-x86\_64.rpm | For RHEL®-based Linux 64-bit x86 platforms |
| dmcli-core-1.x-x.-amd64.deb | For Debian-based Linux 64-bit x86 platforms |
| **Note: x = build number** |

## Prerequisites

|  |  |
| --- | --- |
| C:\Users\jrau\Desktop\PM Template\Caution.png | ***The prerequisite platform or software described below should be installed and configured before you install*** DM-CLI***.*** |
|  |  |

## Supported Operating Systems

|  |  |
| --- | --- |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | DM-CLI *1.x.x only supports the kernels that are supplied with the operating systems distributed by the OS vendors. If the user should compile any other kernel versions into the operating systems, then the configuration shall not be considered officially supported by* DM-CLI*.* |

Table 4: Supported Operating Systems

|  |  |
| --- | --- |
| **Operating System** | **Description** |
| Red Hat Enterprise Linux® (RHEL) | RHEL 6.8, and 6.9 x86\_64 architecture (inbox kernel) |
|  | RHEL 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 8.0 x86\_64 architecture (inbox kernel) |
| Community Enterprise Linux (CentOS) | CentOS 7,8.1 x86\_64 architecture (inbox kernel) |
| SUSE Linux Enterprise Server (SLES) | SLES 12, 12 SP1, 12 SP2,12 SP 3,12 SP 4 and 12 SP 5 x86\_64 architecture (inbox kernel)SLES 15 SP1 x86\_64 architecture (inbox kernel) |
| Ubuntu Server Linux | Ubuntu 14.04 LTS, 15.04, 16.04 LTS, 16.10, 17.04 ,17.10 and Ubuntu 18.04 LTS x86\_64, architecture (inbox kernel) |
| Microsoft Windows | Windows 7 ,64-bitWindows server 2008 R2,64-bitWindows Server 2012 64-bitWindows Server 2012 R2, 64-bit.Windows Server 2016, 64-bit,Windows server 2019 ,64-bit |
|  | Windows 8 and 8.1, 64-bit |
|  | Windows 10, 64-bit |

## Event Logging

DM-CLI supports the use of event logging as a method of tracking drive health and operation. Event messages are usually logged to and operating system event log such as the Event Viewer (Windows) or /var/log/syslog (Linux).

## Supported Drivers

|  |  |
| --- | --- |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *When using* DM-CLI *1.x and the HGST NVMe Windows driver to manage Ultrastar SN200 series SSDs, driver version 2.0.1701.2716 or newer must be used, and version 2.0.1707.1319 or newer is recommended. The corresponding driver file names will be prefixed by “HGST-NVMe-2017020716”.* |
|  |  |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *When using* DM-CLI *1.x and the HGST NVMe Windows driver to manage Ultrastar SN100 or SN150 SSDs, and not Ultrastar SN200 series SSDs, driver version 1.0.1.50625 or newer must be used. The corresponding driver file names will be prefixed by “HGST-NVMe-10150625”.* |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *It is strongly recommended to upgrade Host Bus Adapters (HBAs) or RAID controllers to the latest driver.* |

Table 6: Supported Drivers

|  |  |
| --- | --- |
| **Prerequisite** | **Description** |
| HGST NVMe Windows Driver | Windows NVMe Driver provided by HGST. |
| **Note**: DM-CLI is not compatible with Windows In-box NVMe drivers due to the limitations of these drivers. |
| Linux In-box NVMe Drivers | NVMe drivers included with Linux Distributions. |
| HBA and RAID controller Drivers | Drivers provided by vendors of Host Bus Adapters and RAID controllers. |

## RHEL Linux RPM Installation

To install the DM-CLI RPM package on a RHEL-based system:

1. Logon to the system with root privileges.
2. Create a temporary installation folder or directory.
3. Download the DM-CLI installable (RPM) file to the temporary installation folder or directory. [See Installation Packages to determine which rpm file to download](#_Installation_Packages).
4. Open a terminal window and change directories to the temporary installation folder or directory.
5. Use the rpm command to install the RPM file, e.g., rpm -ivh <DM-CLI *RPM file name*>

To update the DM-CLI RPM package currently installed on the system:

1. Logon to the system with root privileges.
2. Create a temporary installation folder or directory.
3. Download the DM-CLI installable (RPM) file to the temporary installation folder or directory. [See Installation Packages to determine which rpm file to download](#_Installation_Packages).
4. Open a terminal window and change directories to the temporary installation folder or directory.
5. Use the rpm command to update the RPM file, e.g., rpm -Uvh <DM-CLI *RPM file name*>

To uninstall the DM-CLI RPM package currently installed on the system:

1. Logon to the system with root privileges.
2. Open a terminal window or console.
3. Run rpm -e <DM-CLI-core>

## SLES Linux RPM Installation

To install the DM-CLI RPM package on a SLES-based system:

1. Logon to the system with root privileges.
2. Create a temporary installation folder or directory.
3. Download the DM-CLI installable (RPM) file to the temporary installation folder or directory. [See Installation Packages to determine which rpm file to download](#_Installation_Packages).
4. Open a terminal window and change directories to the temporary installation folder or directory.
5. Use the zypper command to install the RPM file, e.g., zypper install <DM-CLI *RPM file name*>

To update the DM-CLI RPM package currently installed on the system:

1. Logon to the system with root privileges.
2. Create a temporary installation folder or directory.
3. Download the DM-CLI installable (RPM) file to the temporary installation folder or directory. [See Installation Packages to determine which rpm file to download](#_Installation_Packages).
4. Open a terminal window and change directories to the temporary installation folder or directory.
5. Use the zypper command to update the RPM file, e.g., zypper update <DM-CLI *RPM file name*>

To uninstall the DM-CLI RPM package currently installed on the system:

1. Logon to the system with root privileges.
2. Open a terminal window or console.
3. Run zypper remove <DM-CLI-core>

## Ubuntu Linux DEB Installation

To install the DM-CLI DEB package or to update the DM-CLI DEB package currently installed on the system:

1. Logon to the system with root privileges.
2. Create a temporary installation folder or directory.
3. Download the DM-CLI installable (DEB) file to the temporary installation folder or directory. [See Installation Packages to determine which deb file to download](#_Installation_Packages).
4. Open a terminal window and change directories to the temporary installation folder or directory.
5. Use the dpkg command to install or update the DEB file, e.g., dpkg -i <DM-CLI *DEB file name*>

To uninstall the DM-CLI DEB package currently installed on the system:

1. Logon to the system with root privileges.
2. Open a terminal window or console.
3. Run dpkg -r <DM-CLI-core>

**CentOS Linux RPM Installation**

To install the DM-CLI RPM package on a CentOS-based system:

1. Logon to the system with root privileges.
2. Create a temporary installation folder or directory.
3. Download the DM-CLI installable (RPM) file to the temporary installation folder or directory. [*See Installation Packages to determine which rpm file to download*](#_Installation_Packages).
4. Open a terminal window and change directories to the temporary installation folder or directory.
5. Use the rpm command to update the RPM file, e.g., yum install <DM-CLI RPM file name>

To update the DM-CLI RPM package currently installed on the system:

1. Logon to the system with root privileges.
2. Create a temporary installation folder or directory.
3. Download the DM-CLI installable (RPM) file to the temporary installation folder or directory. [See Installation Packages to determine which rpm file to download](#_Installation_Packages).
4. Open a terminal window and change directories to the temporary installation folder or directory.
5. Use the rpm command to update the RPM file, e.g., yum upgrade <DM-CLI *RPM file name*>

To uninstall the DM-CLI RPM package currently installed on the system:

1. Logon to the system with root privileges.
2. Open a terminal window or console.
3. Run yum remove <DM-CLI-core>

## Windows Installation

|  |  |
| --- | --- |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | ***The user must install the HGST In-house Driver before using*** DM-CLI ***to manage Western Digital devices under Windows.*** |

To install DM-CLI under Windows:

1. Logon to the system with Administrator privileges.
2. Create a temporary installation folder or directory.
3. Download the DM-CLI msi file to the temporary installation folder or directory.
4. Double-click the **Installer Package (msi)**.

**Notes**:

1. If a Microsoft SmartScreen filter message appears informing you that the package being installed cannot be verified, click **More Information** and then allow the package to be installed.
2. Enter any administrative credentials if so prompted.
3. The DM-CLI Setup Window appears.
4. Click **Next** to continue. The End-User License Agreement will appear.
5. Review the terms of the EULA and then place a check mark in the **I accept the terms in the License Agreement** check box.
6. Click **Next** to continue. You are prompted to choose the location of the working directory. The default path will appear in the text box, but you can use the **Change…** option to navigate to an alternate installation directory.
7. Click **Next** to continue. You are now prompted to install DM-CLI.
8. Click **Install**. The DM-CLI will be installed.

### Uninstall Procedure

To uninstall DM-CLI:

1. Open the Control Panel window.
	1. Navigate to the Add/Remove Programs panel, or;
	2. Navigate to the Programs and Features panel.
2. Click the application “DM-CLI” in the list to select it.
3. Click the Uninstall button.
4. Confirm the removal of DM-CLI.

### Installation Notes

The user will notice that after DM-CLI is installed:

1. All the DM-CLI-related files are contained in the installation path that was specified in the Setup Wizard.
2. The **Add/Remove Programs** panel or **Programs and Features** panel under the **Control Panel** will contain the application of “DM-CLI”.
3. All command execution for the CLI requires the use of a terminal / command window and administrator privileges.

# Command Line Interface

## Overview

This section explains the usage and capabilities of the Command Line Interface (CLI) and provides basic and advanced device management and diagnostic functions. The CLI can also be used in situations where automated tasks can be compiled as scripts or batch files.

## Command Execution

The syntax for command execution is consistent across the various platforms. In this section, the commands are presented in the platform neutral form of **dm-cli**. Most DM-CLI commands require root or administrator privileges. The user should have a practical knowledge of navigating the command line interface for the specific system platform.

## Command Syntax

The commands and options use the same syntax across the platforms. The spaces or delimiters are taken literally, while the brackets are ignored:

**dm-cli** <command> <command arguments> <device references>

Where **dm-cli** is a “meta” command that invokes the various management or administrative commands, while <command> is the actual operation.

### Command Arguments

The <command arguments> may consist of zero or multiple combinations of options or flags. An option is considered an input parameter that requires a user supplied value, while flags modify the command behavior.

### Device References

A *device-reference* describes how a device is accessed when executing a command and may be expressed as shown in **Table 7: Device References**. *See* [Linux Directory Trees vs. Windows Device Instance IDs](#PathReferences).

Table 7: Device References

|  |  |  |
| --- | --- | --- |
| **Argument** | **Description** | **Example** |
| --uid (–u) | The unique identifier (UID) of the device. | --uid 1C58CJH0020002F8HUSMR7616BHP3010023 |
| --path (–p) | The OS native path or device instance ID. | --path /dev/nvme0 |
| --alias (-a) | The DM-CLI internal alias. | --alias myssd01 |

**Notes**:

1. The unique identifieris device specific and DM-CLI uses the following unique identifiers:
	1. NVMe Controllers: A concatenation of the PCI Vendor ID, Serial Number, Model Number, and Controller ID (Identify Controller Structure).
	2. NVMe Namespaces: IEEE Extended Unique Identifier (EUI64) (Identify Namespace Structure).
	3. SAS Drives: WWNN.
	4. SATA Drives: WWNN.
2. While the most intuitive method may be to reference a device using the OS native path, the enumeration of the devices, the controller paths, and namespaces may change after a reboot.

### Device Reference Examples

For example, the user may want to obtain the properties of a device using the get-info command. The user must therefore specify the [device-reference](#Device_Reference); the OS path, an alias or a device unique identifier.

#### OS Path Example

The ***<device-reference>*** argument is the **OS path** and follows the *--path* input option:

dm-cli get-info --path ***/dev/nvme0***

#### Alias Example

The ***<device-reference>*** argument is the **alias** that was assigned to the device and follows the *--alias* input option:

dm-cli get-info --alias ***myssd01***

#### Device Unique Identifier Example

The ***<device-reference>*** argument is the **device unique identifier** assigned to the device and follows the *--uid* input option:

dm-cli get-info --uid ***1C58CJH0020002F8HUSMR7616BHP3010023***

### Linux Directory Trees vs. Windows Device Instance IDs

It is important to understand that Linux and Windows manage devices using different methods. Linux implements the /dev/ directory tree scheme where the /dev/ directory tree contains all the “device” files. Examples of device paths on Linux systems are: /dev/nvme0 and /dev/sda

However, under Windows, DM-CLI uses the device instance paths or device instance IDs assigned by the system. A device instance ID is a unique identification string assigned by the Plug and Play (PnP) Manager to each device node in the device tree. The format of the string consists of an instance ID concatenated to a device ID, i.e., <device-ID>\<instance-specific-ID>. The device instance ID is persistent across system restarts. An example of a Windows device instance ID is: \\?\pci#ven\_1c58&dev\_0023&subsys\_00031c58&rev\_05
#4&11cc8299&0&0009#{2accfe60-c130-11d2-b082-00a0c91efb8b}

These entities are shown in the output of most DM-CLI commands using the Device Path property.

### Short Form Syntax

**Table 8: Short Form Syntax** lists the “short form” syntax that is available for the following <command args> (command arguments).

Table 8: Short Form Syntax

|  |  |  |
| --- | --- | --- |
| **Long Form** | **Short Form** | **Example** |
| --output-format FORMAT | -o | dm-cli get-state **-o** mini --path /dev/nvme0 |
| --config PATH | -c | dm-cli get-state **–c** $HOME/dm.ini --path /dev/nvme0 |
| --path PATH | -p | dm-cli get-state **-p** /dev/nvme0 |
| --uid UID | -u | dm-cli get-state **–u** 1C58CJH0020002F8HUSMR7616BHP3010023 |
| --alias ALIAS | -a | dm-cli get-state **–a** myssd01 |
| --file FILE | -f | dm-cli config **–f** nvme0trace --level 3 |
| --interval INTERVAL | -i | dm-cli get-statistics **–i** 14 --category performance--path /dev/nvme0 |
| --wait | -w | dm-cli secure-purge **–w** --path /dev/nvme0 |

### Configuration Files

The --config PATH or –c option allows the user to specify a configuration file other than the default. The option expects the user to specify the path to the configuration file, dm.ini. The configuration file is usually located in the $**HOME/.dm directory by default**. If the user does not specify $HOME, then the current directory is used.

|  |  |
| --- | --- |
|  | ***The*** --config PATH ***option is for advanced usage and is not recommended for normal situations.*** |

### Listing the Installed Devices

The first command that the user should run is **dm-cli scan**. The **dm-cli scan** command will list information about all DM-CLI supported devices that are installed in the host system and currently recognized by the operating system. These names can then be used in the execution of subsequent commands. For example, **get-info** can use either the {--path PATH |--uid UID |--alias ALIAS} options to extract drive information.

[user@host]$dm-cli scan

[1C58CJH0020002F8HUSMR7616BHP3010023]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Vendor Name = HGST

 Model Name = HUSMR7616BHP301

 Vendor Id = 1C58

 Device Id = 0023
 NVM Subsystem UID = 1C58CJH0020002F8HUSMR7616BHP301

[000CCA0061450001]

 Device Type = NVMe Namespace

 Device Path = /dev/nvme0n1

 UID = 000CCA0061450001

 Alias = @nvmens0

 Parent Product Name = Ultrastar SN260
 Parent Device Type = NVMe Controller

 Parent Device Path = /dev/nvme0

 Parent UID = 1C58CJH0020002F8HUSMR7616BHP3010023
 NVM Subsystem UID = 1C58CJH0020002F8HUSMR7616BHP301

 Namespace ID = 1

[5000CCA08A000788]

 Product Name = Ultrastar SS300
 Device Type = SCSI Device

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Vendor Name = HGST

 Model Name = HUSMR3280ASS200

Results for scan: Operation succeeded on 3 of 3 devices.

Figure 1: Listing the Installed Devices

## Output Types

The --output-format FORMAT or -o option can be specified with any DM-CLI command for flexibility of output after successful command execution. The user substitutes mini (for MINI output), text (for ASCII text output), or json(for JSON output) for the FORMAT value. If no output format is specified, DM will default to MINI output.

### MINI Output

The MINI output is an abridged, simplified format of the command output. The use of mini is optional; the format is output by default if the user does not specify the text or json formats. For example:

*dm-cli get-state --output-format mini --path /dev/nvme0*

*dm-cli get-state –o mini --path /dev/nvme0*

**OR**

*dm-cli get-state --path /dev/nvme0*

The output will be in the mini output format:

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Device Status = Ready
 Thermal Throttling Status = Disabled
 Beacon LED Enabled = false

 Life Gauge = 100
 System Area Percentage Used = 0

 Power Consumption = 6.965000

Results for get-state: Operation succeeded.

Figure 2: MINI Output Example

### Text Output

The user can specify the text option to specify that the output appear on the computer screen as shown in the following figure. The output is presented in a tabular, human-readable format.

*dm-cli get-state --output-format text --path /dev/nvme0*

===============================================================================

Results for get-state

===============================================================================

+-----------------------------------------------------------------------------+

| Product Name | Ultrastar SN260 |

+-----------------------------------------------------------------------------+

| Device Type | NVMe Controller |

+-----------------------------------------------------------------------------+
| Device Path | /dev/nvme0 |

+-----------------------------------------------------------------------------+

| UID | 1C58CJH0020002F8HUSMR7616BHP3010023 |

+-----------------------------------------------------------------------------+

| Alias | @nvme0 |

+-----------------------------------------------------------------------------+

| Device Status | Ready |
+-----------------------------------------------------------------------------+
| Thermal Throttling Status | Disabled |

+-----------------------------------------------------------------------------+
| Beacon LED Enabled | false |
+-----------------------------------------------------------------------------+

| Life Gauge | 100 |

+-----------------------------------------------------------------------------+
| System Area Percentage Used | 0 |
+-----------------------------------------------------------------------------+

| Power Consumption | 6.965000 |

+-----------------------------------------------------------------------------+

Result: Operation succeeded.

===============================================================================

Figure 3: Text Output Example

### JSON Output

JSON is an acronym for JavaScript Object Notation and is an open standard format that uses human-readable text to transmit data objects consisting of attribute-value pairs. The format is often employed for a scripting environment. To specify JSON output, use the --output-format *json* option.

*dm-cli get-state --output-format json --path /dev/nvme0*

{

 "status": 0,

 "results":[

 {

 "ref": {"path":"/dev/nvme0"},

 "product\_name": "Ultrastar SN260",
 "device\_type": 2030,

 "device\_path": "/dev/nvme0",

 "uid": "1C58CJH0020002HUSMR7616BHP3010023",

 "alias": "@nvme0",

 "device\_status": 3000,
 "thermal\_throttling\_status": 1044,

 "beacon\_led\_enabled": false,

 "life\_gauge": 100,
 "system\_area\_percentage\_used": 0,

 "power\_consumption": 6.965000,

 "status": 0

 }

 ]

}

Figure 4: JSON Output Example

## Commands

**Table 9: Commands** lists the valid commands for DM-CLI 1.x.x that must be specified prior to an input or value parameter.

|  |  |
| --- | --- |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *While* DM-CLI *commands and options are not case-sensitive, the user should be aware that parameter values, such as device paths, UIDs, aliases, etc. are case sensitive.* |

Table 9: Commands

| **Command** | **Description** |
| --- | --- |
| alias | Sets or clears a user supplied name for a device. |
| capture-diagnostics | Captures diagnostic data from a physical device. |
| configure-smart | Configures SMART thresholds or clears warnings on physical devices. |
| Configure-trace | Displays and configures the trace settings. |
| config | Gets and sets application options. |
| Configure-security | Controls the security features on the device. |
| format | Performs a low-level format on devices. |
| get-capabilities | Lists commands supported by devices. |
| get-feature | Retrieves feature data from devices. |
| get-info | Retrieves properties from devices. |
| get-inquiry-page | Retrieves inquiry pages from devices. |
| get-log-page | Retrieves specific log pages from devices. |
| get-mode-page | Retrieves mode pages from devices. |
| get-smart | Retrieves SMART statistics and thresholds from devices. |
| get-state | Retrieves state information from devices. |
| get-statistics | Retrieves statistics from devices. |
| help | Prints command help information. |
| locate | Enables (default), disables, or gets the status of the beacon LED for physical devices. |
| manage-firmware | Displays and updates firmware on physical devices. |
| manage-namespaces | Displays and manages namespaces on a capable physical device. |
| manage-power | Displays and controls power states of a physical device. |
| manage-uefi | Displays and updates the UEFI driver on physical devices. |
| prepare-for-removal | Prepares physical devices for safe removal from the system. |
| reset-to-defaults | Resets physical devices to factory default configuration. |
| resize | Changes the user capacity of physical devices. |
| sanitize | Performs a sanitize operation to erase all user data on physical devices. |
| scan | Lists the storage devices attached to this host. |
| secure-erase | Securely erases all user data from physical devices. |
| secure-purge | Performs a secure purge on physical devices. |
| self-test | Executes device self tests. |
| version | Displays DM-CLI build and version information. |

## Command Support by Device Type

**Table 10: Command Support by Device Type** lists the DM-CLI 1.x.x commands that are supported for Ultrastar NVMe SSDs and Ultrastar SAS SSDs.

Table 10: Command Support by Device Type

|  |  |
| --- | --- |
|  | **Device Type** |
| **Command** | **Ultrastar NVMe SSDs** | **Ultrastar SAS SSDs** | **Ultrastar SATA SSDs** |
| alias | Yes | Yes | Yes |
| capture-diagnostics | Yes | Yes | Yes |
| configure-smart | Yes | Yes | No |
| configure-trace | Yes | Yes | Yes |
| config | Yes | Yes | Yes |
| Configure-security | No | No | Yes |
| format | Yes | Yes | N/A |
| get-capabilities | Yes | Yes | Yes |
| get-feature | Yes | No | N/A |
| get-info | Yes | Yes | Yes |
| get-inquiry-page | No | Yes | N/A |
| get-log-page | Yes | Yes | Yes |
| get-mode-page | No | Yes | N/A |
| get-smart | Yes | Yes | Yes |
| get-state | Yes | Yes | Yes |
| get-statistics | Yes | Yes | No |
| help | Yes | Yes | Yes |
| locate | Yes | N/A | N/A |
| manage-firmware | Yes | Yes | Yes |
| manage-namespaces | Yes | No | N/A |
| manage-power | Yes | Yes | No |
| manage-uefi | Yes | N/A | N/A |
| prepare-for-removal | Yes | Yes | Yes |
| reset-to-defaults | Yes | Yes | No |
| resize | Yes | Yes | No |
| sanitize | No | Yes | Yes |
| scan | Yes | Yes | Yes |
| secure-erase | Yes | No | Yes |
| secure-purge | Yes | No | N/A |
| self-test | Yes | Yes | No |
| version | Yes | Yes | Yes |

## Help System

### Complete Command Listing

The help command provides assistance for all supported DM-CLI commands. If help is used without any arguments, it will list the available commands as shown below.

|  |  |
| --- | --- |
| usage: dm-cli <command> | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | p, --path PATH | -a, --alias ALIAS} |
|  | <command args> |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is "mini". |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
|  |  |
| COMMANDS: |  |
| Alias | Sets or clears a user supplied name for a device. |
| capture-diagnostics | Captures diagnostic data from a physical device. |
| configure-smart | Configures SMART thresholds and clears warnings on physical devices. |
| Configure-trace | Displays and configures the trace settings. |
| Configconfigure-security  | Gets and sets application options’Controls the security features on the device |
| Format | Performs a low-level format on devices. |
| get-capabilities | Lists commands supported by devices. |
| get-feature | Retrieves feature data from devices. |
| get-info | Retrieves properties from devices. |
| get-inquiry-page | Retrieves inquiry pages from devices. |
| get-log-page | Retrieves log pages from devices. |
| get-mode-page | Retrieves mode pages from devices. |
| get-smart | Retrieves SMART statistics and thresholds from devices. |
| get-state | Retrieves state information from devices. |
| get-statistics | Retrieves statistics from devices. |
| Help | Prints command help information. |
| Locate | Enables (default), disables, or gets the status of the beacon LED for physical devices. |
| manage-firmware | Displays and updates firmware on physical devices. |
| manage-namespaces | Displays and manages namespaces on a capable physical device. |
| manage-power | Displays and controls power states of a physical device. |
| manage-uefi | Updates the UEFI driver on physical devices. |
| prepare-for-removal | Prepares physical devices for safe removal from the system. |
| reset-to-defaults | Resets physical devices to factory default configuration. |
| Resize | Changes the user capacity of physical devices. |
| sanitize | Performs a sanitize operation to erase all user data on physical devices. |
| Scan | Lists the storage devices attached to this host. |
| secure-erase | Securely erases all user data from physical devices. |
| secure-purge | Performs a secure purge on physical devices. |
| self-test | Executes device self tests. |
| version | Displays DM-CLI build and version information. |
|  |  |
| Run 'dm-cli help <command>' for more information about a DM-CLI command. |
| For more information about DM-CLI, refer to the DM-CLI User Guide and Release Notes documents. |

### Specific Command Help

If the <command> follows the help command, e.g., dm-cli help *scan*, it will list only the options that are relevant to the scan command:

|  |  |
| --- | --- |
| dm-cli help scan |  |
| usage: dm-cli scan | [-o, --output-format FORMAT] [-c, --config PATH] |
|  |  |
| Lists the storage devices attached to this host. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini” and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |

## Command Exit Status Codes

DM-CLI may return one or more exit status codes to indicate the outcome of an executed command. **Table 11: Command Exit Status Codes** lists the possible status results that may occur.

Table 11: Command Exit Status Codes

| **Exit Status** | **Description** |
| --- | --- |
| 0 | Success |
| 1 | Invalid user supplied parameter or value. |
| 2 | Device error. |
| 3 | I/O error. |
| 4 | Permissions error. |
| 5 | System error. |
| 6 | Qualified success. |
| 7 | Internal error. |

## alias

The alias command allows a user to assign or remove a user-readable name, or a name supplied by the user to a device, as a substitute for the system assigned name. The [device-reference](#Device_Reference) must refer to a single physical device. The user can then specify the use of the alias in all subsequent DM-CLI commands that require a [device-reference](#Device_Reference).

|  |  |
| --- | --- |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *Device aliases are assigned by default to all devices the very first time the* DM-CLI *scan command is run.* |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli alias | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--name NAME] [--clear-alias] |
|  |  |
| Sets or clears a user supplied name for a device. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", "mini", and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --name NAME | The name to be used for this operation. |
| --clear-alias | Clears the alias for the specified device. |

**Examples**

**To assign an alias to a device:**

dm-cli alias --name *alias-name* --path /dev/nvme0

**OR**

dm-cli alias --name *nvme32Tn1* --path /dev/nvme0

**To remove an alias from a device:**

dm-cli --clear-alias --path/dev/nvme0

**OR**

dm-cli --clear-alias --path/dev/nvme0

## capture-diagnostics

The capture-diagnostics command will capture all diagnostic data for a device and compile it to a specific container file that the user can then send to technical support for analysis. The contents of the captured data vary by drive type. The [device-reference](#Device_Reference) must refer to a single physical device (logical devices like NVMe namespaces are not supported).

**Synopsis**

|  |  |
| --- | --- |
| usage: dm capture-diagnostics | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} {-f, --file FILE | --name NAME}[-d,--data-area] [--clear-diag-data][--telemetry] |
|  |  |
| Captures diagnostic data from a physical device. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| -f, --file FILE-d,--data-area | File name or path.The data-area to be captured |
| --name NAME | The name to be used for this operation. |
| --clear-diag-data--telemetry | Clears the diagnostic data.Get telemetry log page data. |

**Options**

|  |  |
| --- | --- |
| **Option** | **Description** |
| -f, --file FILE | This option will specify the file name of the compressed archive that contains all the captured data files. The \*.zip filename extension is appended to the file name. The option is only valid if the user does not specify the –-name option. |
| --name NAME | This option will specify the base name of the compressed archive containing all the diagnostic data files. The name can begin with a directory name to output the archive into an alternate directory. This option is only valid if the user does not use the–f, --file option. The drive serial number, model number, current date, current time, and \*.zip extension are appended to the base name with underscore separators to create the compressed archive name: |
|  | basename\_<serial\_number>\_<model\_number>\_<date>\_<time>.zip |
| --clear-diag-data | This option will trigger the clearing of diagnostic data from the device. This option must be used in conjunction with either the –f, --file or --name options. Diagnostic data will not be cleared unless this option is specified and gathering the diagnostic data is successful.**Note**: The –-clear-diag-data option is supported by Ultrastar SN100 series, Ultrastar SN200 series and Snowbird controller series SSDs. |
| --telemetry | This option is to Get telemetry log page data. This option is supported only for Snowbird product.  |
| -d,--data-area= DATA\_AREA | This option will specify data area to retrieve up to 1-4.This option is supported only for Ultrastar DC SN340 series SSDs. |

**Examples**

**To capture diagnostic data from a device without clearing diagnostic data:**

dm-cli capture-diagnostics –-file nvme0diags --path /dev/nvme0

**OR**

dm-cli capture-diagnostics –-name nvme0diags --path /dev/nvme0

**To capture diagnostic data from a device and clear diagnostic data:**

dm-cli capture-diagnostics –-file nvme0diags --path /dev/nvme0 –-clear-diag-data

**OR**

dm-cli capture-diagnostics –-name nvme0diags --path /dev/nvme0 --clear-diag-data

**To capture diagnostic data from a device with the data area option:**

dm-cli capture-diagnostics –-file nvme0diags --path /dev/nvme0 –d <DATA\_AREA>

**OR**

dm-cli capture-diagnostics –-name nvme0diags --path /dev/nvme0 –-data-area <DATA\_AREA>

## configure-smart

The configure-smart command will allow SMART thresholds to be set, cleared, or restored to default values. The --set, --clear and --restore options may be specified only once on a single command line and combinations of --set, --clear, --restore, –clear-all and --restore-all options are not allowed in the same command invocation.

|  |  |
| --- | --- |
|  | ***Ultrastar NVMe PCIe Devices Only****: Users should be aware that if the* availablespare *threshold is exceeded, the device will enter Read-Only Mode. Users should be careful not to specify too high a value for the available spare threshold, or that the value be greater than the currently available spare value.* |
|  | ***Ultrastar NVMe PCIe Devices Only****: Calling the* DM-CLI *get-smart or get-log-page commands will also cause all warning conditions to be cleared. This behavior is defined by the NVMe specification.* |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli configure-smart | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} [--set NAME --value VALUE] [--clear-all] |
|  | [--clear NAME] [--restore NAME] [--restore-all] |
|  |  |
| Configures SMART thresholds and clears warnings on physical devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are “text”, “mini”, and “json”. The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --set NAME –-value=VALUE | Sets the value of a specific SMART threshold. |
| --clear-all | Clears all threshold warnings. |
| --clear NAME | Clears the specified threshold warning. |
| --restore NAME | Restores the specified threshold to its default value. |
| --restore-all | Restores all thresholds to default values. |

**Options**

|  |  |
| --- | --- |
| **Options** | **Usage** |
| **--set NAME –-value=VALUE** | The set option is used to set the temperature and availablespare SMART thresholds. |
| temperature=(Celsius) | The temperature value is used to set the SMART temperature threshold. The threshold is expressed in degrees Celsius. For example, to set the temperature threshold at 60°C, the expression would be --set *temperature –value 60* |
| availablespare=(percentage) | The availablespare value is used to either set or clear the available spare threshold. The threshold is expressed as a percentage, e.g., to set the threshold at 10%, --set availablespare=10.This threshold is supported for Ultrastar SN200,SN260,SN100 and SN150 controller series SSDs. |
| **--clear-all** | The --clear-all option will clear both the temperature and availablespare SMART threshold warnings. This option is not valid for Ultrastar SAS SSDs |
| **--clear NAME** | Clears the threshold exceeded warning for the SMART threshold specified by name.  |
|  | **Note**: This option is not valid for Ultrastar SAS SSDs or NVMe device; To clear SMART thresholds for NVMe devices, the --clear-all option must be used. |
| **--restore NAME** | The --restore option will restore either the temperature or availablespare thresholds to the default values. |
| **--restore-all** | The --restore-all option will restore both the temperature and availablespare thresholds to the default values. |

**Examples**

**To set the SMART temperature threshold:**

dm-cli configure-smart --set *temperature* --value=*60 --*path /dev/nvme0

**To set the SMART availablespare threshold:**

dm-cli configure-smart --set *availablespare --*value=*20* --path /dev/nvme0

**To clear both the threshold temperature and availablespare warnings:**

dm-cli configure-smart --clear-all --path /dev/nvme0

**To restore the SMART temperature threshold to its default value:**

dm-cli configure-smart --restore *temperature* --path /dev/nvme0

**To restore the SMART availablespare threshold to its default value:**

dm-cli configure-smart --restore *availablespare* --path /dev/nvme0

**To restore all the SMART thresholds to default values:**

dm-cli configure-smart --restore-all --path /dev/nvme0

**Note**: *The following is an example of an invalid* configure-smart *command, with the --set and* --clear *options being invoked within the same command line:*

dm-cli configure-smart --set *temperature=60* --clear *availablespare
--*path /dev/sda

## configure-trace

The configure-trace command allows the user to perform interrelated tasks relating to the DM-CLI trace file. The messages in the trace file are generated by DM-CLI and record a variety of error conditions, including the error return codes from the OS, status codes from the device, and internal DM-CLI errors.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli configure-trace | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | [--file FILE] [--level LEVEL] [--list] [--erase] |
|  |  |
| Displays and configures the trace settings. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| --file=FILE | Trace file name or path. |
| --level=LEVEL | Trace level to be used for tracing.

|  |
| --- |
| none - do not trace any messages |
| error - includes only error-class messages |
| warn - includes error-class and warning-class messages |
| debug - includes all trace messages |

 |
| --list | Display information from the operation. |
| --erase | Erases the contents of the trace file. |
|  |  |

**Options**

|  |  |  |
| --- | --- | --- |
| **Option** | **Value** | **Description** |
| --list | None  | The --list switch will perform the default action and display information about the trace level and trace file location.  |
| --file=FILE | trace file path and name  | The FILE value specifies the path and filename for the trace data. The file will be placed in the $HOME/.dmi directory if the path is not specified.  |
| --level=LEVEL | none, error, warn, debug  | The LEVEL value specifies the trace level to be used for message tracing: none (no tracing), error (error-class), warn (error class/warning class) or debug (trace all messages).  |
| --erase | None  | The --erase switch will erase the contents of the trace file.  |

**Examples**

**To show the current trace file location and level:**

dm-cli configure-trace --list

**To change the trace file name:**

dm-cli configure-trace --file newtrace

**To change the trace level to error:**

dm-cli configure-trace --level error

**Sample Output**

dm-cli configure-trace --list

Level = error

File = /root/.dmi/dmi\_trace.txt

Results for configure-trace: Operation succeeded.

## configure-security

The Configure-security command controls the security feature on the device.

|  |  |
| --- | --- |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *The configure-security command is only supported on SA210 series SSDs.*  |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli configure-security | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--psid-revert] [--psid PSID string] |
|  |  |
| Controls the security feature on the device. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --psid-revert | Performs PSID revert operation on the device. |
| --psid | The PSID string. |
|  |  |

**Options**

|  |  |
| --- | --- |
| **Option** | **Description** |
| --psid-revert | Performs PSID revert operation on the device. |
| --psid | The PSID string |

**Examples**

**To revert the PSID string:**

dm-cli configure-security –psid-revert –psid 69214124631465328747151079375702 –path /dev/nvme0

## config

The config command allows the user to perform interrelated tasks relating to the DM-CLI trace file. The messages in the trace file are generated by DM-CLI and record a variety of error conditions, including the error return codes from the OS, status codes from the device, and internal DM-CLI errors.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli config | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | [--clear KEY] [--reset] [SECTION.OPTION] |
|  |  |
| Displays and configures the trace settings. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| SECTION.OPTION | SECTION is the desired DM-CLI config file and OPTION is the config field for that file to be viewed or modified. |
| --clear KEY | Clears the KEY value. |
| --reset | Reset all config values to default |
|  |  |

**Options**

|  |  |  |
| --- | --- | --- |
| **Option** | **Value** | **Description** |
| SECTION.OPTION | Either scan\_cache or trace for SECTIONOPTION may be file, level, or sys\_log\_enabled if SECTION is trace or file if SECTION is scan\_cache | Valid inputs for SECTION are either scan\_cache or trace. file OPTION accepts a file path where the specified file may be stored. level OPTION may be none, error, warn, or debug syslog\_enabled OPTION is either true to enable logging or false to disable logging |
| --reset | NONE | Reset all config values to default |
| --clear KEY | Same values as SECTION.OPTION | --clear is used to clear the value of an OPTION in a SECTION |

**Examples**

**To show the current trace file location:**

dm-cli config trace.file

**To change the trace file location:**

dm-cli config trace.file new/file/location

**To change the trace level to error:**

dm-cli config trace.level error

**To show the current cache file location:**

 dm-cli config scan\_cache.file

**Sample Output**

dm-cli config

[trace]

 File = “/root/.dmi/dmi\_trace.txt”

 Level = “error”

 Syslog\_enabled = true

[scan\_cache]

 File = ““/root/.dmi/scan\_cache.txt”

Results for config: Operation succeeded.

## format

The format command will perform a low-level format on the targeted device.

|  |  |
| --- | --- |
|  | ***The command is destructive. The user should backup all data currently stored on the device. All user data will be destroyed.*** |
|  | ***After execution of the*** dm-cli format ***command against an Ultrastar SN200 controller in a dual port cabling configuration, the NVMe controller and namespaces may not be visible to*** DM-CLI ***or the host operating system until after a power cycle of the host system unless the host system is capable of hot plug. This behavior is a side effect of firmware compliance with the NVMe and PCIe specifications.*** |
|  | *The combination of* format *options is dependent upon the device type and Host Bus Adapter.* [See Valid Option Combinations](#ValidOptionCombos). |

**Notes**:

1. The --sector size, --dif-level, and --metadata-size parameters are optional for NVMe devices; however, the user must specify the above parameters when targeting NVMe devices configured with multiple namespaces.
2. If any of the optional parameters are not specified, the current device settings will be used to perform the format operation.
3. If the format command is run against an NVMe controller, the format parameters will be applied to all NVMe namespaces on the device.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli format | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--sector-size SIZE] [--dif-level LEVEL] |
|  | [--metadata-size SIZE] [--protection-interval NUM] |
|  |  |
|  |  |
| Performs a low-level format on devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --sector-size SIZE | Size of each sector in bytes. |
| --dif-level LEVEL | Level of DIF protection. |
| --metadata-size SIZE | Size of metadata in bytes. |
| --protection-interval NUM | Number of protection information intervals for this operation. |

**Options**

|  |
| --- |
| **--sector-size SIZE** |
| The SIZE value specifies the new size of the sector on the device or namespace. |
| **Value** | **Result** |
| 512 | 512-byte sectors. |
| 520 | 520-byte sectors. |
| 528 | 528-byte sectors. |
| 4096 | 4096-byte sectors. |
| 4160 | 4160-byte sectors. |
| 4224 | 4224-byte sectors. |
| **--metadata-size SIZE** |
| The SIZE value specifies the new size for the metadata that includes information about the sector and the protection information. A SIZE of 0 is only valid if no protection level is specified, while a SIZE of 8 is necessary when formatting the device with a valid --dif-level LEVEL (protection level). |
| **Note**: This option is not valid for Ultrastar SAS SSDs. |
| **Value** | **Result** |
| 0 | 0 bytes metadata (only valid if --dif-level is 0). |
| 8 | 8 bytes metadata (only valid if --dif-level is > 0). |
| **--dif-level LEVEL** |
| The LEVEL value specifies the DIF (protection) level. |
| **Value** | **Result** |
| 0 | Type 0 protection (no protection). |
| 1 | Type 1 protection (not valid if --metadata-size is 0). |
| 2 | Type 2 protection (not valid if --metadata-size is 0). |
| 3 | Type 3 protection (not valid if --metadata-size is 0). |
| **--protection-interval NUM** |
| The NUM value specifies the number of protection intervals per sector. |
| **Note**: This option is not valid for Ultrastar NVMe PCIe SSDs. |
| **Value** | **Result** |
| 1 | One (1) whole protection interval per sector. |
| 8 | Eight (8) protection intervals interleaved within each sector. |

**Valid Option Combinations**

The format command only supports specific combinations of options, depending upon the device type. The following table lists the valid option combinations.

|  |  |
| --- | --- |
|  | ***Specifying a sector size other than 512 for Ultrastar SAS SSDs managed by Broadcom MegaRAID RAID controllers is not recommended due to limitations of these RAID controllers.*** |

|  |  |
| --- | --- |
| **Device Type** | **Valid Option Combinations** |
| Ultrastar SAS SSDs | --sector-size | 512, 520, 4096, 4160 |
| --dif-level | 0, 1, 2 |
| --protection-interval | 1 |
| --sector-size | 528, 4224 |
| --dif-level | 0 |
| --protection-interval | 1 |
| --sector-size | 4096, 4160 |
| --dif-level | 2 |
| --protection-interval | 8 |
| Ultrastar NVMe SSDs | --sector-size | 512, 4096 |
| --dif-level | 0, 1, 2, 3 |
| --metadata-size | 0 when --dif-level is 0 |
| 8 when --dif-level is >0 |
| --protection-interval | Not valid. |

|  |  |
| --- | --- |
| Snowbird NVMe SSDs | --sector-size 512,4096--dif-level 0--metadata-size 0--protection-interval Not valid.. |

**Examples**

**Device Format**

**To perform a default format of a device:**

dm-cli format *--*path /dev/nvme0

**To format a device with DIF protection:**

dm-cli format --sector-size 512 --metadata-size 8 --dif-level 3 *--*path /dev/nvme0

**Namespace Format**

**To perform a default format of a namespace:**

dm-cli format *--*path /dev/nvme0n1

**To format a namespace with DIF protection:**

dm-cli format --sector-size 512 --metadata-size 8 --dif-level 3 *--*path /dev/nvme0n1

dm-cli get-capabilities --command *command* --command *command*--command *command* --path /dev/nvme0

## get-capabilities

The get-capabilities command retrieves information about the DM-CLI commands supported for the specified device. The user must specify the [device-reference](#Device_Reference) if retrieving the capabilities for a single device. The --command clause allows the user to determine if a specific DM-CLI command is supported by the device(s). The user can also use multiple instances of the --command clause to determine whether the device supports those specific commands. If the command is a valid DM-CLI command but is not supported by the device, it will not appear in the command output.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli get-capabilities | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  |  |
|  |  |
| Lists commands supported by devices. |  |
|  |  |
| OPTIONS: | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -o, --output-format FORMAT | Path to the DM-CLI configuration file. |
| -c, --config PATH | Device unique identifier. |
| -u, --uid UID | Platform path of the device as shown in the output of dm-cli scan. |
| -p, --path PATH | User supplied name for the device. |
| -a, --alias ALIAS |  |
|  |  |

**Example**

**To retrieve all the supported** DM-CLI **commands for a specific device:**

dm-cli get-capabilities *--*path /dev/nvme0

**To determine whether a specific** DM-CLI **command is supported for a device:**

dm-cli get-capabilities --command *command* --path /dev/nvme0

**To determine whether multiple** DM-CLI **commands are supported for a device:**

**Sample Output**

In the following example, get-capabilities command returned ***all*** the DM-CLI commands supported by the device /dev/nvme0:

dm-cli get-capabilities --path /dev/nvme0

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Command = alias

 Command = capture-diagnostics

 Command = configure-smart

 Command = format

 Command = get-capabilities

 Command = get-feature

 Command = get-info

 Command = get-log-page

 Command = get-smart

 Command = get-state

 Command = get-statistics

 Command = locate

 Command = manage-firmware

 Command = manage-namespaces

 Command = manage-power

 Command = manage-uefi

 Command = prepare-for-removal

 Command = reset-to-defaults

 Command = resize

 Command = secure-erase

 Command = secure-purge

Results for get-capabilities: Operation succeeded.

In the following example, multiple instances of the --command clause were used to determine if the device /dev/nvme0 supported the DM-CLI manage-namespaces ***and*** format commands:

dm-cli get-capabilities --path /dev/nvme0 --command manage-namespaces --command format

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Command = format

 Command = manage-namespaces

Results for get-capabilities: Operation succeeded.

## get-feature

The get-feature command will retrieve a feature as specified by the --feature option. The FEATURE value must either be specified as a decimal or hexadecimal integer.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli get-feature | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--feature FEATURE] |
|  |  |
| Retrieves feature data from devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --feature FEATURE | Identifier of the feature. This value must be an integer (e.g. 1) or a prefixed hexadecimal number (e.g. 0x01). |

**Options**

| **--feature Value** | **Description** |
| --- | --- |
| 1 (0x01) | NVMe Feature 01h, Arbitration. |
| 2 (0x02) | NVMe Feature 02h, Power Management. |
| 3 (0x03) | NVMe Feature 03h, LBA Range Type; only supported for Ultrastar NVMe namespaces. |
| 4 (0x04) | NVMe Feature 04h, Temperature Threshold. |
| 5 (0x05) | NVMe Feature 05h, Error Recovery. Only supported for Ultrastar NVMe namespaces. |
| 6 (0x06) | NVMe Feature 06h, Volatile Write Cache. Not supported by Ultrastar SN200, SN340, SN630, SN640, SN740 and SN840 series devices (controller or namespace). |
| 7 (0x07) | NVMe Feature 07h, Number of Queues. |
| 8 (0x08) | NVMe Feature 08h, Interrupt Coalescing. |
| 9 (0x09) | NVMe Feature 09h, Interrupt Vector Configuration; not supported by Ultrastar SN200, SN260, SN100 and SN150 series SSD’s (controller or namespace). |
| 10 (0x0A) | NVMe Feature 0Ah, Write Atomicity. |
| 11 (0x0B) | NVMe Feature 0Bh, Asynchronous Event Configuration. |
| 12 (0x0C) | NVMe Feature 0Ch, Autonomous Power State Transition; Not supported by Ultrastar SN200, SN340, SN630, SN640, SN740 and SN840 series devices (controller or namespace). |
| 126 (0x7E) | NVMe MI Feature 7Eh, Controller Metadata; not supported for Ultrastar SN100, Ultrastar DC SN340 and CL SN720 series devices (controller or namespace). |
| 127 (0x7F) | NVMe MI Feature 7Fh, Namespace Metadata; supported for Ultrastar SN200, SN630, SN640, SN740 and SN840 series NVMe namespaces. |
| 128 (0x80) | NVMe Feature 80h, Software Progress Marker; Not supported by Ultrastar DC SN340 and CL SN720 series devices (controller or namespace). |
| 129 (0x81) | NVMe Feature 81h, Host Identifier; Not supported by Ultrastar DC SN340 and CL SN720 series devices (controller or namespace). |
| 130 (0x82) | NVMe Feature 82h, Reservation Notification Mask; not supported by Ultrastar NVMe SSD firmware (controller or namespace). |
| 131 (0x83) | NVMe Feature 83h, Reservation Persistence; not supported by Ultrastar NVMe SSD firmware (controller or namespace). |

**Example**

dm-cli get-feature --feature 7 *--*path /dev/nvme0

**Sample Output**

dm-cli get-feature --feature 7 --path /dev/nvme0

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Feature Id = 7

Feature Info =

 00000000 7f00 7f00 [.... ]

Results for get-feature: Operation succeeded.

## get-info

The get-info command will retrieve the static properties of a device, such as the device type, device path, UID, model name, serial number, etc.

|  |  |
| --- | --- |
|  | *The set of properties shown in the* dm-cli get-info *command may vary by device type.* |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli get-info | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  |  |
| Retrieves properties from devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”.  |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |

**Example**

dm-cli get-info --path /dev/nvme0

**NVMe Controller Sample Output**

dm-cli get-info --path /dev/nvme0 --output-format mini

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7617BHP3010023

 Alias = @nvme0

 Vendor Name = HGST

 Model Name = HUSMR7617BHP301

 Serial Number = CJH0020002F8

 Vendor ID = 1C58

 Device ID = 0003

 Firmware Version = KNGND090

 [...]

Results for get-info: Operation succeeded.

**NVMe Namespace Sample Output**

dm-cli get-info --path /dev/nvme0n1 --output-format mini

[/dev/nvme0n1]

 Device Type = NVMe Namespace

 Device Path = /dev/nvme0n1

 UID = 000CCA0061450001

 Alias = @nvmens0

 Parent Product Name = Ultrastar SN260

 Parent Device Path = /dev/nvme0

 [...]
 Results for get-info: Operation succeeded.

**SCSI Device Sample Output (managed by non-RAID HBA)**

dm-cli get-info --path /dev/sda --output-format mini

[/dev/sda]

 Product Name = Ultrastar SS300

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Vendor Name = HGST

 Model Name = HUSMR3280ASS200

 Serial Number = 5HV00HKX

 Firmware Version = BCGNA100

 [...]

Results for get-info: Operation succeeded.

**SCSI Device Sample Output (managed by MegaRAID RAID controller)**

dm-cli get-info --alias @scsi1 --output-format mini

[@scsi2]

 Product Name = Ultrastar SSD800MH-400
 Device Type = SCSI Device
 Device Path = /dev/sda

 UID = 5000CCA02B005870

 Alias = @scsi2

 Vendor Name = HGST

 Model Name = HUSMH8040ASS200

 Serial Number = 2HV05WLA

 Firmware Version = SMGNA274

 Default Capacity = 400088457216

 Capacity = 400088457216

 Parent Device Type = MegaRAID Controller

 RAID Controller ID = 0

 RAID Device ID = 20

 Sector Count = 781422768

 Sector Size = 512

 Metadata Size = 0

 DIF Level = None

 Protection Interval = 1

 Multipath Support = true

 Encryption Support = true
 Encryption Mode = Full Disk

 Hardware Version = PIKE BAY B.0

 SAS Port 1 Width = Narrow (1x)

 SAS Port 1 Physical Link Rate = 12 Gb/s

Results for get-info: Operation succeeded.

## get-inquiry-page

The get-inquiry-page command will retrieve an inquiry page or VPD page as specified by the --page and --vpd options. The PAGE value must either be specified as a decimal or hexadecimal integer.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli get-inquiry-page | [-o, --output-format FORMAT] [-c, --config PATH]{-u, --uid UID | -p, --path PATH | -a, --alias ALIAS}[--page PAGE] [--vpd] |
|  |  |
| Retrieves inquiry pages from devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --page PAGE | Identifier of the page. This value must be either an integer (e.g. 1) or a prefixed hexadecimal number (e.g. 0xC1). |
| --vpd | Get a Vital Product Data page. |

**Options**

|  |  |  |
| --- | --- | --- |
| **--page Value** | **--vpd Option** | **Description** |
| 0 (0x00) | No | SCSI Standard Inquiry Data Inquiry Page |
| 0 (0x00) | Yes | SCSI Supported VPD Pages VPD Page |
| 3 (0x03) | Yes | SCSI ASCII Information VPD Page |
| 128 (0x80) | Yes | SCSI Unit Serial Number VPD Page |
| 131 (0x83) | Yes | SCSI Device Identification VPD Page |
| 132 (0x84) | Yes | SCSI Software Interface Identification VPD Page. Not supported by Ultrastar SAS SSD firmware. |
| 133 (0x85) | Yes | SCSI Management Network Addresses VPD Page. Not supported by Ultrastar SAS SSD firmware. |
| 134 (0x86) | Yes | SCSI Extended INQUIRY Data VPD Page |
| 135 (0x87) | Yes | SCSI Mode Page Policy VPD Page |
| 136 (0x88) | Yes | SCSI Ports VPD Page |
| 137 (0x89) | Yes | SCSI ATA Information VPD Page. Not supported by Ultrastar SAS SSD firmware. |
| 138 (0x8A) | Yes | SCSI Power Condition VPD Page |
| 139 (0x8B) | Yes | SCSI Device Constituents VPD Page. Not supported by Ultrastar SAS SSD firmware. |
| 140 (0x8C) | Yes | SCSI CFA Profile Information VPD Page. Not supported by Ultrastar SAS SSD firmware. |
| 141 (0x8D) | Yes | SCSI Power Consumption VPD Page |
| 143 (0x8F) | Yes | SCSI Third-party Copy VPD Page. Not supported by Ultrastar SAS SSD firmware. |
| 144 (0x90) | Yes | SCSI Protocol Specific Logical Unit Information VPD Page |
| 145 (0x91) | Yes | SCSI Protocol Specific Port Information VPD Page |
| 176 (0xB0) | Yes | SCSI Protocol Block Limits VPD Page |
| 177 (0xB1) | Yes | SCSI Block Device Characteristics VPD Page |
| 178 (0xB2) | Yes | SCSI Logical Block Provisioning VPD Page |
| 195 (0xC3) | Yes | Device Manageability VPD Page |
| 210 (0xD2) | Yes | HGST SCSI Component and Assembly VPD Page. Supported for Ultrastar SAS SSDs only. |

**Example**

dm-cli get-inquiry-page --page 0x03 --vpd *--*path /dev/sda

**OR**

dm-cli get-inquiry-page --page 3 --vpd *--*path /dev/sda

**Sample Output**

dm-cli get-inquiry-page --page 3 --vpd --path /dev/sda

[/dev/sda]

 Product Name = Ultrastar SS300
 Device Type = SCSI Device

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Page ID = 3

 VPD = true

 Page Data =

 00000000 0003 011c 0000 0000 0000 0000 0000 0000 [................]

 00000010 0000 0000 0000 0000 4243 474e 4131 3030 [........BCGNA100]

 00000020 2020 2020 0000 0000 6131 3030 3030 3001 [ ....a100000.]

 00000030 3130 3000 5475 6520 4d61 7920 3136 2030 [100.Tue May 16 0]

 00000040 373a 3330 3a30 3720 3230 3137 0000 0000 [7:30:07 2017....]

 00000050 0101 0f10 4243 4d4c 4300 0000 5341 5300 [....BCMLC...SAS.]

 00000060 3036 4700 542d 4556 414c 0000 7465 7374 [06G.T-EVAL..test]

 00000070 3431 6c00 0000 0000 7373 6466 6f72 6765 [41l.....ssdforge]

 00000080 3031 0000 0000 0000 2f74 656d 702f 6772 [01....../temp/gr]

 00000090 697a 7a6c 792f 6275 696c 642f 7072 6f64 [izzly/build/prod]

 000000A0 7563 742f 6265 6172 0000 0004 0001 0000 [uct/bear........]

 000000B0 0000 0000 0000 0000 0000 0000 5044 5631 [............PDV1]

 000000C0 3030 3734 0000 0000 0000 0000 0000 0201 [0074............]

 000000D0 0000 0000 5045 5246 2020 2020 0400 0000 [....PERF ....]

 000000E0 4243 5f52 3130 302e 3030 2d30 2d67 3334 [BC\_R100.00-0-g34]

 000000F0 6432 6338 6100 0000 0000 0000 0000 0000 [d2c8a...........]

 00000100 3534 3762 3330 3236 6639 6231 2073 6d6f [547b3026f9b1 smo]

 00000110 7561 7820 2020 3230 3137 3034 3230 3135 [uax 2017042015]

Results for get-inquiry-page: Operation succeeded.

## get-log-page

The get-log-page command will retrieve a log page or subpage as specified by the --page and --subpage options. The PAGE and SUBPAGE values must either be specified as decimal or hexadecimal integers.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli get-log-page | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--page PAGE] [--subpage SUBPAGE] |
|  |  |
| Retrieves log pages from devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --page PAGE | Identifier of the page. This value must be either an integer (e.g. 1) or a prefixed hexadecimal number (e.g. 0xC1). |
| --subpage SUBPAGE | Identifier of the subpage. This value must be either an integer (e.g. 1) or a prefixed hexadecimal number (e.g. 0xC1). |

**Options**

|  |  |  |
| --- | --- | --- |
| **--page Value** | **--subpage Value** | **Description** |
| 0 (0x00) | Not Specified | SCSI Devices: SCSI Supported Log Pages Log PageATA Devices: ATA supported Log Directory. |
| 1 (0x01) | Not Specified | SCSI Devices: SCSI Buffer Over-Run/Under-Run Log Page. Not supported by Ultrastar SAS SSD firmware.NVMe Devices: Error Information Log Page. Supported for Ultrastar NVMe controllers only.  |
| 2 (0x02) | Not Specified | SCSI Devices: Write Error Counters Log PageNVMe Devices: SMART / Health Information Log Page. This is a raw dump of Log Page 2 (see the [Sample Output](#getlogpageSampleOutput)); however the same information will appear in a detailed, parsed format when using the [get-smart](#CLI_GetSmart) command. |
| 3 (0x03) | Not Specified | SCSI Devices: Read Error Counters Log PageATA Devices: Extended Comprehensive SMART Error Log Page.NVMe Devices: Firmware Information Log Page. Supported for Ultrastar NVMe controllers only. This is a raw dump of Log Page 3 (see the [Sample Output](#getlogpageSampleOutput)); however the same information will appear in a detailed, parsed format when using the [get-info](#CLI_GetInfo) command. |
| 4 (0x04) | Not Specified | SCSI Devices: Read Reverse Error Counters Log Page. Not supported by Ultrastar SAS SSD device firmware.ATA Devices: Device Statistics Log Page.NVMe Devices: Changed Namespace List Log Page. Supported for Ultrastar SN200,SN260,SN630, SN640, SN740 and SN840 controllers only |
| 5 (0x05) | Not Specified | SCSI Devices: Verify Error Counters Log PageNVMe Devices: Commands Supported and Effects Log Page. Supported for Ultrastar SN200,SN260,SN630, SN640, SN740 and SN840 controllers only |
| 6 (0x06) | Not Specified | SCSI Devices: Non-Medium Error Log PageNVMe Devices: Log Page 06h (Device Self-test Log Page).  Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only |
| 7 (0x07) | Not Specified | SCSI Devices: Last n Error Events Log Page. Not supported by Ultrastar SAS SSD firmware.ATA Devices: Extended SMART Self Test Log Page.NVMe devices - Log Page 07h (Host-Initiated Telemetry Log Page).  Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only. |
| 8 (0x08) | Not Specified | NVMe devices - Log Page 08h (Controller-Initiated Telemetry Log Page).  Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only. |
| 11 (0x0B) | Not Specified | SCSI Devices: Last n Deferred Errors or Asynchronous Events Log Page. Not supported by Ultrastar SAS SSD device firmware. |
| 13 (0x0D) | 0 (0x00) | Ultrastar SAS SSDs: Temperature Information Log Page |
| 13 (0x0D) | 1 (0x01) | SCSI Devices: Environmental Reporting Log PageATA Devices: LPS Mis-alignment Log Page. Not supported by Ultrastar SAS SSD device firmware. |
| 13 (0x0D) | 2 (0x02) | SCSI Devices: Environmental Limits Log Page. Not supported by Ultrastar SAS SSD device firmware. |
| 14 (0x0E) | 0 (0x00) | Ultrastar SAS SSDs: Start-Stop Cycle Counter Log Page |
| 14 (0x0E) | 1 (0x01) | SCSI Devices: Utilization Log Page |
| 15 (0x0F) | Not Specified | SCSI Devices: Application Client Log Page |
| 16 (0x10) | Not Specified | SCSI Devices: Self-Test Results Log PageATA Devices: NCQ Command Error Log Page. |
| 17 (0x11) | Not Specified | SCSI Devices: Solid State Media Log PageATA Devices: SATA PHY Event Counter Log Page. |
| 21 (0x15) | 0 (0x00) | Ultrastar SAS SSDs: Background Media Scan Operations Log Page |
| 21 (0x15) | 1 (0x01) | SCSI Devices: Pending Defects Log Page. Not supported by Ultrastar SAS SSD device firmware. |
| 21 (0x15) | 2 (0x02) | SCSI Devices: Background Operation Log Page. Not supported by Ultrastar SAS SSD device firmware. |
| 23 (0x17) | Not Specified | SCSI Devices: Non-volatile Cache Log Parameters Log Page |
| 24 (0x18) | 0 (0x00)  | SCSI Devices: Protocol-Specific Log Parameters Log Page |
| 24 (0x18) | 1 (0x01) and 254 (0xFE) | Spnumber set to a value between 1 and 254. Not supported by Ultrastar SAS SSD device firmware. |
| 25 (0x19) | 0 (0x00) | SCSI Devices: General Statistics and Performance Log PageATA Devices: LBA Status Log Page. |
| 25 (0x19) | 1 (0x01) through 31 (0x1F) | SCSI Devices: General Statistics and Performance for Group n Log Page. Not supported by Ultrastar SAS SSD device firmware. |
| 26 (0x1A) | Not Specified | SCSI Devices: Power Condition Transitions Log Page |
| 36 (0x24) | Not Specified | ATA Devices: Current Device Internal Status Log Page. |
| 37 (0x25) | Not Specified | ATA Devices: Saved Device Internal Status Log Page. |
| 47 (0x2F) | Not Specified | SCSI Devices: Informational Exceptions Log Page |
| 48 (0x30) | Not Specified | Ultrastar SAS SSDs: Reserved Content Log PageATA Devices: Identify Device Data Log Page. |
| 55 (0x37) | Not Specified | Ultrastar SAS SSDs: Miscellaneous Data Counters Log Page |
| 128..159(0x80..0x9f) | Not Specified | ATA Devices: Host Specific Log Page. |
| 128 (0x80) | Not Specified | NVMe Devices: Reservation Notification Log Page. Not supported by Ultrastar SN100 or SN150. |
| 129 (0x81) | Not Specified | NVMe devices - Log Page 81h (Sanitize Status Log Page).   Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers, and also SN200 and SN260 controllers if running EMC or Facebook customized firmware. |
| 192 (0xC0) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page C0h (End of Life Log Page). Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only.  |
| 193 (0xC1) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page C1h (Statistics and Results Log Page).  Supported for Ultrastar NVMe controllers only. Not Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only. |
| 194 (0xC2) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page C2h (Device Manageability Log Page). Supported for Ultrastar SN200, SN260, SN630, SN640, SN740 and SN840 controllers only. |
| 195 (0xC3) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page C3h (Security Log Page). Supported for Ultrastar SN200 and SN260 controllers only. |
| 196 (0xC4) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page C4h (PCIe HW Registers Log Page). Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only. |
| 197 (0xC5) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page C5h (Power Data Log Page). Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only. |
| 198 (0xC6) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page C6h (Temperature Data Log Page). Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only. |
| 209 (0xD0) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page D0h (Expanding Smart Type Data Log Page.).Supported for Ultrastar SN630 and SN640 controllers only, and only if running AWS customized firmware. |
| 222 (0xDE) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page DEh (EMC Custom Log Page).  Supported for Ultrastar SN200, SN260 and SN840 controllers only, and only if running EMC customized firmware. |
| 224 (0xE0) | Not Specified | ATA Devices: SCT Command/status Log Page. |
| 225 (0xE1) | Not Specified | ATA Devices: SCT Data Transfer Log Page. |
| 240 (0xF0) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page F0h (Apple Custom log Page). Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only. |
| 241 (0xF1) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page F1h (Apple Custom log Page). Supported for Ultrastar SN640 controllers only. |
| 242 (0xF2) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page F2h (Apple Custom log Page). Supported for Ultrastar SN640 controllers only. |
| 250 (0xFA) | Not Specified | Ultrastar NVMe devices - Vendor Unique Log Page FAh (CCDS Data Log Page).Supported for Ultrastar SN630, SN640, SN740 and SN840 controllers only. |

**Example**

dm-cli get-log-page --page 0x02 *--*path /dev/nvme0

**OR**

dm-cli get-log-page --page 2 *--*path /dev/nvme0

**Sample Output**

dm-cli get-log-page --page 2 --path /dev/nvme0

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Page ID = 2

 Page Data =

 00000000 003d 0164 0a00 0000 0000 0000 0000 0000 [.=.d............]

 00000010 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000020 0a00 0000 0000 0000 0000 0000 0000 0000 [................]

 00000030 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000040 d604 0000 0000 0000 0000 0000 0000 0000 [................]

 00000050 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000060 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000070 0100 0000 0000 0000 0000 0000 0000 0000 [................]

 00000080 4408 0000 0000 0000 0000 0000 0000 0000 [D...............]

 00000090 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000000A0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000000B0 0100 0000 0000 0000 0000 0000 0000 0000 [................]

 000000C0 0000 0000 0000 0000 3d01 3701 3b01 3e01 [........=.7.;.>.]

 000000D0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000000E0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000000F0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000100 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000110 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000120 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000130 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000140 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000150 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000160 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000170 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000180 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 00000190 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000001A0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000001B0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000001C0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000001D0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000001E0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

 000001F0 0000 0000 0000 0000 0000 0000 0000 0000 [................]

Results for get-log-page: Operation succeeded.

## get-mode-page

The get-mode-page command will retrieve a mode page or subpage as specified by the --page and --subpage options. The PAGE and SUBPAGE values must either be specified as decimal or hexadecimal integers.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli get-mode-page | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | --page PAGE [--subpage SUBPAGE] |
|  |  |
| Retrieves mode pages from devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --page PAGE | Identifier of the page. This value must be either an integer (e.g. 1) or a prefixed hexadecimal number (e.g. 0xC1). |
| --subpage SUBPAGE | Identifier of the subpage. This value must be either an integer (e.g. 1) or a prefixed hexadecimal number (e.g. 0xC1). |

**Options**

|  |  |  |
| --- | --- | --- |
| **--page Value** | **--subpage Value** | **Description** |
| 0 (0x00) | Not Specified | Ultrastar SAS SSDs: Vendor Unique Parameters Mode Page |
| 1 (0x01) | Not Specified | SCSI Devices: Read/Write Error Recovery Parameters Mode Page  |
| 2 (0x02) | Not Specified | SCSI Devices: Disconnect/Reconnect Parameters Mode Page |
| 3 (0x03) | Not Specified | SCSI Devices: Format Device Parameters Mode Page |
| 4 (0x04) | Not Specified | SCSI Devices: Rigid Disk Drive Geometry Parameters Mode Page |
| 7 (0x07) | Not Specified | SCSI Devices: Verify Error Recover Parameters Mode Page |
| 8 (0x08) | Not Specified | SCSI Devices: Caching Parameters Mode Page |
| 10 (0x0A) | Not Specified | SCSI Devices: Control Mode Parameters Page |
| 10 (0x0A) | 1 (0x01) | SCSI Devices: Control Extension Mode Subpage |
| 10 (0x0A) | 2 (0x02) | SCSI Devices: Application Tag Mode Subpage |
| 12 (0x0C) | Not Specified | SCSI Devices: Notch Parameters Mode Page |
| 21 (0x15) | Not Specified | SCSI Devices: Extended Mode Page. Not supported by Ultrastar SAS SSD firmware. |
| 22 (0x16) | Not Specified | SCSI Devices: Extended Device-Type Specific Mode Page. Not supported by Ultrastar SAS SSD firmware. |
| 24 (0x18) | Not Specified | SCSI Devices: Protocol Specific Logical Unit Mode Page |
| 25 (0x19) | Not Specified | SCSI Devices: Port Control Parameters Mode Page |
| 25 (0x19) | 1 (0x01) | SCSI Devices: PHY Control and Discover Mode Subpage |
| 25 (0x19) | 2 (0x02) | SCSI Devices: Shared Port Control Mode Subpage |
| 25 (0x19) | 3 (0x03) | SCSI Devices: Enhanced PHY Control Mode Subpage |
| 26 (0x1A) | Not Specified | SCSI Devices: Power Control Mode Page |
| 26 (0x1A) | 1 (0x01) | SCSI Devices: Power Consumption Mode Subpage |
| 28 (0x1C) | Not Specified | SCSI Devices: Informational Exceptions Control Mode Page |
| 28 (0x1C) | 1 (0x01) | SCSI Devices: Background Control Mode Subpage |

**Example**

dm-cli get-mode-page --page 0x03 *--*path /dev/sda

**OR**

dm-cli get-mode-page --page 3 *--*path /dev/sda

**Sample Output**

dm-cli get-mode-page --page 3 --path /dev/sda

[/dev/sda]

 Product Name = Ultrastar SS300
 Device Type = SCSI Device

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Page ID = 3

 Subpage ID = 0

 Page Data =

 00000000 0316 0000 0000 0000 0000 0000 0200 0000 [................]

 00000010 0000 0000 4000 0000 [....@... ]

Results for get-mode-page: Operation succeeded.

## get-smart

The get-smart command will retrieve the S.M.A.R.T. statistics and threshold values from a target device. As shown in the [Sample Output](#getsmartsampleoutput), the command will return error rates, read/write rates, critical temperature data, and the current properties of the NAND media.

|  |  |
| --- | --- |
|  | *The set of properties shown in the* dm-cli get-smart *command may vary by device type.* |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli get-smart | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  |  |
| Retrieves SMART statistics and thresholds from devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |

**Example**

dm-cli get-smart *--*path /dev/nvme0

**NVMe Controller Sample Output**

dm-cli get-smart --path /dev/nvme0 --output-format mini

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Data Units Read = 260567436

 Data Units Written = 314947558

 Host Read Commands = 18553931035

 Host Write Commands = 17450482756

 Available Spare = 100

 Available Spare Threshold = 10

 Available Spare Critical Warning = false

 Percentage Used = 0

 Temperature = 40

 Temperature Threshold = 90

 Temperature Critical Warning = false

 Device Reliability Critical Warning = false

 Media Read Only Mode Critical Warning = false

 Volatile Memory Backup Device Failure Critical Warning = false

 Controller Busy Time = 7513

 Power Cycles = 45

 Power On Hours = 3749

 Unsafe Shutdowns = 19

 Media And Data Integrity Errors = 0

 Error Information Log Entries = 1

 SMART Status = Normal

Results for get-smart: Operation succeeded.

**NVMe Namespace Sample Output**

dm-cli get-smart --path /dev/nvme0n1 --output-format mini

[/dev/nvme0n1]

 Device Type = NVMe Namespace

 Device Path = /dev/nvme0n1

 UID = 000CCA0061450001

 Alias = @nvmens0

 Data Units Read = 260567436

 Data Units Written = 314947558

 Host Read Commands = 18553931036

 Host Write Commands = 17450482757

 Available Spare = 100

 Available Spare Threshold = 10

 Available Spare Critical Warning = false

 Percentage Used = 0

 Temperature = 40

 Temperature Critical Warning = false

 Device Reliability Critical Warning = false

 Media Read Only Mode Critical Warning = false

 Volatile Memory Backup Device Failure Critical Warning = false

 Controller Busy Time = 7513

 Power Cycles = 45

 Power On Hours = 3749

 Unsafe Shutdowns = 19

 Media And Data Integrity Errors = 0

 Error Information Log Entries = 1

 SMART Status = Normal

Results for get-smart: Operation succeeded.

**SCSI Device Sample Output**

dm-cli get-smart --path /dev/sda --output-format mini

[/dev/sda]

 Product Name = Ultrastar SS300
 Device Type = SCSI Device

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Data Units Read = 991819

 Data Units Written = 0

 Host Read Commands = 44589

 Host Write Commands = 256

 Percentage Used = 0

 Temperature = 34

 Temperature Threshold = 70
 Power On Hours = 21783

 SMART Status = Normal

 SMART Attributes Table =

 Name Type Percentage Tripped

 Temperature NA 48 false

 Remaining Reserve 1 Pre-fail 3 false

 Remaining Reserve XOR Pre-fail 2 false

 XOR Depletion Pre-fail 0 false

 Volatile Memory Backup Failure Pre-fail 0 false

 Wear Indicator Advisory 0 false

 System Area Wear Indicator Pre-fail 1 false

 Channel Hangs Pre-fail 0 false

 Flash Scan Failure Pre-fail 0 false

Results for get-smart: Operation succeeded.

## get-state

The get-state command will retrieve the current state information of the target device, including the current encryption mode and remaining life.

|  |  |
| --- | --- |
|  | *The set of properties shown in the* dm-cli get-state *command may vary by device type.* |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli get-state | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  |  |
| Retrieves state information from devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”.  |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |

**Example**

dm-cli get-state *--*path /dev/nvme0

**NVMe Controller Sample Output**

dm-cli get-state --path /dev/nvme0 --output-format mini

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Device Status = Ready
 Thermal Throttling Status = Disabled
 Beacon LED Enabled = false

 Life Gauge = 100
 System Area Percentage Used = 0

 Power Consumption = 6.965000

Results for get-state: Operation succeeded.

**NVMe Namespace Sample Output**

dm-cli get-state --path /dev/nvme0n1 --output-format mini

[/dev/nvme0n1]

 Device Type = NVMe Namespace

 Device Path = /dev/nvme0n1

 UID = 000CCA0061450001

 Alias = @nvmens0

 Device Status = Ready

 Life Gauge = 100

Results for get-state: Operation succeeded.

**SCSI Device Sample Output**

dm-cli get-state --path /dev/sda --output-format mini

[/dev/sda]

 Product Name = Ultrastar SS300
 Device Type = SCSI Device

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Device Status = Ready

 Life Gauge = 100

 Power Consumption = 14.000000

Results for get-state: Operation succeeded.

**Device Status Values**

The values that are shown in the Device Status property and the corresponding enumerations, which are shown if using the JSON output format, are explained in the table below:

|  |  |
| --- | --- |
| **Device Status** | **Enumeration** |
| Ready | 3000 |
| Secure Purge in Progress | 7002 |
| Secure Purge Failed: Power Cycle Required | 7003 |
| Secure Purge Interrupted: Retry Required | 7004 |
| Sanitize in Progress | 8002 |
| Sanitize Failed: Retry Required | 8003 |
| Format in Progress | 19002 |
| Format Unsuccessful: Retry Required | 19003 |

## get-statistics

The get-statistics command retrieves statistical data for the specified --category from the target device. The --interval option is valid for Ultrastar NVMe controllers with the performance category and if specified, will return performance statistics from the specified reporting interval. The command is only supported for physical devices.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli get-statistics | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [-i, --interval INTERVAL] [--category CATEGORY] |
|  |  |
| Retrieves statistics from devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| -i, --interval INTERVAL | Interval to be used for this operation. |
| --category CATEGORY | Category to be used for this operation. |

**Options**

|  |  |  |
| --- | --- | --- |
| **Option** | **Value** | **Description** |
| -i, --interval INTERVAL | 1 | Most recent five (5) minute accumulated set. |
|  | 2 – 12 | Previous five (5) minute accumulated sets. |
| This option is only valid when used in conjunction with the performance category, and is not valid for Ultrastar SAS SSDs and Snowbird products. | 13 | The accumulated total of sets 1 through 12 that contain the previous hour of accumulated statistics. |
| 14 | The statistical set accumulated since power-up. |
| 15 | The statistical set accumulated during the entire lifetime of the device. |
| --category CATEGORY | performance | Performance statistics; the properties and values collected by this category will pertain to performance metrics. If the --interval option is not specified, a default interval of 15 will be used. |
|  | power | Power statistics; the properties and values collected by this category will contain power consumption statistics. The power consumption value is in mW.This category is not supported for Ultrastar SAS SSDs and Snowbird controller series SSDs. |
|  | queues | Queue statistics; the properties and values collected by this category are applicable to queues that are used by the device driver or firmware.This category is not supported for Ultrastar SAS SSDs. |
|  | commands | Command statistics; the properties and values collected by this category will contain read, write, verify and erase command execution statistics.This category is not supported for Snowbird controller series SSDs. |
|  | temperature | Temperature statistics; the properties and values collected by this category will contain the recorded maximum, minimum, reference and sensor (main, inlet, daughter board) temperature data. |
|  | miscellaneous | Miscellaneous statistics; the properties and values collected by this category are not specific to any of the previous categories.This category is not supported for Snowbird controller series SSDs. |

**Example**

dm-cli get-statistics --interval 14 --category performance *--*path /dev/nvme0

**NVMe Controller Sample Output --category performance**

dm-cli get-statistics --category performance --path /dev/nvme0

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Category = Performance

 Interval = 14

 Host Read Commands = 93613753

 Host Read Blocks = 3027373912

 Average Read Size = 32.338987

 [...]

Results for get-statistics: Operation succeeded.

**SCSI Device Sample Output --category performance**

dm-cli get-statistics --category performance --path /dev/sda

[/dev/sda]

 Product Name = Ultrastar SS300
 Device Type = SCSI Device

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Category = Performance

 Interval = 14

 Host Read Commands = 259043

 Host Read Blocks = 2086981

 Average Read Size = 8.056504

 [...]

Results for get-statistics: Operation succeeded.

**NVMe Controller Sample Output --category power**

dm-cli get-statistics --category power --path /dev/nvme0

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Category = Power

 Processor Power Consumption = 6613

 NAND Power Consumption = 1187

Results for get-statistics: Operation succeeded.

**NVMe Controller Sample Output --category queues**

dm-cli get-statistics --category queues --path /dev/nvme0

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Category = Queues

 Number of I/O Completion Queues Allocated = 128

 Number of I/O Submission Queues Allocated = 128

Results for get-statistics: Operation succeeded.

**NVMe Controller Sample Output --category commands**

dm-cli get-statistics --category commands --path /dev/nvme0

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Category = Commands

 Total Re-Writes = 0

 Total Write Bytes Processed = 165052617228288

 Total Uncorrected Write Errors = 0

 [...]

Results for get-statistics: Operation succeeded.

**SCSI Device Sample Output --category commands**

dm-cli get-statistics --category commands --path /dev/sda

[/dev/sda]

 Product Name = Ultrastar SS300
 Device Type = SCSI Device

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Category = Commands

 Write Errors Corrected Without Delays = 0
 Write Errors Corrected With Possible Delays = 0

 [...]

Results for get-statistics: Operation succeeded.

**NVMe Controller Example--category temperature**

dm-cli get-statistics --category temperature --path /dev/nvme0

**SCSI Device Example --category temperature**

dm-cli get-statistics --category temperature --path /dev/sda

**NVMe Controller Example --category miscellaneous**

dm-cli get-statistics --category miscellaneous --path /dev/nvme0

**SCSI Device Sample Output --category miscellaneous**

dm-cli get-statistics --category miscellaneous --path /dev/sda

## locate

The locate command will either activate, deactivate, or show the status of the beacon LED on physical devices that have a beacon LED.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli locate | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--disable] [--enable] [--status] |
|  |  |
| Enables (default), disables, or gets the status of the beacon LED for physical devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --disable | Executes the disable action. |
| --enable | Executes the enable action. |
| --status | Displays status of this operation. |

**Options**

|  |  |
| --- | --- |
| **Option** | **Description** |
| --enable | The --enable option will enable the beacon LED on the target device(s). This is also the default action and will be executed if no other options are specified. |
| --disable | The --disable option will disable the beacon LED on the target device(s). |
| --status | The --status option shows the status of the beacon LED on the target device(s).**Note**: This option is not supported for Ultrastar SN100 or SN150 SSDs. |

**Examples**

**To enable the beacon LED for a device:**

dm-cli locate --enable *--*path /dev/nvme0

**To disable the beacon LED for a device:**

dm-cli locate --disable *--*path /dev/nvme0

**To show the beacon LED status for a device:**

dm-cli locate --status *--*path /dev/nvme0

**Sample Output**

dm-cli locate --path /dev/nvme0

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Beacon LED Enabled = false

Results for locate: Operation succeeded.

## manage-firmware

The manage-firmware command will list the firmware version(s) present on the device; the user can also perform interrelated firmware management tasks. The command is only valid for physical devices.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli manage-firmware | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [-l, --list] [--load] [-f, --file FILE] [--activate] |
|  | [-s, --slot NUMBER] [--reset] |
|  |  |
| Displays and updates firmware on physical devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| -l, --list | Displays information from the operation. |
| --load | Loads a firmware image onto the specified devices. |
| -f, --file FILE | File name or path. |
| --activate | Activates a firmware image. |
| -s, --slot NUMBER | The slot number. |
| --reset | Resets the specified devices. |

|  |  |
| --- | --- |
| **Option** | **Description** |
| --list | The --list option will list the firmware image(s) present on the device as well as the currently running firmware version. This is also the default action and will be executed if no other options are specified. |
| --load | The --load option will download the firmware image specified by the --file option onto the target device(s). |
| -f, --file FILE | The FILE value specifies the path and filename of the firmware image. The --file option is required when specifying the --load option. |
| --activate | The --activate option is used to enable a firmware image on the target device(s). This switch may be used along with the --load option to immediately activate the firmware upon the successful load. If the device is an Ultrastar NVMe device, the firmware image that will be activated is specified by the **–slot** option. **Note**: This option is required with the --load option for Ultrastar SAS and SATA SSDs, and required with the --slot option for Ultrastar NVMe SSDs. |
| --slot NUMBER | The --slot option specifies the slot number to target for devices that support multiple firmware images. This option is required with the --load and –-activate options for such devices.**Note**: The user should be aware that Slot 1 on Ultrastar NVMe PCIe SSDs is read-only and cannot be specified when using the --load option. |
|  | **Note**: This option is not valid for Ultrastar SAS and SATA SSDs. |
| --reset | The --reset option is used to perform a controller reset on the target device(s) which can be used to immediately start an activated firmware version. This option is only valid when used with the --activate option.**Note**: When targeting an Ultrastar SN200 SSD cabled in a dual port configuration, the NVMe controller and namespaces may not be visible to DM-CLI or the host operating system until after a power cycle of the host system unless the host system is capable of hot plug. This behavior is a side effect of firmware compliance with the NVMe and PCIe specifications. |
|  | **Note**: This option is not valid for Ultrastar SAS SSDs. |

**Options**

**Examples**

**To list information about the firmware image(s):**

dm-cli manage-firmware --list --path /dev/nvme0 --output-format mini

**OR**

dm-cli manage-firmware --path /dev/nvme0 --output-format mini

**To load a firmware image onto an NVMe controller:**

dm-cli manage-firmware --load --file /firmware/filename.bin --slot 2 --path /dev/nvme0

**To activate a firmware image on an NVMe controller:**

dm-cli manage-firmware --activate --slot 2 --path /dev/nvme0

**To activate a firmware image and perform a controller reset on an NVMe controller:**

dm-cli manage-firmware --activate --reset --slot 2 --path /dev/nvme0

**To load a firmware image onto a SCSI device:**

dm-cli manage-firmware --load --activate --file /firmware/filename.bin --path /dev/sda

**NVMe Controller Sample Output**

dm-cli manage-firmware --path /dev/nvme0 --output-format mini

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Running Firmware Version = KNGND090 (Loaded from Slot 3)

 [...]

Results for manage-firmware: Operation succeeded.

**Terminology**

The DM-CLI manage-firmware listing for NVMe controllers contains terminology that is explained in the following table:

|  |  |
| --- | --- |
| **Term** | **Description** |
| (Read-only) | The firmware slot is read-only. The firmware image in this slot cannot be updated. |
| (Loaded from Slot x) | The firmware slot from which the currently running firmware image was loaded. |
| (Next Running Firmware Slot) | The firmware slot containing the firmware image that will become the running firmware following the next device reset or system power-cycle. |

## manage-namespaces

The manage-namespaces command allows the user to perform interrelated namespace management tasks on NVMe controllers. The user can target multiple namespaces by specifying multiple --id *namespace-id* options in the command syntax; the [device-reference](#Device_Reference) must refer to a physical device.

|  |  |
| --- | --- |
|  | ***After execution of the*** dm-cli manage-namespaces ***command using the*** --attach***,*** --detach***,*** --delete***, or*** --resize ***options against an Ultrastar SN200 controller in a dual port cabling configuration, the NVMe controller and namespaces may not be visible to*** DM-CLI ***or the host operating system until after a power cycle of the host system unless the host system is capable of hot plug. This behavior is a side effect of firmware compliance with the NVMe and PCIe specifications.******The namespaces unit size in the Device Manageability VU log page for Omaha varies between drive models, which may not always match the input.***  |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli manage-namespaces | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--list] [--create] [--attach] [--detach] [--delete] |
|  | [--size SIZE] [--id ID] |
|  |  |
| Displays and manages namespaces on a capable physical device. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --list | Displays information from the operation. |
| --create | Executes the create action. |
| --attach | Executes the attach action. |
| --detach | Executes the detach action. |
| --delete | Executes the delete action. |
| --resize | Executes the resize action. |
| --size SIZE | Size in gigabytes. |
| --id ID | The identifier to be used for this operation. |
| --type | Namespace type to be created on the device. |

**Options**

|  |  |
| --- | --- |
| **Option** | **Description** |
| --list | The --list option will present information regarding the namespace(s) currently present on the device(s). This is also the default action and will be executed if no other options are specified. |
| --create | This option will create a new namespace on the target device with size specified by the --size option. The created namespace will be formatted with the default LBA format and DIF level, which will typically be a 512-byte sector size, 0 bytes of metadata, and a DIF level of 0. When using this option with Ultrastar SN100 and SN150 devices, the namespace will be attached to the controller by default. |
| --attach | This option will attach (if possible) the namespace specified by the --id option integer to the specified target device.**Note**: The --attach option cannot be used in conjunction with the --create option for Ultrastar SN200 Series devices.**Note**: Ultrastar SN200 SSDs are capable of sharing namespaces between two controllers if cabled in a dual port configuration. To accomplish this with DM-CLI, issue the manage-namespaces --attach command once against each controller. If the Ultrastar SN200 SSD is cabled to two host systems, the manage-namespaces --attach command must be issued once from each host system. |
| --detach | This option will detach the namespace specified by the --id option integer from the specified target device.**Note**: Ultrastar SN200 SSDs are capable of sharing namespaces between two controllers if cabled in a dual port configuration. To unconfigure namespace sharing with DM-CLI, issue the manage-namespaces --detach command against one or both controllers. If the Ultrastar SN200 SSD is cabled to two host systems, the manage-namespaces --detach command must be issued once from each host system. |
| --delete | This option will delete the namespace specified by the --id option integer from the specified target device. The namespace is automatically detached before deletion. |
| --resize | This option will change the size of the namespace specified by the --id option integer to the size specified by the --size option.**Note**: The --resize option is not supported by Ultrastar SN100,SN150, Ultrastar DC SN630 and Ultrastar DC SN640 SSDs. |
| --size SIZE | This option will set, in gigabytes, the size of the namespace. This option is only valid when used with the --create or --resize options. |
| --id ID | The --id option allows the user to target an existing namespace or multiple namespaces using the actual ID integer value created by the user, e.g., --id 1, --id 2, etc. This option is required when using the --create, --attach, --delete or --detach options.**Note**: The --id option cannot be used in conjunction with the --create option for Ultrastar SN200 Series devices. |
| --type | The --type option allows user to create private or shared namespaces for a NVMe controller. This option is only valid when used with the --create option. |

**Examples**

**To list all the current namespaces on an NVMe controller:**

dm-cli manage-namespaces --list --path /dev/nvme0 --output-format mini

**OR**

dm-cli manage-namespaces --path /dev/nvme0 --output-format mini

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Namespace 1 = 400 GB
 Namespace 2 = 50 GB (Shared)

 Namespace 3 = Detached

 Namespace 4 = 100 GB

Results for manage-namespaces: Operation succeeded.

**To create a new NVMe namespace:**

dm-cli manage-namespaces --create --id 3 --size 1600 --path /dev/nvme0

**To delete an NVMe namespace:**

dm-cli manage-namespaces --delete --id 3 --path /dev/nvme0

**To attach an existing detached NVMe namespace:**

dm-cli manage-namespaces --attach --id 3 --path /dev/nvme0

**To detach an NVMe namespace:**

dm-cli manage-namespaces –-detach --id 3 --path /dev/nvme0

**To resize an NVMe namespace:**

dm-cli manage-namespaces –-resize --size --400 --id 4 --path /dev/nvme0

**To create a new shared NVMe namespace:**

dm-cli manage-namespaces --create --id 2 --size 50 --path /dev/nvme0

dm-cli manage-namespaces --attach --id 2 --path /dev/nvme0

dm-cli manage-namespaces --attach --id 2 --path /dev/nvme1

**To create a new private NVMe namespace:**

dm-cli manage-namespaces ––create ––type private --size 50 --path /dev/nvme0

## manage-power

The manage-power command will list the available power states for a device and allows the user to apply a specific power state to a device. The [device-reference](#Device_Reference) must be a physical device, as namespaces are not valid.

|  |  |
| --- | --- |
|  | ***Ultrastar SN100 and SN150 Devices Only****: Issuing some* DM-CLI *commands, or performing a host reboot/power cycle after using the* manage-power *command to change the power state will revert the power state to its previous value. The user should therefore perform and complete all other device tasks before attempting to alter the power state.* |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli manage-power | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--list] [--change] [--state STATE] |
|  |  |
| Displays and controls power states of physical devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --list | Displays information from the option. |
| --change | Executes the change action. |
| --state STATE | The state to be used for this operation. |

**Options**

|  |  |
| --- | --- |
| **Option** | **Description** |
| --list | The --list option will present information regarding the power states that are available for the device. This is also the default action and will be executed if no other options are specified. |
| --change | This option will change and apply the power state on the targeted device. This option must be used in conjunction with the --state option. |
| --state STATE | This option specifies the power state that should be applied to the targeted device. This option is only valid when used with the --change option. The valid values for the power-state are those listed with the prefix of “Power State”. |

**Examples**

**To list the available power states for a device:**

dm-cli manage-power --list --path /dev/nvme0 --output-format mini

**OR**

dm-cli manage-power --path /dev/nvme0 --output-format mini

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Power State 1 = 25 W (Active)

 Power State 2 = 20 W

 Power State 3 = 15 W

 Power State 4 = 10 W

 Power State 5 = 10 W [no I/O]

Results for manage-power: Operation succeeded.

**To apply a valid power state to a device:**

dm-cli manage-power --path /dev/nvme0 --change --state 3

## manage-uefi

The manage-uefi command will update the UEFI driver on a capable device. The [device-reference](#Device_Reference) must be a physical device, as namespaces are not valid.

|  |  |
| --- | --- |
|  | ***The manage-uefi command is not supported for Ultrastar SN630 series SSDs****.*  |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli manage-uefi | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--update] |
|  |  |
| Updates the UEFI driver on physical devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --update | Executes the update action. |
| -f, --file FILE | File name or path. |
| --list--enable--disable | Displays information from the operation.Enable the UEFI driver Disable the UEFI driver. |

**Options**

|  |  |
| --- | --- |
| **Option** | **Description** |
| --update | This option will update the UEFI driver on the targeted device. This option must be used in conjunction with the --file option. |
| -f, --file FILE | This option specifies the power state that should be applied to the targeted device. This option is only valid when used with the --update option. |
| --list | This option will list the UEFI driver version for the targeted device. |
| --enable | This option will enable the UEFI driver for the targeted device. This option is only valid for Ultrastar SN640 series SSDs.  |
| --disable | This option will disable the UEFI driver for the targeted device. This option is only valid for Ultrastar SN640 series SSDs. |

**Examples**

**To update the UEFI driver on a device:**

dm-cli manage-uefi --path /dev/nvme0 --update --file /uefi/filename.bin

**To display the UEFI driver version for a device:**

dm-cli manage-uefi --path /dev/nvme0 --list

**To Enable the UEFI driver for a device:**

dm-cli manage-uefi --path /dev/nvme0 --enable

**To Disable the UEFI driver for a device:**

dm-cli manage-uefi --path /dev/nvme0 --disable

**Sample Output**

1. dm-cli manage-uefi --path /dev/nvme0 --list

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 UEFI Driver Version = 1c58-0023-105c

Results for manage-uefi: Operation succeeded.

2. dm-cli manage-uefi --path /dev/nvme0 --list

[/dev/nvme0]

 Product Name = ESSDRIVE
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 UEFI Driver Enabled = false

3. dm-cli manage-uefi --path /dev/nvme0 --enable

 Results for manage-uefi: Operation succeeded.

## prepare-for-removal

The prepare-for-removal command will instruct the operating system to stop issuing I/O to the target device; the device may then be safely removed from the system. The user must reboot the host or power-cycle the system before the OS will detect the device. This command is only valid for physical devices.

|  |  |
| --- | --- |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *The user must physically remove the device from the system and then reinstall the device for the operating system to detect it.* |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *The prepare-for-removal command is not supported for SAS devices managed by RAID controllers.* |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli prepare-for-removal | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  |  |
| Prepares physical devices for safe removal from the system. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |

**Example**

dm-cli prepare-for-removal --path /dev/nvme0

## reset-to-defaults

The reset-to-defaults command will restore the targeted physical device(s) to factory default settings. After completion of this operation, all user data will be erased, and format parameters and namespace configuration (if applicable) will be restored to default values. Neither the firmware nor the statistical reporting will be affected.

|  |  |
| --- | --- |
|  | ***The command is destructive. The user should backup all data currently stored on the device. All user data will be destroyed.*** |
|  | ***After execution of the*** dm-cli reset-to-defaults ***command against an Ultrastar SN200 controller in a dual port cabling configuration, the NVMe controller and namespaces may not be visible to*** DM-CLI ***or the host operating system until after a power cycle of the host system unless the host system is capable of hot plug. This behavior is a side effect of firmware compliance with the NVMe and PCIe specifications.*** |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli reset-to-defaults | [-o, --output-format FORMAT] [-c, --config PATH]{-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  |  |
| Resets physical devices to factory default configuration. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |

**Example**

dm-cli reset-to-defaults *--*path /dev/nvme0

## resize

The resize command will change the user capacity of the target physical device. After completion of this operation, all user data will be erased, and format parameters and namespace configuration (if applicable) will be restored to default values.

|  |  |
| --- | --- |
|  | ***The command is destructive. The user should backup all data currently stored on the device. All user data will be destroyed.*** |
|  | ***After execution of the*** dm-cli resize ***command against an Ultrastar SN200 controller in a dual port cabling configuration, the NVMe controller and namespaces may not be visible to*** DM-CLI ***or the host operating system until after a power cycle of the host system unless the host system is capable of hot plug. This behavior is a side effect of firmware compliance with the NVMe and PCIe specifications.*** |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli resize | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {- u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--size SIZE] [--size-blocks BLOCKS] |
|  |  |
| Changes the user capacity of physical devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --size SIZE | Size in gigabytes. |
| --size-blocks BLOCKS | Size in blocks. |

**Options**

|  |  |
| --- | --- |
| **Option** | **Description** |
| --size SIZE | The new user capacity for the target device expressed in gigabytes. |
| --size-blocks BLOCKS | The new user capacity for the target device expressed in logical blocks.**Note**: This option is not valid for Ultrastar NVMe SSDs. |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *The values for* SIZE *and* BLOCKS *must fall within acceptable ranges supported by the device, and these ranges vary by device type and default capacity. Please consult your device product manual for information on these ranges.* |

**Examples**

**To resize an NVMe controller to a new value in gigabytes:**

dm-cli resize --size 1600 --path /dev/nvme0

**To resize a SCSI device to a new value in logical blocks:**

dm-cli resize --size-blocks 781422768 --path /dev/sda

## sanitize

The sanitize command allows the user to perform block, overwrite and cryptographic sanitization of physical devices.

|  |  |
| --- | --- |
|  | ***The command is destructive. The user should backup all data currently stored on the device. All user data will be destroyed.*** |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *The sanitize operation is prohibited by most SAS Host Bus Adapters and RAID controllers on Windows.* |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *The* sanitize *command can run on Ultrastar SAS SSD devices for several hours before it completes. The* get-state *command (specifically, the Device Status output) can be used to determine whether the sanitize operation has been completed.* |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli sanitize | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {- u, --uid UID | -p, --path PATH | -a, --alias ALIAS} [--type TYPE] [--invert] [--count NUM] |
|  | [--pattern PATTERN] [-f, --file FILE] |
|  | [-w, --wait] [--status]  |
|  |  |
| Performs a sanitize operation to erase all user data on physical devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --type TYPE | Type of this operation to perform. |
| --invert | Whether to invert the pattern as part of this operation. |
| --count NUM | Number of times to execute the operation. |
| --pattern PATTERN | Pattern that should be used for this operation. |
| -f, --file FILE | File name or path. |
| -w, --wait | Blocks until this operation completes. |
| --status | Displays status of this operation. |
|  |  |

**Options**

|  |
| --- |
| **--type TYPE** |
| The TYPE specifies the type of sanitization operation. The valid values for TYPE are block, cryptographic and overwrite. |
| block | The block option will write a predetermined, device-specific pattern to all blocks containing user data. |
| cryptographic | The cryptographic option will delete the encryption key previously used to encrypt the user data. **Note**: Snowbird controller SSDs do not currently support the cryptographic sanitize type |
| overwrite | The overwrite option will write the pattern as specified by the --pattern option to all blocks containing user data.**Note**: Ultrastar SAS SSDs and Snowbird controller SSDs do not currently support the overwrite sanitize type. |
| exitfailuremode | This action is only valid when the drive is already in the sanitize failed state, if the drive is not in a sanitized failed state, a sanitize command with the ‘exitfailuremode’ will be rejected with an invalid field error. |
|  |  |
| **--pattern PATTERN** |
| The PATTERN value specifies the pattern that will be used for the overwrite operation. This option is only valid for the overwrite operation; the option is invalid if the --file option is specified. If neither the --pattern nor --file options are specified, the default value used for the pattern is 0xFFFFFFFF. |
| **-f, --file FILE** |
| The FILE value specifies the path and filename of a file containing a data pattern that will written to all user data blocks during an overwrite operation. The option is only valid for the overwrite operation; the option is invalid if the --pattern option is specified. If neither the --pattern nor --file options are specified, the default value used for the pattern is 0xFFFFFFFF. |
| **--invert** |
| The --invert flag indicates that the --pattern option or that the value within the filename as specified by the --file option should be inverted each time it is written. This option is only valid for the overwrite operation; the --file or --pattern options must also be specified. If the--invert flag is not used, then the data pattern will not be inverted (default behavior). |
| **--count NUM** |
| The NUM value indicates the number of times all user data blocks will be written during the overwrite operation. The option is only valid for the overwrite operation; the --file or--pattern options must also be specified. If the --count NUM option is not used, then the data blocks are written only once. |
| **-w, --wait** |
| The --wait flag will cause the command to block any other DM-CLI command line input from the console until the sanitize operation completes. |
| **--status** |
| The --status option will report the status of the currently running or previously completed sanitize operation, as well as a running percentage if a sanitize operation is currently in progress. |

**Examples**

|  |  |
| --- | --- |
|  | ***Ultrastar SAS SSDs and Snowbird controller SSDs do not support the*** overwrite ***sanitize type.******Snowbird controller SSDs do not support the*** cryptographic ***sanitize type.*** |

**To perform a** block **sanitize operation:**

dm-cli sanitize --type block --path /dev/sda

**To perform a** cryptographic **sanitize operation:**

dm-cli sanitize --type cryptographic --path /dev/sda

**To perform an** overwrite **sanitize operation:**

dm-cli sanitize --type overwrite --path /dev/sda

**To perform an** overwrite **sanitize operation using the --pattern option:**

dm-cli sanitize --type overwrite --pattern <pattern> --path /dev/sda

**To perform an** overwrite **sanitize operation using the --file option:**

dm-cli sanitize --type overwrite --file <path/patternfile> --path /dev/sda

**To perform an** overwrite **sanitize operation using the --invert option:**

dm-cli sanitize --type overwrite --pattern --file <path/patternfile>
--invert --path /dev/sda

**To perform an** overwrite **sanitize operation using the --count option:**

dm-cli sanitize --type overwrite –pattern --file <path/patternfile>
--count 10 --path /dev/sda

**To display a running status of any sanitize operation:**

dm-cli sanitize --status --path /dev/sda

[/dev/sda]

 Product Name = Ultrastar SS300
 Device Type = SCSI Device

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Operation Status = Sanitize in Progress

 Operation Active = true

 Completion Percentage = 50

Results for sanitize: Operation succeeded.

**To prevent any** DM-CLI **command input during any sanitize operation, add the --wait option:**

dm-cli sanitize --type overwrite --wait --path /dev/sda

**scan**

The scan command will enumerate all DM-CLI supported storage devices installed in the host system.

|  |  |
| --- | --- |
|  | *The* dm-cli scan *command will automatically assign aliases to NVMe controllers and namespaces. See* [alias](#CLI_Alias) *for more information*. |
|  |  *The set of properties shown in the* dm-cli scan *command may vary by device type.* |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli scan | [-o, --output-format FORMAT] [-c, --config PATH] |
|  |  |
| Lists the storage devices attached to this host. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |

**Example**

dm-cli scan

**Sample Output**

dm-cli scan

[1C58CJH0020002F8HUSMR7616BHP3010023]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Vendor Name = HGST

 Model Name = HUSMR7616BHP301

 Vendor Id = 1C58

 Device Id = 0023
 NVM Subsystem UID = 1C58CJH0020002F8HUSMR7616BHP301

[000CCA0061450001]

 Device Type = NVMe Namespace

 Device Path = /dev/nvme0n1

 UID = 000CCA0061450001

 Alias = @nvmens0

 Parent Product Name = Ultrastar SN260
 Parent Device Type = NVMe Controller

 Parent Device Path = /dev/nvme0

 Parent UID = 1C58CJH0020002F8HUSMR7616BHP3010023
 NVM Subsystem UID = 1C58CJH0020002F8HUSMR7616BHP301

 Namespace ID = 1

[5000CCA02B005870]

 Product Name = Ultrastar SSD800MH-400
 Device Type = SCSI Device

 UID = 5000CCA02B005870

 Alias = @scsi0

 Vendor Name = HGST

 Model Name = HUSMH8040ASS200

 Parent Device Type = MegaRAID Controller

 RAID Controller ID = 0

 RAID Device ID = 20

Results for scan: Operation succeeded on 3 of 3 devices.

## secure-erase

The secure-erase command will perform a secure erase of the target physical device using a specified erase level. After completion of this operation, all user data will be erased, and format parameters will be restored to default values.

|  |  |
| --- | --- |
|  | ***The command is destructive. The user should backup all data currently stored on the device. All user data will be destroyed.*** |
|  | ***After execution of the*** dm-cli secure-erase ***command against an Ultrastar SN200 controller in a dual port cabling configuration, the NVMe controller and namespaces may not be visible to*** DM-CLI ***or the host operating system until after a power cycle of the host system unless the host system is capable of hot plug. This behavior is a side effect of firmware compliance with the NVMe and PCIe specifications.*** |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli secure-erase | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | -p, --path PATH | -a, --alias ALIAS} |
|  | [--type TYPE] |
|  |  |
| Securely erases all user data from physical devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --type TYPE | Type of this operation to perform. |

**Options**

|  |  |  |
| --- | --- | --- |
| **Option** | **Value** | **Description** |
| --type TYPE | normal | Executes normal security erase operation. Note: Supported on Ultrastar SA210 SSDs only. |
| enhanced | Executes enhanced security erase operation.Note: Supported on Ultrastar SA210 SSDs only. |
| user | All user content present in the NVM subsystem will be erased. |
| cryptographic | All user content present in the NVM subsystem will be erased by deleting the encryption key with which the user data was previously encrypted.  |
|  |  | **Note**: The user should be aware that not all devices support the cryptographic option. |

**Examples**

**To perform a** user **data secure erase:**

dm-cli secure-erase --type user --path /dev/nvme0

## secure-purge

The secure-purge command will perform a purge on a target physical device. Whereas [secure-erase](#secure_erase) only erases the user data areas, secure-purge will erase all the data (user and system areas) and then fills (overwrites) each addressable block of memory with a predetermined pattern.

|  |  |
| --- | --- |
|  | ***The command is destructive. The user should backup all data currently stored on the device. All user data will be destroyed.*** |
| C:\Users\jrau\Desktop\Temp\CheckMark.tif | *The* secure-purge *command can run on Ultrastar NVMe PCIe SSDs**for several hours before it completes. The* get-state *command (specifically, the Device Status output) can be used to determine whether the purge operation has been completed.* *Currently* secure-purge *command is not supported to Snowbird controller device.*  |

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli secure-purge | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | p, --path PATH | -a, --alias ALIAS} |
|  | [--status] |
|  |  |
| Performs a secure purge on physical devices. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --status | Displays status of this operation. |

**Options**

|  |  |
| --- | --- |
| **Option** | **Description** |
| --status | The --status option will report the status of the currently running or previously completed secure purge operation, as well as a running percentage if a secure purge operation is currently in progress. |

**Examples**

**To perform a secure purge on the device with a confirmation prompt:**

dm-cli secure-purge --path /dev/nvme0

**To display a running status of any secure purge operation:**

dm-cli secure-purge --status --path /dev/nvme0

[/dev/nvme0]

 Product Name = Ultrastar SN260
 Device Type = NVMe Controller

 Device Path = /dev/nvme0

 UID = 1C58CJH0020002F8HUSMR7616BHP3010023

 Alias = @nvme0

 Operation Status = Secure Purge in Progress

 Operation Active = true

 Completion Percentage = 50

Results for secure-purge: Operation succeeded.

**To prevent any** DM-CLI **command input during any secure purge operation, add the --wait option:**

dm-cli secure-purge --wait --path /dev/nvme0

## self-test

The self-test command will execute, abort, and show status of device self-test on target physical devices.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli self-test | [-o, --output-format FORMAT] [-c, --config PATH] |
|  | {-u, --uid UID | p, --path PATH | -a, --alias ALIAS} |
|  | [--mode MODE] [--abort] [--status]  |
|  |  |
| Executes device self-tests. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |
| -u, --uid UID | Device unique identifier. |
| -p, --path PATH | Platform path of the device as shown in the output of dm-cli scan. |
| -a, --alias ALIAS | User supplied name for the device. |
| --mode MODE | The mode to be used for this operation. |
| --abort | Aborts the operation. |
| --status | Displays status of this operation. |

**Options**

|  |  |  |
| --- | --- | --- |
| **Option** | **Value** | **Description** |
| --mode MODE | default | Execute the default self-test. |
| backgroundshort | Execute the short self-test in background mode. |
| backgroundextended | Execute the extended self-test in background mode. |
| foregroundshort | Execute the short self-test in foreground mode. |
| foregroundextended | Execute the extended self-test in foreground mode. |
| short | Execute the short device self-test operation. **Note**: Supported on Ultrastar SN630, SN640, SN740, SN840, SN340 and CL SN720 NVMe controllers only. |
| extended | Execute the extended device self-test operation.**Note**: Supported on Ultrastar SN630, SN640, SN740, SN840, SN340 and CL SN720 NVMe controllers only. |
| --abort | Not Applicable | Aborts a background self-test that is currently in progress. **Note**: This option is only valid for if a background self-test is in progress. |
| --status | Not Applicable | The --status option will report the status of the currently running or previously completed self-test, as well as a running percentage if a self-test is currently in progress. |

**Examples**

**To perform a** default **self-test on the device:**

dm-cli self-test --mode default --path /dev/sda

**To perform a** foregroundextended **self-test on the device:**

dm-cli self-test --mode foregroundextended --path /dev/sda

**To display the status of a self-test:**

dm-cli self-test --status --path /dev/sda

[/dev/sda]

 Product Name = Ultrastar SS300
 Device Type = SCSI Device

 Device Path = /dev/sda

 UID = 5000CCA08A000788

 Alias = @scsi0

 Operation Status = Self Test In Progress

 Operation Active = true

 Completion Percentage = 50

Results for self-test: Operation succeeded.

**To abort a self test in progress:**

dm-cli self-test --abort --path /dev/sda

## version

The version command will obtain and display the current build and version of the software. The output consists of a string that displays the current software version.

**Synopsis**

|  |  |
| --- | --- |
| usage: dm-cli version | [-o, --output-format FORMAT] [-c, --config PATH] |
|  |  |
| Displays DM-CLI build and version information. |
|  |  |
| OPTIONS: |  |
| -o, --output-format FORMAT | Output format for the command. Valid output formats are "text", “mini”, and "json". The default is “mini”. |
| -c, --config PATH | Path to the DM-CLI configuration file. |

**Example**

dm-cli version

**Output**

 DM-CLI Version = 1.x.x

 Build Date = 2018-01-24T09:11:02

 Build Host = dmtest-2

 Commit ID = 664100bba691729486a02e11a2b2623d43ec639a

 Ref Spec = refs/heads/develop

Results for version: Operation succeeded.