# User Guide

## Storage Executive Command Line Interface

## Introduction

This guide describes how to use Micron's Storage Executive command line interface (CLI) to monitor, manage, and configure Micron solid state drives (SSDs).

The CLI provides a list of commands for configuration and management, including:

- View all drives installed in a system and see current drive status and capacity, temperature, firmware version, and driver information
- View SMART attributes and data/error logs
- Run SMART self tests
- Update firmware
- Retrieve debug data
- Configure drive settings including interrupt coalescing, over-provisioning and Flex Capacity levels
- Remove all data from a drive by performing a sanitize drive, sanitize crypto scramble, physical security ID (PSID) revert, or secure erase operation
- Run the STANDBY IMMEDIATE command
- Prepare an NVMe drive for safe removal from a system
- Manage the namespace on an NVMe drive

For instructions on installing Storage Executive or using the Storage Executive graphical user interface, see the *Storage Executive User Guide*.


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# About the CLI

The Storage Executive command line interface (CLI) provides a list of commands for managing and monitoring supported Micron and Crucial SSDs in a local system. The CLI is intended for system administrators and can be used to automate Storage Executive operations.

## Supported SSDs

| SSD | Model Number | |
|---|---|---|
| Micron NVMe™ | • 7100 Series<br>• 9100 Series<br>• 9200 Series | |
| Micron SAS | • S610DC<br>• S630DC<br>• S650DC<br>• S655DC | |
| Micron SATA | • 5100 Series<br>• 1100<br>• M500<br>• M500DC<br>• M500IT | • M510<br>• M510DC<br>• M550<br>• M600<br>• P400m |
| Crucial SATA | • MX-series<br>• BX-series<br>• M-series | |

## RAID Controller Support

| RAID Controller | Details |
|---|---|
| Avago MegaRAID | Drives connected to MegaRAID controllers appear with the following device name:<br>mraidX:Y<br>Where X indicates the ID of the MegaRAID controller and Y indicates the ID of the drive behind the controller. |

## Running the CLI

To run the CLI, execute the following in a command prompt:

Windows: **msecli.exe**

Linux: **msecli**


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## Common Command Options

The CLI provides the following options for all commands:

| Option | Description |
|---|---|
| **-r** | Runs the CLI in silent mode. |
| **-n** | Retrieves specified information for the given device name. |
| **-s** | Saves the output of the command to the specified file. |

## Obtaining Help

To obtain CLI usage information, enter the following in the command prompt:
**msecli -?**

## Using Silent Mode

In silent mode, the CLI does not display output on the screen and does not request user input, if any, during its operation. If a command requires user confirmation, the default input value (yes) is used for those commands.

To run the CLI in silent mode, enter the following in the command prompt:
**msecli -L -r**

**Figure 1: CLI in Silent Mode**

## Saving Command Output

The output of every command issued in the CLI can be saved as a .txt file. This file is created in the location from which the command is executed (Storage Executive installation folder by default), unless an absolute path is given.

1. At the command prompt, run the command for which output will be saved.
2. Enter the following in the command prompt: **msecli -L -s <output file name>**
   Replace **<output file name>** with the name for the saved file.

   The command prompt displays the content of the saved file.


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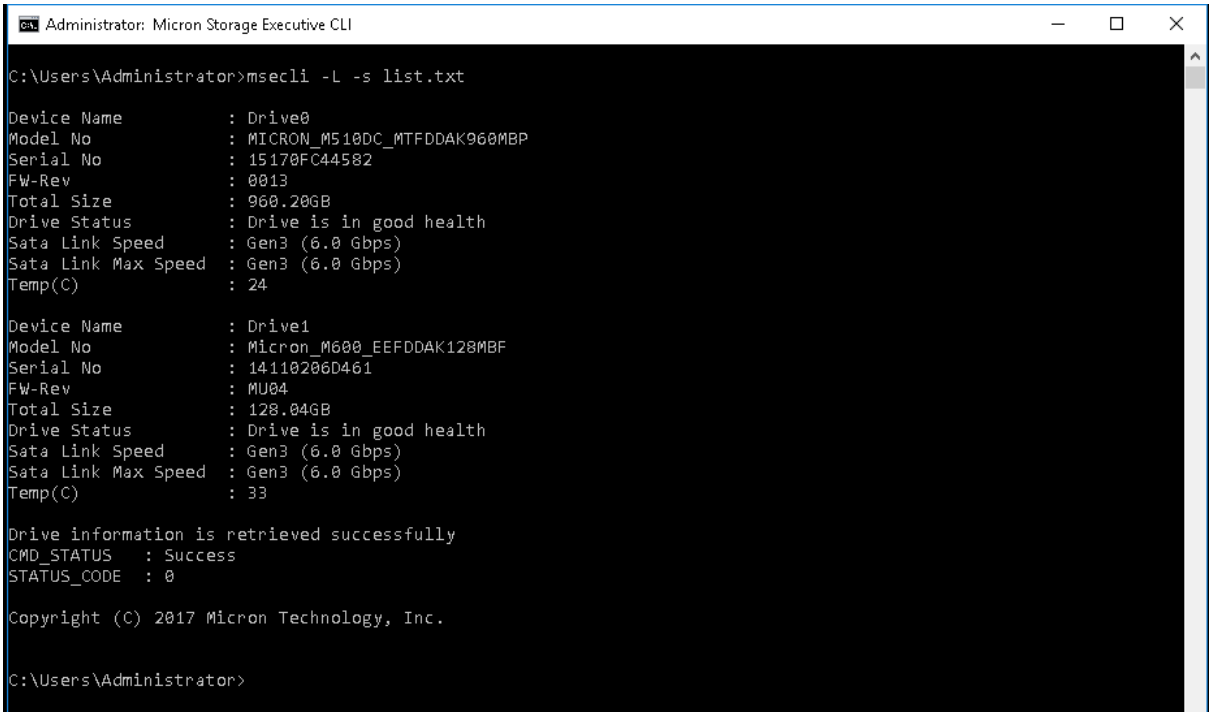
**Figure 2: Displaying Saved Output**





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# Displaying CLI Usage

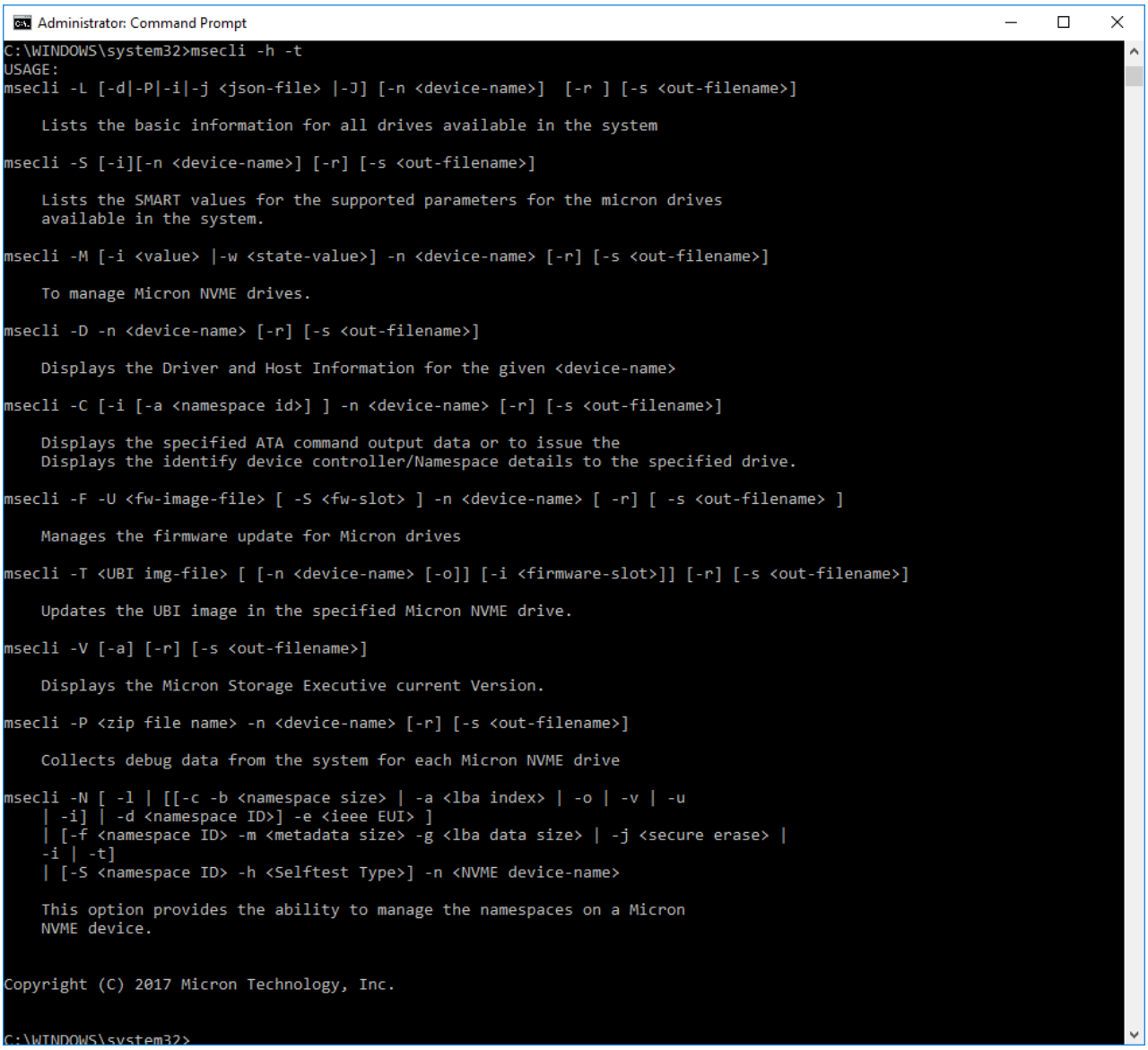
Storage Executive supports many commands to manage Micron SSDs. Some commands are common to all Micron SSDs while others are specific to a certain type of SSD; for example, NVMe (7100 series, 9100 series, etc.) or SATA (M500, M510, M550, etc.).

To determine the commands available for a specific SSD or type of SSD, issue the following commands in this section.

## Displaying NVMe SSD Commands

Enter the following at the command prompt: **msecli -h -t**

**Figure 3: NVMe SSD Commands**





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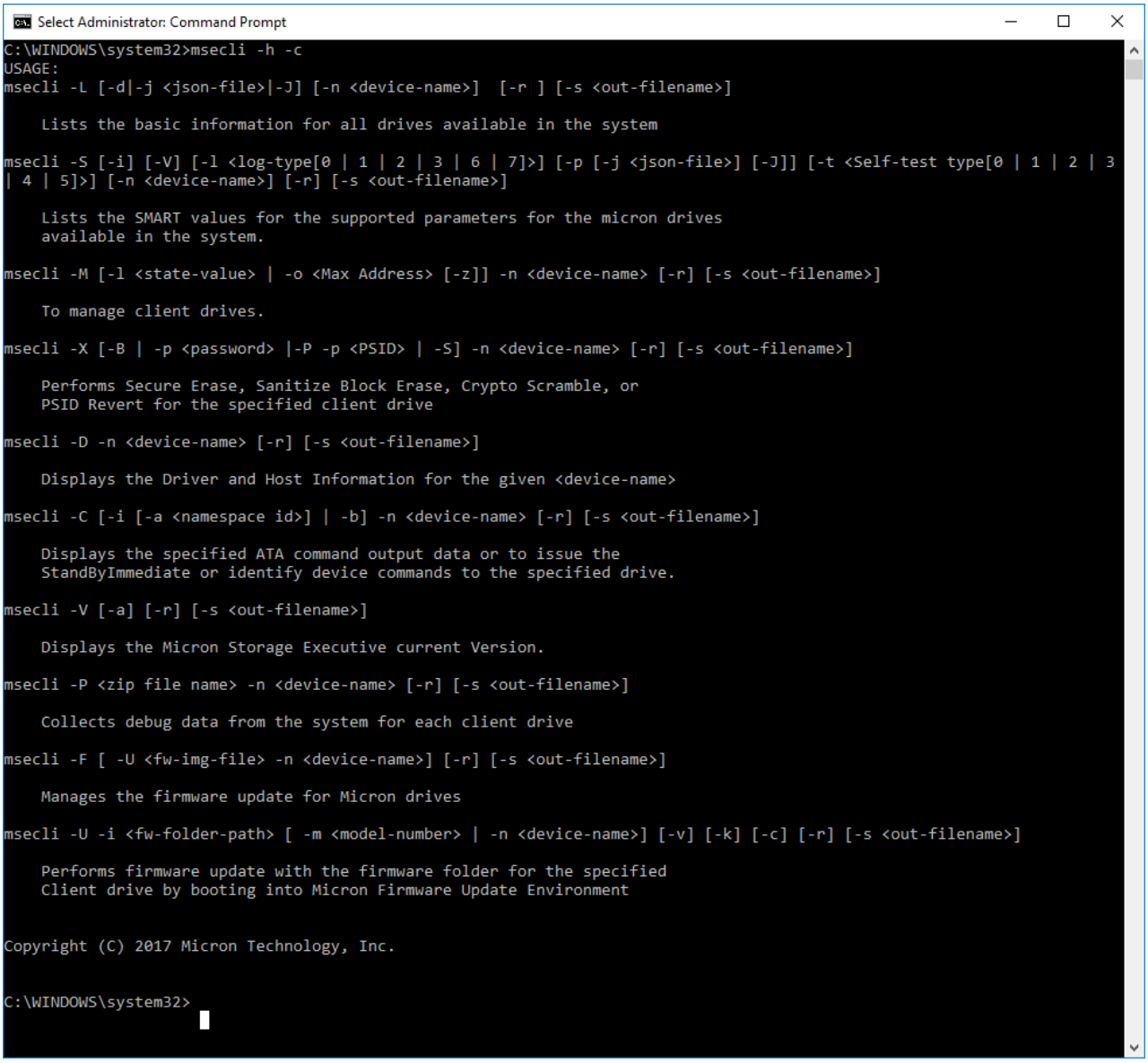
## Displaying SATA SSD Commands

Enter the following at the command prompt: **msecli -h -c**

**Figure 4: SATA SSD Commands**





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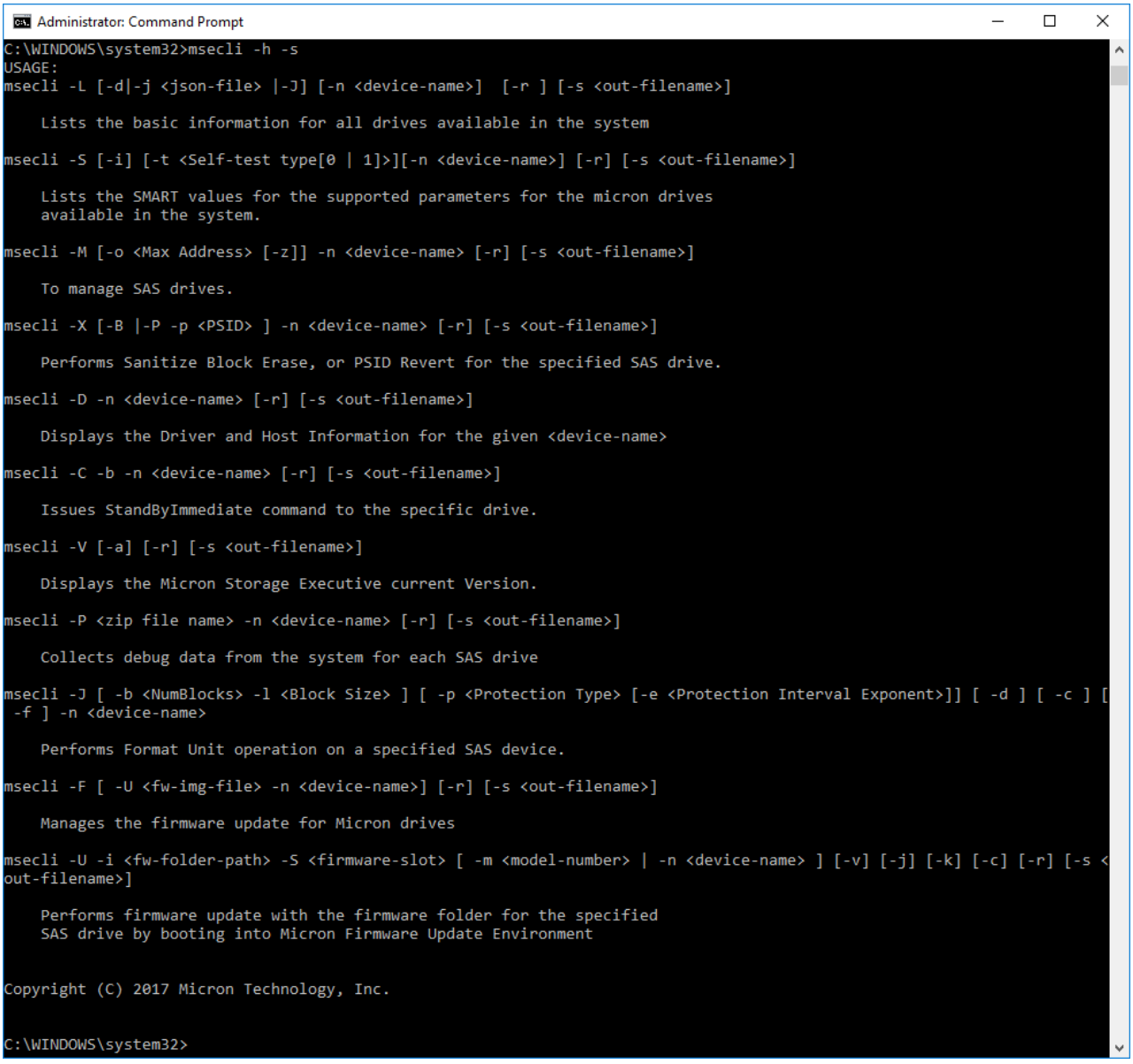
## Displaying SAS SSD Commands

Enter the following at the command prompt: **msecli -h -s**

**Figure 5: SAS SSD Commands**





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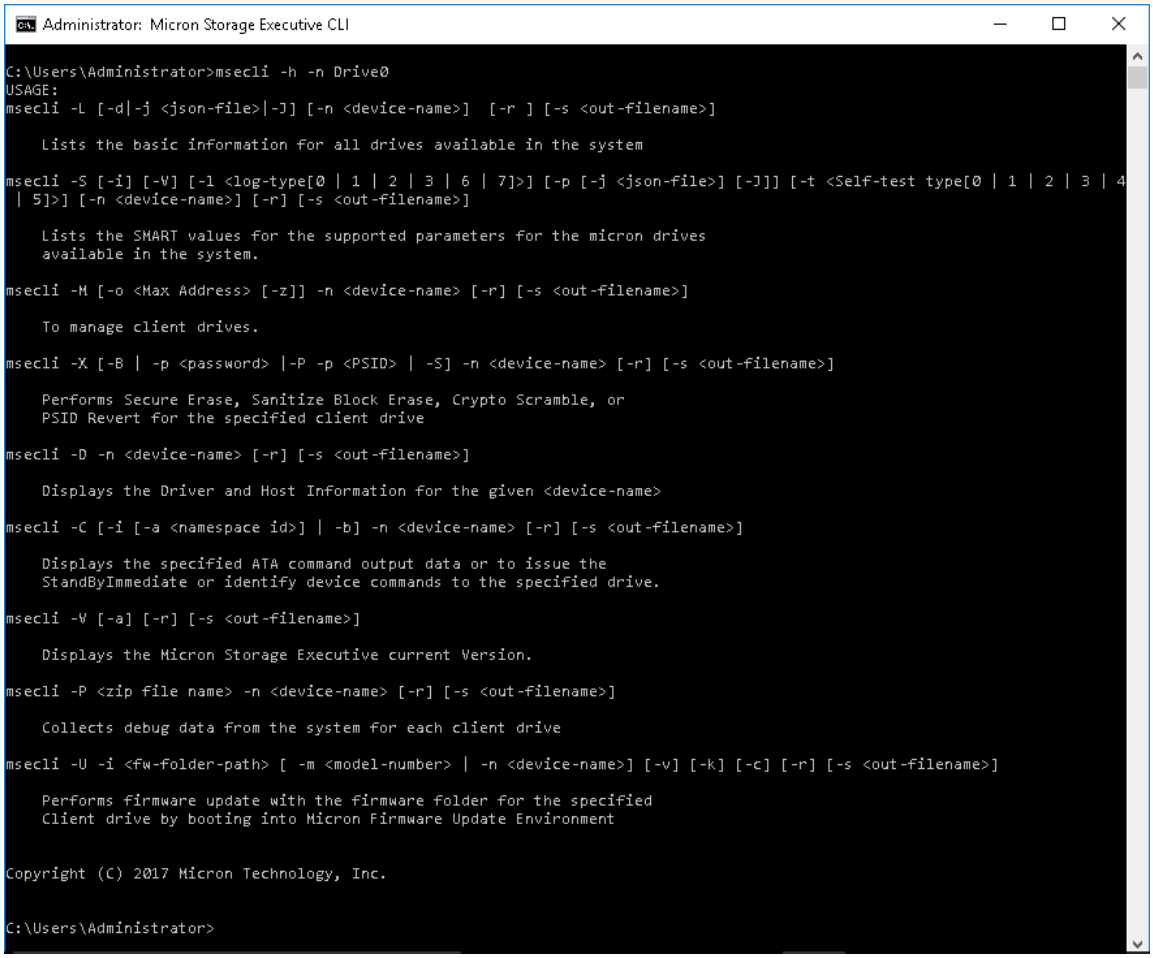
## Displaying Commands for a Specific SSD

Enter the following at the command prompt: **msecli -h -n <device-name>**

**Figure 6: Specific SSD Commands**





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# Displaying Drive Information

This section describes how to view:

- Basic and detailed drive information for all drives in a system or a specific drive
- Driver information
- ATA Identify Device data for a drive
- Firmware slot information (NVMe drives only)
- PCIe information (NVMe drives only)

## Displaying Basic Information for All Drives in a System

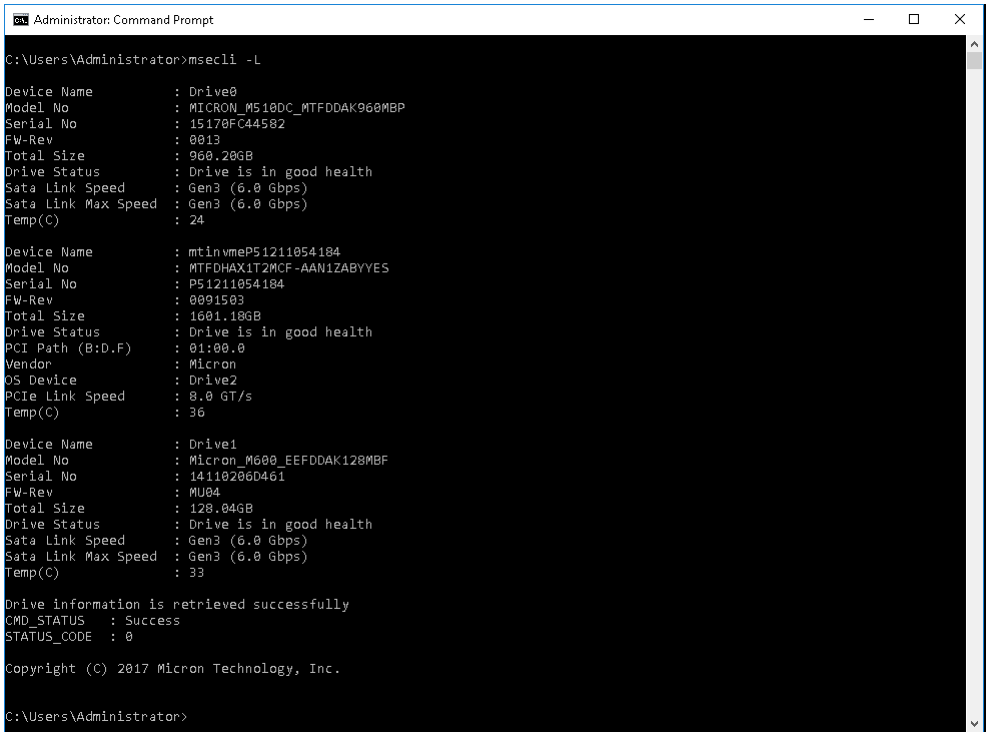
Use the following instructions to view basic information for all drives in a host system, including the drive's device name, model number, serial number, capacity, and status of each drive. All measurements for storage are displayed in gigabytes (GB). The drive's device name is necessary to issue subsequent commands to a drive.

**Note**: An error message displays if no drives are connected to the host system. PCI path is displayed in hexadecimal value.

Usage: **msecli -L [-d|-P| [-n <device-name>] [-r ] [-s <out-filename>]**

1. Enter the following at the command prompt: **msecli -L**
2. The CLI displays information about all drives in the host system.

**Figure 7: Details for all Drives in the Host System**





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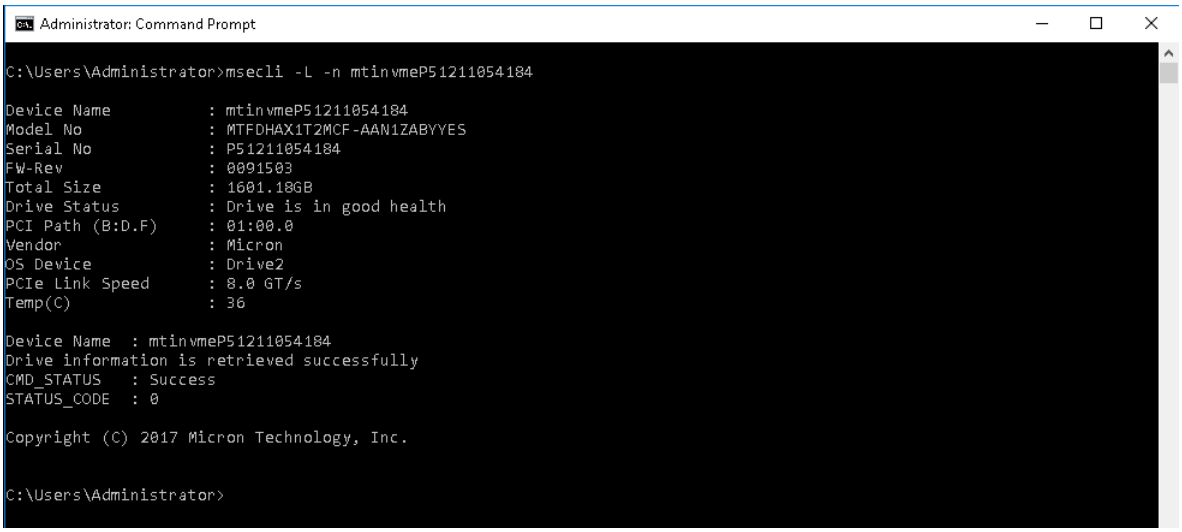
## Displaying Basic Information for a Specific Drive

Use the following instructions to view basic information for a specific drive, including the model number, serial number, capacity, and drive status.

Usage: **msecli -L [-d|-P| [-n <device-name>] [-r ] [-s <out-filename>]**

1. Enter the following at the command prompt: **msecli -L -n <device-name>** Replace **<device-name>** with the drive's device name.
2. The CLI displays information about the specified drive.

**Figure 8: Details for a Specific Drive**





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## Displaying Detailed Drive Information

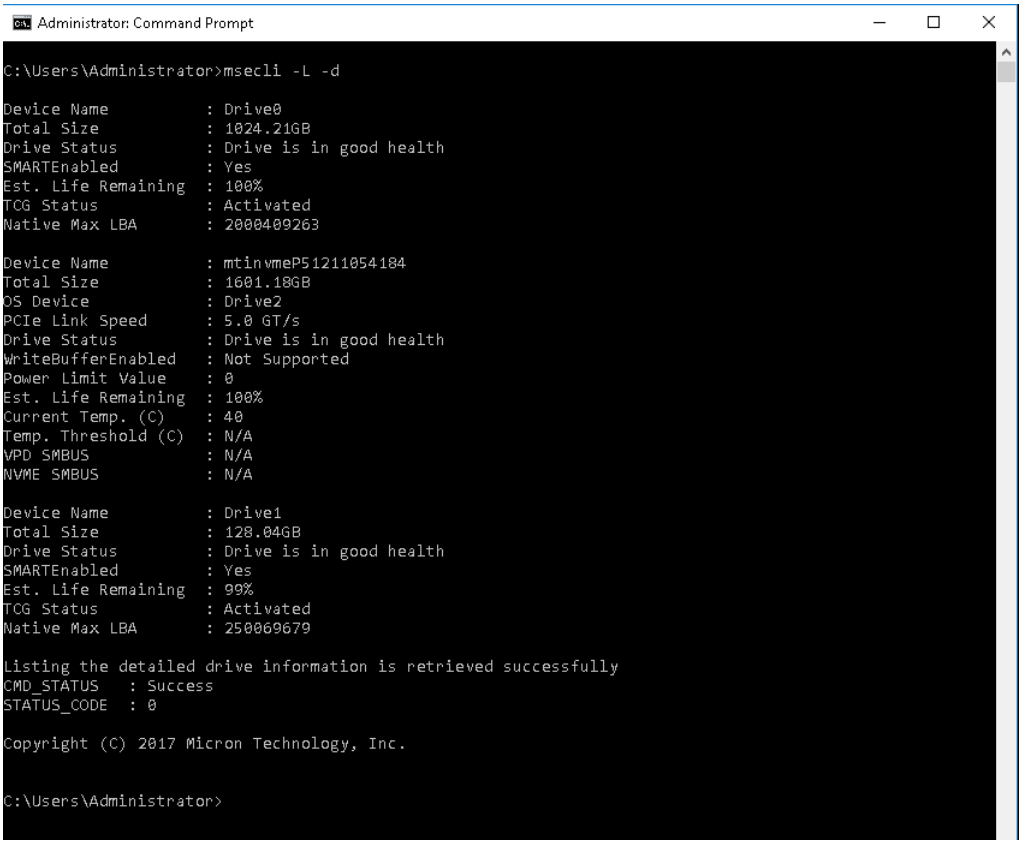
Use the following instructions to view detailed information about all available drives in the host system, including:

- Device name
- Total (available) size
- Drive status
- SMART enabled status
- Estimated life remaining
- TCG status
- Power limit status
- Native max LBA details
- Interrupt coalescing value (NVMe drives)
- Write buffer status (NVMe drives)

Usage: **msecli -L [-d|-P| [-n <device-name>] [-r ] [-s <out-filename>]**

1. Enter the following at the command prompt: **msecli -L -d**
2. The CLI displays detailed information about all drives in the host system.

**Figure 9: Detailed Drive Information**





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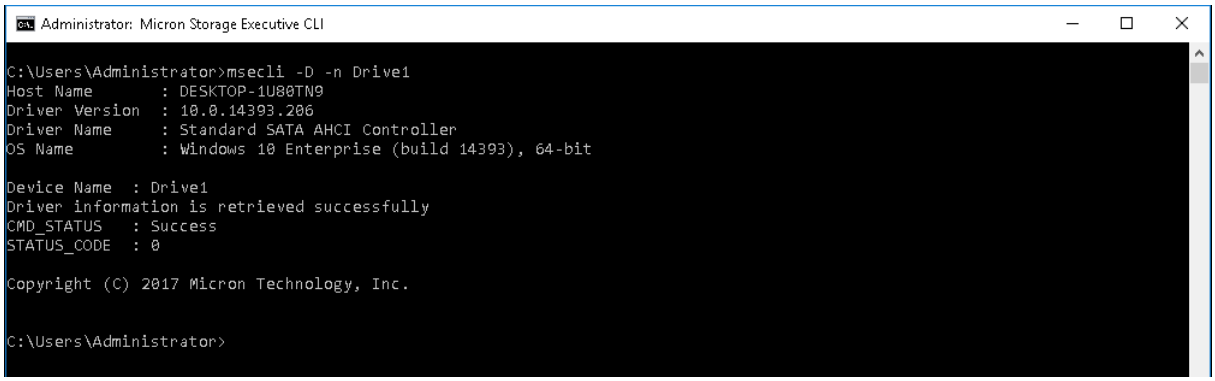
## Displaying Driver Information

Use the following instructions to display information about the driver, host operating system, and host name for a specific drive.

Usage: **msecli –D –n <device-name>** [**-r**] [**-s <out-filename>**]

1. Enter the following at the command prompt: **msecli -D -n <device-name>** Replace **<device-name>** with the drive's name.
2. The CLI displays driver information for the specified drive.

**Figure 10: Driver Information**



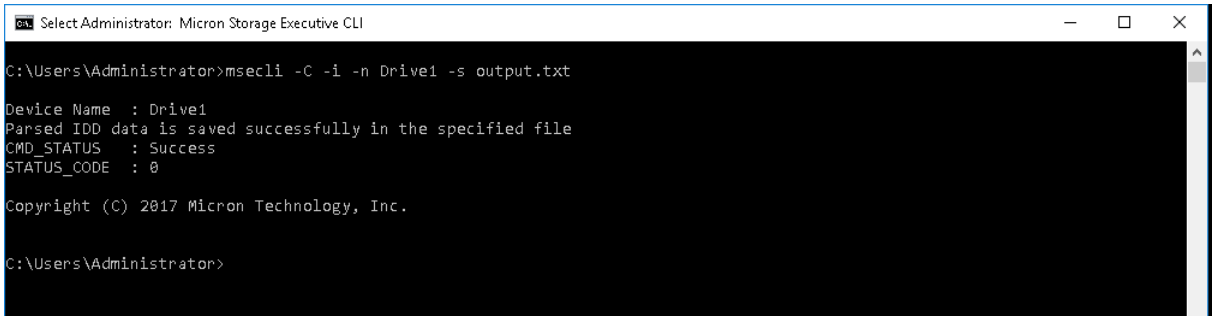

## Displaying ATA Identify Device Data

ATA identify device data can be saved to a text file or output to the screen. It is recommended to save the data to a text file using the **-s** option to ensure all parsed identify data can be read.

Usage: **msecli -C -i -n <device-name>** [**-s output.txt**]

1. Enter the following at the command prompt: **msecli –C -i -n <device-name>**.
2. When finished, the data outputs to the console or specified file.

**Figure 11: Display ATA Identify Device Data**





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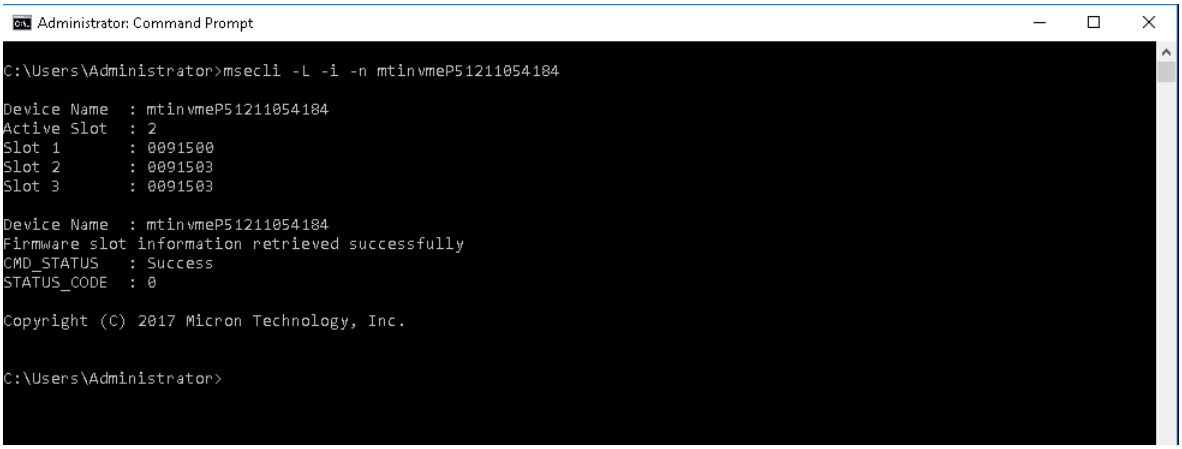
## Displaying Firmware Slot Information (NVMe Drives Only)

Use the following command to display firmware slot information for an NVMe drive.

Usage: **msecli -L -i -n <device name>**

1. Enter the following at the command prompt: **msecli -L -i -n <device-name>**
2. The CLI displays firmware slot information about the specified drive.

**Figure 12: Firmware Slot Information for an NVMe Drive**





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## Displaying PCIe Information (NVMe Drives Only)

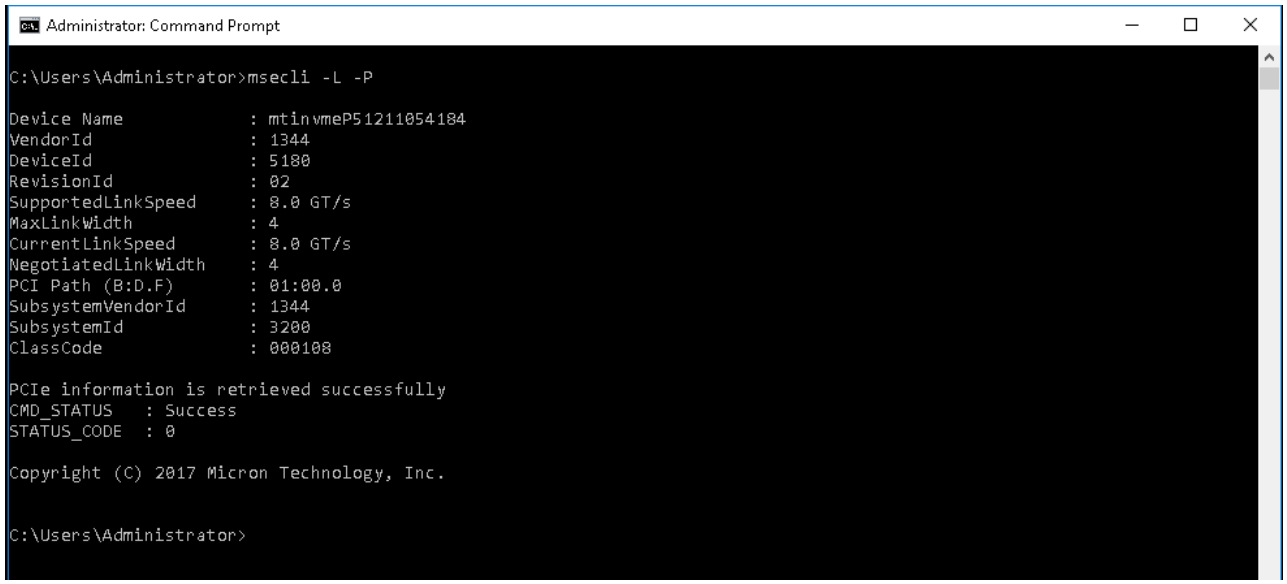
Use the following instructions to display PCIe information for an NVMe drive, including:

- Device name
- Vendor ID
- Device ID
- Revision ID
- Supported PCIe link speeds
- Maximum PCIe link width
- Current PCIe link speed
- Negotiated PCIe link width
- PCI location (path) of the PCIe controller (PCI bus slot info)
- Subsystem vendor ID
- Subsystem ID
- Class code

Usage: **msecli -L [-d|-P| [-n <device-name>] [-r ] [-s <out-filename>]**

1. Enter the following at the command prompt: **msecli -L -P**
2. The CLI displays information for each available NVMe drive.

**Figure 13: PCIe Information**





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# Displaying SMART Data and Error Logs

Self-Monitoring, Analysis, and Reporting Technology (SMART) is a monitoring framework used to detect and report various indicators of consistency and anticipate failures. SMART must be enabled on a drive to display data and logs for the drive.

This section describes how to:

- Display SMART data
- Display SMART error and self-test logs

## Displaying SMART Data

Use the following instructions to display a list of SMART attributes supported by each drive in the system. The CLI displays details for each attribute, including the value, threshold, and status.

For a list of SMART attributes and attribute IDs, see Appendix A. SMART Attributes and Drive Statistics (page 42).

Usage: **msecli -S** [**-i**] [**-V**] [**-l <log-type**[**0 | 1 | 2 | 3 | 6 | 7**]**>**] [**-p** [**-j <json-file>**] [**-J**]] [**-t <Self-test type**[**0 | 1 | 2 | 3 | 4 | 5**]**>**] [**-n <device-name>**] [**-r**] [**-s <out-filename>**]

1. To display SMART data for a specific drive, enter the following at the command prompt: **msecli -S -n <device-name>**
   To display SMART data for all drives, enter the following: **msecli -S**
2. The CLI displays the SMART data.

   In Figure 14, the **Temp. Throttle Threshold in C** value is the temperature at which the firmware starts to throttle write performance to keep the drive within the operating temperature range. The **Temp. Shutdown Threshold in C** value is the temperature at which the firmware shuts down I/O traffic to prevent the drive's components from operating out of the specified range.


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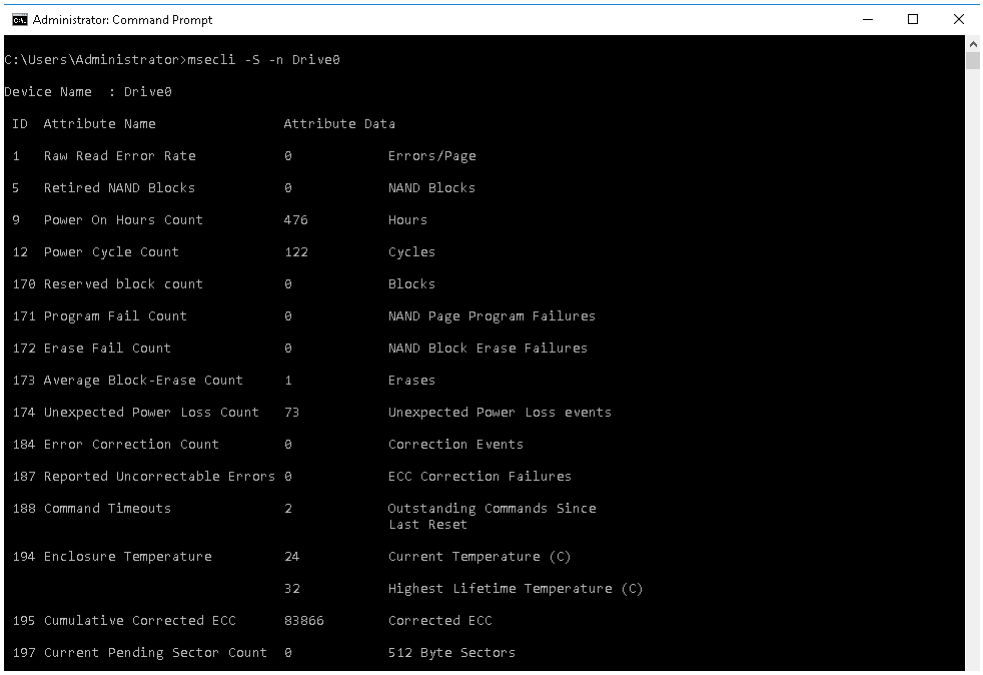
**Figure 14: SMART Attributes**




## Displaying SMART Logs

Use the following instructions to display available SMART logs. Analyzing these logs helps to identify errors in a drive.

**Note:** This feature is not supported by NVMe and SAS drives.

The following SMART logs can be generated:

- **SMART error log directory (log type 0)**: Displays the number of log pages.
- **SMART summary error log (log type 1)**: Displays a summary of SMART log errors.
- **SMART comprehensive error log (log type 2)**: Provides logging for 28-bit addressing only. It includes uncorrectable errors, ID Not Found errors for which the LBA request was valid, server errors, and write fault errors. This log does not include errors attributed to the receipt of faulty commands.
- **SMART extended error log (log type 3)**: Provides logging for 28-bit and 48-bit entries. It includes uncorrectable errors, ID Not Found errors for which the LBA request was valid, server errors, and write fault errors. This log does not include errors attributed to the receipt of faulty commands.
- **SMART self test log (log type 6)**: Displays the results of the SMART self-test for 28-bit addressing only.
- **Extended SMART self test log (log type 7)**: Displays the results of the SMART self-test for 48-bit and 28-bit addressing.

Usage: **msecli -S [-l <log-type[0 | 1 | 2 | 3 | 6 | 7]>] [-n <device-name>] [-r] [-s <out-file-name>]**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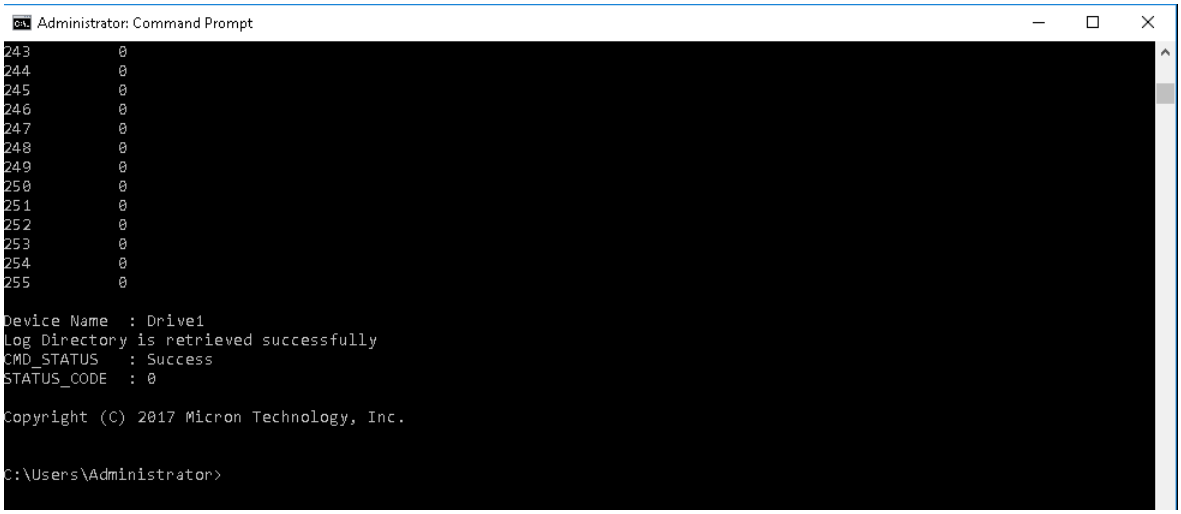
## Displaying a SMART Error Log Directory

1. Enter the following at the command prompt: **msecli -S -l 0 -n <device-name>** Replace **<device-name>** with the drive's device name.
2. The SMART error log directory displays.

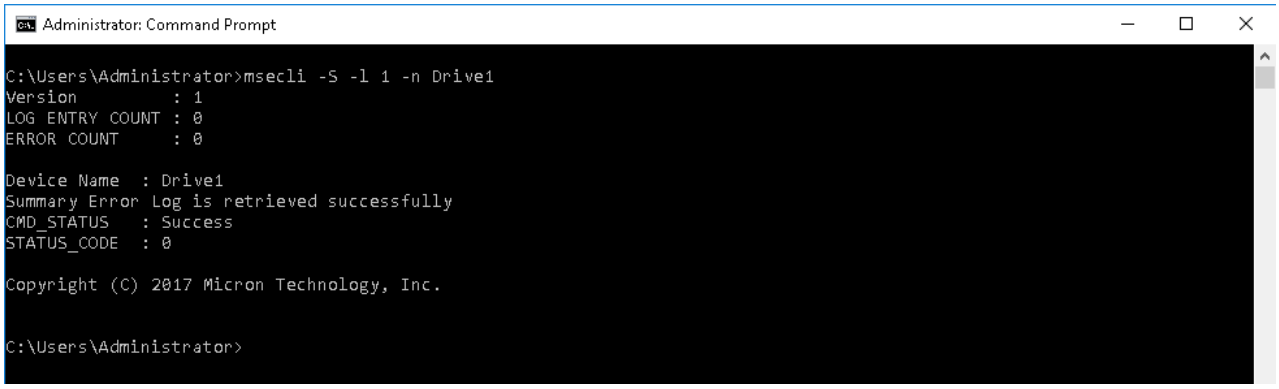
**Figure 15: SMART Error Log Directory**




## Displaying a SMART Summary Error Log

1. Enter the following at the command prompt: **msecli -S -l 1 -n <device-name>** Replace **<device-name>** with the drive's device name.
2. The SMART summary error log displays.

**Figure 16: SMART Summary Error Log**





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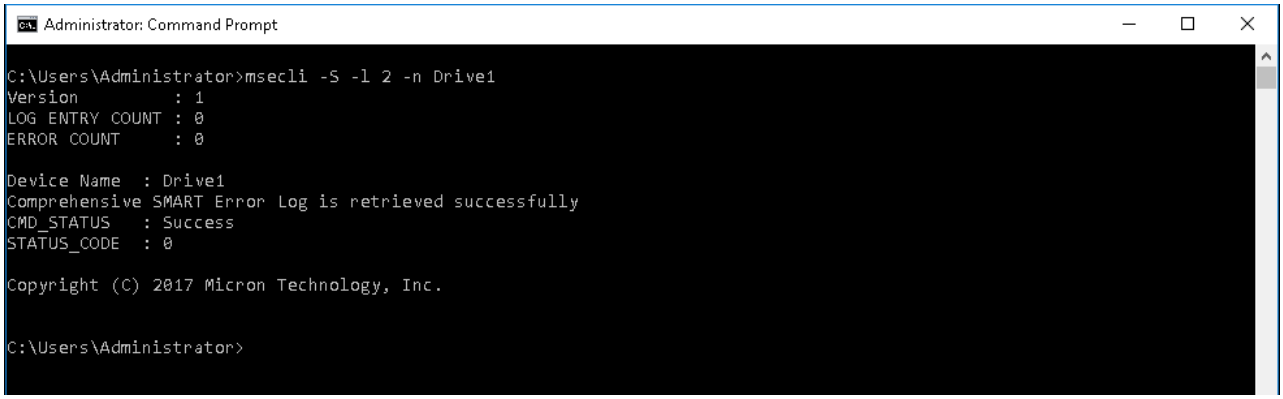
## Displaying a SMART Comprehensive Error Log

1. Enter the following at the command prompt: **msecli -S -l 2 -n <device-name>** Replace **<device-name>** with the drive's device name.
2. The SMART comprehensive error log displays.

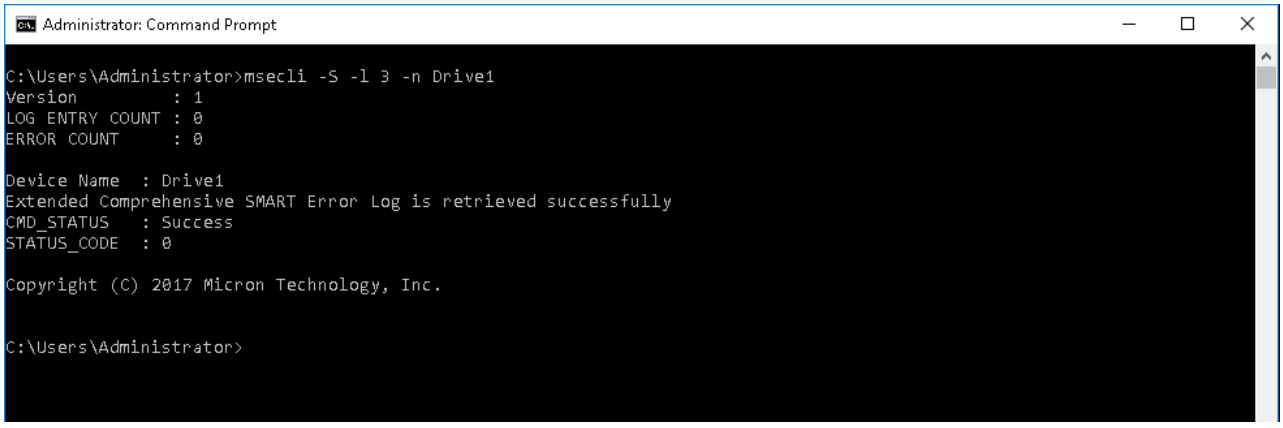
**Figure 17: SMART Comprehensive Error Log**




## Displaying a SMART Extended Error Log

1. Enter the following at the command prompt: **msecli -S -l 3 -n <device-name>** Replace **<device-name>** with the drive's device name.
2. The SMART extended error log displays.

**Figure 18: SMART Extended Error Log**





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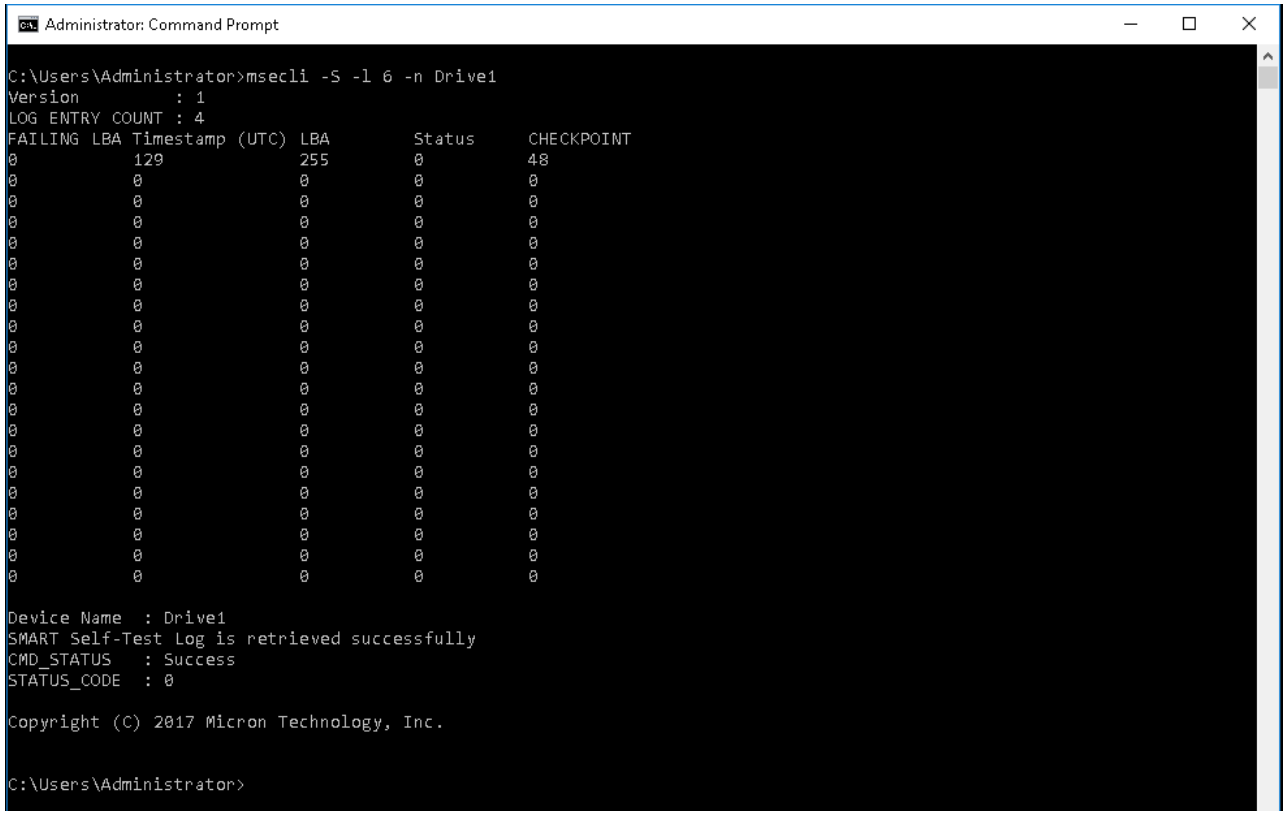
## Displaying a SMART Self Test Log

1. Enter the following at the command prompt: **msecli -S -l 6 -n <device-name>** Replace **<device-name>** with the drive's device name.
2. The SMART self test log displays.

**Figure 19: SMART Self Test Log**





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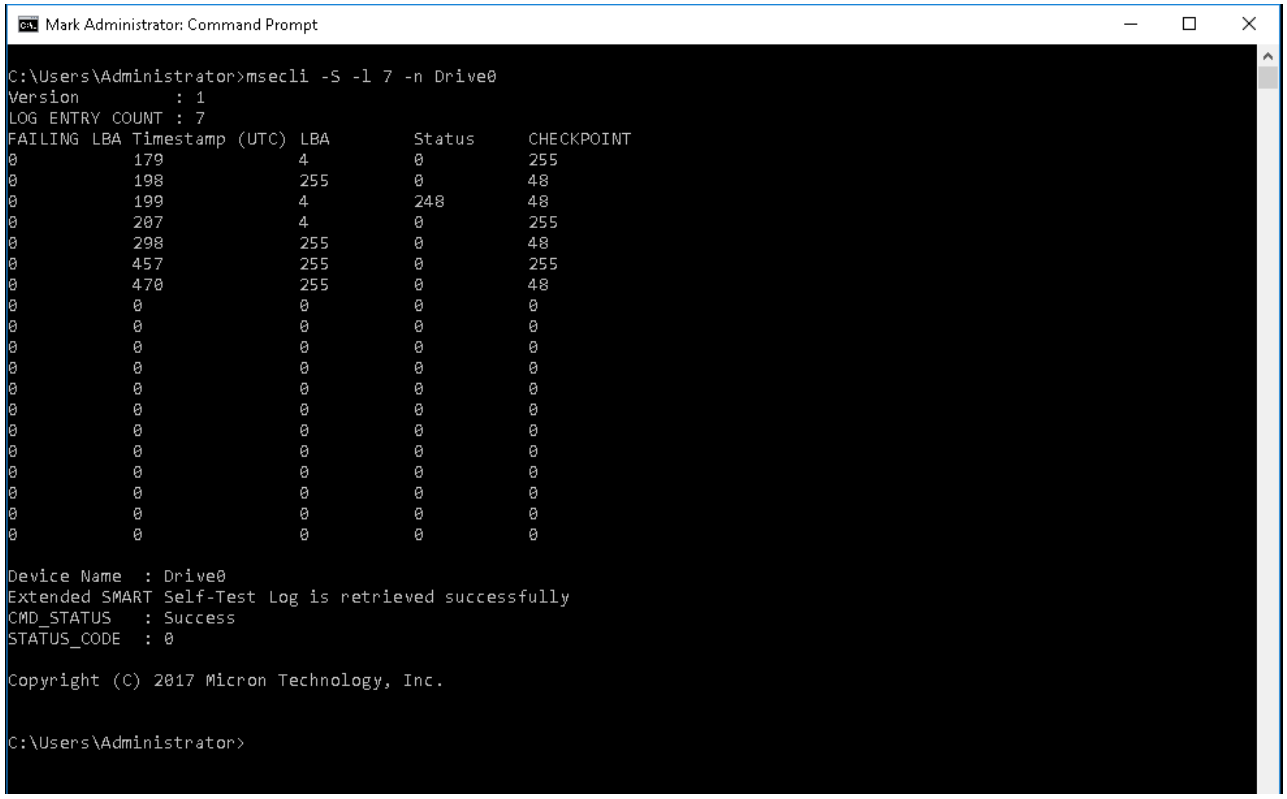
## Displaying a SMART Extended Self Test Log

1. Enter the following at the command prompt: **msecli -S -l 7 -n <device-name>** Replace **<device-name>** with the drive's device name.
2. The SMART extended self test log displays.

**Figure 20: SMART Extended Self Test Log**





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# Running SMART Self Tests

Use the following instructions to run SMART self tests on a specific drive. The supported tests (Short, Extended, Conveyance Self Test) can be run in either offline or captive mode.

**Note:** This feature is not supported by NVMe drives. With SAS drives, only Self Test types 1 and 2 are supported.

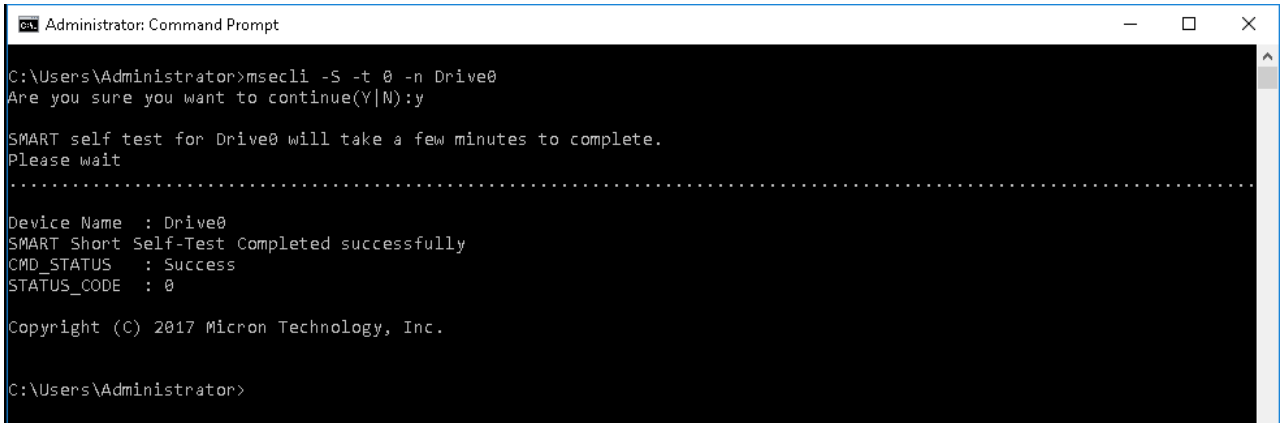
Usage: **msecli -S -t <self-test type> -n <device-name>**

Where **self-test type** is an integer:

- 0 = Short Self Test offline mode
- 1 = Extended Self Test offline mode
- 2 = Conveyance Self Test offline mode
- 3 = Short Self Test captive mode
- 4 = Extended Self Test captive mode
- 5 = Conveyance Self Test captive mode

1. Enter the following at the command prompt:
   **msecli -S -t <self-test type> -n <device-name>**
2. Enter **Y** when prompted.
3. The self test can take up to an hour depending on the test being run (Extended Self Test is the longest). A message appears when the test is complete.

**Figure 21: Running SMART Self Test**





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# Updating Firmware

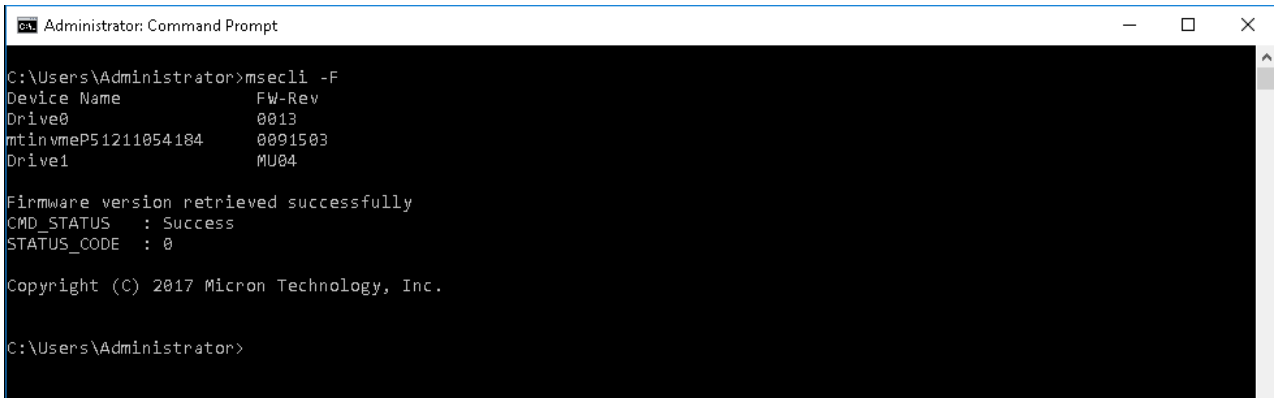
This section explains how to check for and perform a firmware update on supported drives.

## Checking the Firmware Version

Usage: **msecli -F**

1. Enter the following at the command prompt: **msecli -F**
2. The currently installed firmware version displays.

**Figure 22: Firmware Version**




## Updating Firmware

Usage: **msecli -U -i <fw-folder-path> -S <firmware-slot> -n <device-name> [-r] [-s <out-filename>]**

**Note:** Specify **-m <model-number>** instead of **-n <device-name>** to upgrade the firmware on all drives of the same model type. For NVMe drives, specify the firmware slot using the -S su-option.

1. Enter the following at the command prompt: **msecli -U -i <fw-folder-path> -n <device-name>**
   Replace **<fw-folder-path>** with the firmware folder for the drive.
2. Confirm the operation when prompted.
3. Press **Enter** to continue.

   On Windows systems, the CLI boots into Tiny Core Linux (TCL) and updates the firmware. A message indicates the progress and shows successful when complete. The system will boot into Windows again automatically.

   On Linux systems, a message appears when the upgrade is successful.


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**Figure 23: Firmware Update Successful**

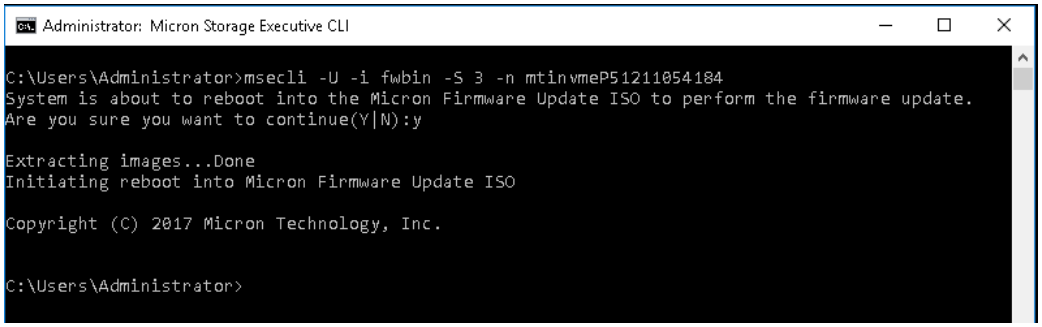
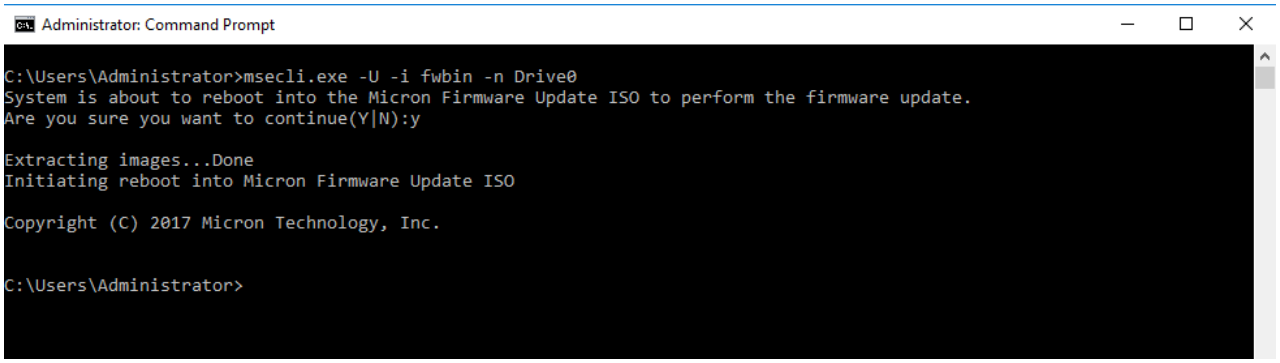



**Figure 24: Firmware Update Successful**




## Downloading a Single Firmware Image

This option downloads a raw firmware binary image to the specified Micron drive.

The optional **-S <fw-slot>** can be used to specify a firmware slot on an NVMe drive. If **-S** is not specified for an NVMe drive, the slot will be chosen automatically.

Usage: **msecli -F [-U <firmware binary image>] [-S <fw-slot>] [-r] -n <devicename>**

1. Enter the following at the command prompt: **msecli -F -U <firmware binary image> -n <devicename>**
2. Confirm the operation when prompted.

   A message indicates the firmware image update is in progress. When finished, a message indicates the operation was successful.


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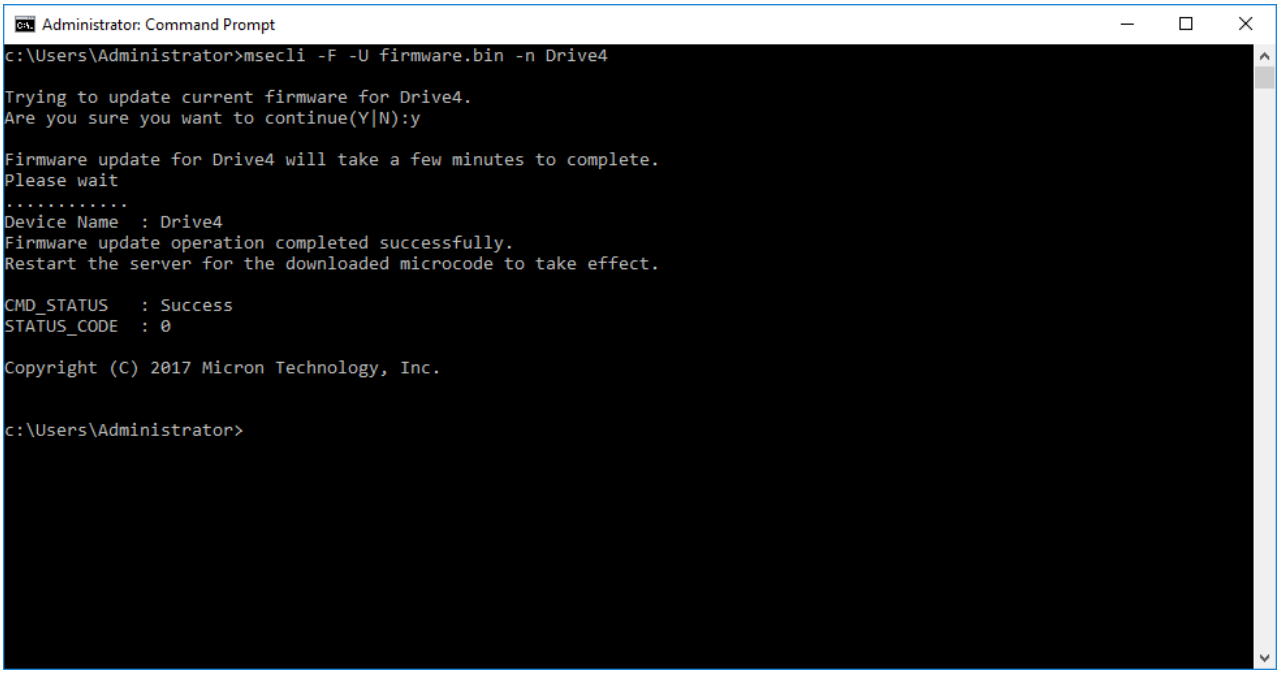
**Figure 25: Firmware Update**





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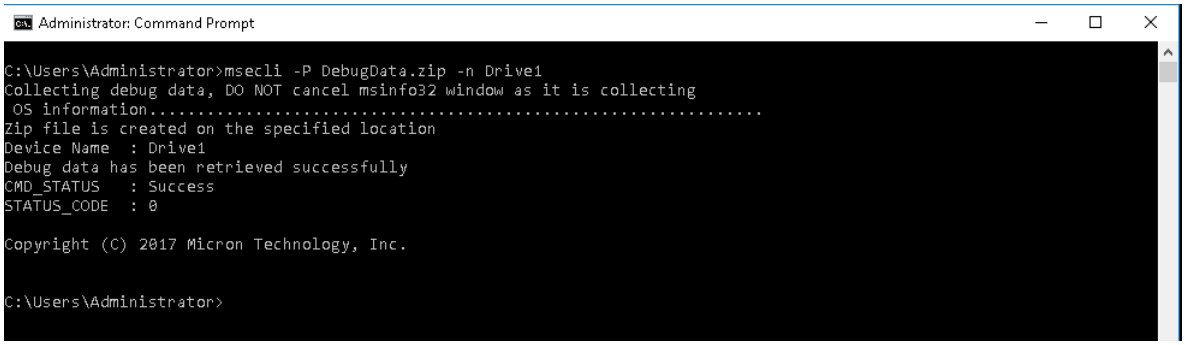
# Retrieving Debug Data

Debug data from the device and operating system is provided to help debug any potential issues. If using VMware, debug data is saved as a .tar file. Otherwise, debug data is saved as a .zip file.

Usage: **msecli -P <.zip or .tar file name> -n <device-name>** [**-r**] [**-s <out-filename>**]

1. Enter the following at the command prompt: **msecli –P <.zip or .tar file name> -n <device-name>**
   Replace **<.zip or .tar file name>** with the debug data file and **<device-name>** with the drive's device name. If a file path is not specified, the .zip or .tar file is saved to the current directory.
2. A message appears when the operation completes.

**Figure 26: Zip File Created Successfully**





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# Erasing a Drive

This section explains how to remove all data from a drive by performing a sanitize erase, sanitize crypto scramble, PSID revert, or secure erase operation.

## Performing a Sanitize Drive (Block Erase) Operation

The sanitize drive (block erase) operation is supported on all drives except for encrypted drives (those with TCG-enabled/password-protected). These drives must use the PSID revert operation to remove data. See Performing a PSID Revert (SATA and SAS Drives Only) (page 30).

This operation:

- Cannot be performed on mounted drives. Unmount the drive before proceeding.
- Cannot be performed on Windows systems in which the system partition is encrypted with Bitlocker.
- Will not complete on systems in IDE mode. Change to AHCI mode and then proceed with the operation.
- Cannot be performed on drives connected behind a RAID controller.

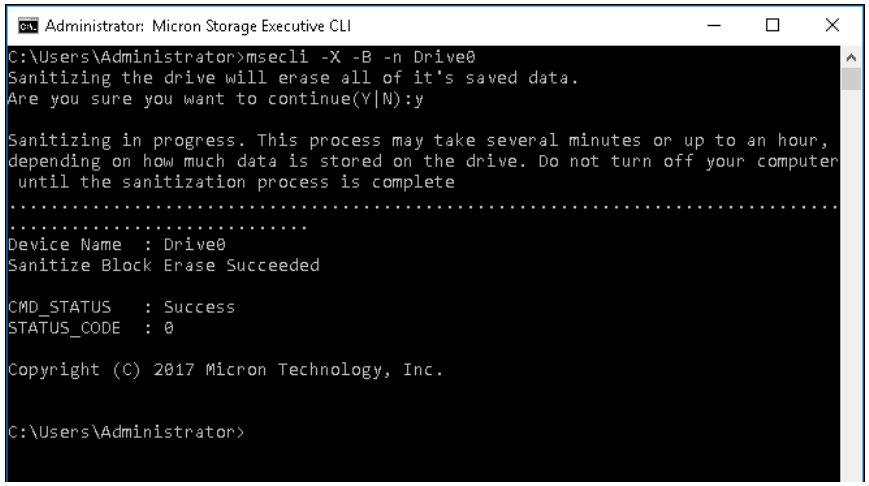
**CAUTION:** This operation completely removes all data from a drive. If possible, back up important data before performing the operation.

Usage: **msecli -X -B -n <device-name>** [**-r**] [**-s <out-filename>**]

1. Enter the following at the command prompt: **msecli -X -B -n <device-name>**
2. Confirm the operation when prompted.
3. Press **Enter** to continue.

   A message indicates the operation is in progress. When finished, a message indicates the operation was successful.

**Figure 27: Sanitize Drive Successful**





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## Performing a Sanitize Crypto Scramble Operation (SATA Drives Only)

This operation is not supported on encrypted drives (those with TCG-enabled/password-protected) and the BX100, BX200 and P400m drives. Encrypted drives must use the PSID revert operation to remove data. BX100, BX200 and P400m drives must use the Sanitize Block Erase operation to remove data.

This operation:

- Cannot be performed on mounted drives. Unmount the drive before proceeding.
- Cannot be performed on Windows systems in which the system partition is encrypted with Bitlocker.
- Will not complete on systems in IDE mode. Change to AHCI mode and then proceed with the operation.
- Cannot be performed on drives connected behind a RAID controller.

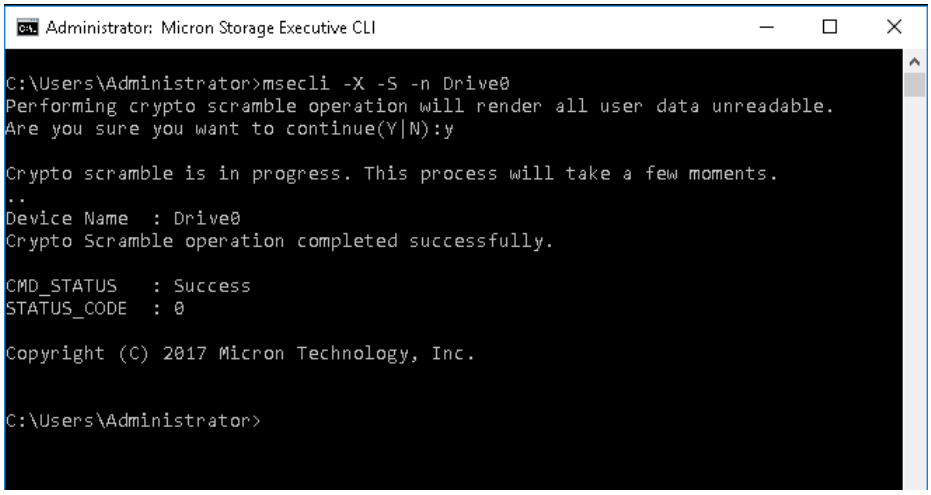
**CAUTION:** This operation completely removes all data from the drive. If possible, back up important data before performing the operation.

Usage: **msecli -X -S -n <device-name>** [**-r**] [**-s <output-filename>**]

1. Enter the following at the command prompt: **msecli -X -S -n <device-name>**
2. Confirm the operation when prompted.
3. Press **Enter** to continue.

   A message indicates the operation is in progress. Another appears when the operation is successful.

**Figure 28: Sanitize Crypto Scramble Successful**





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## Performing a PSID Revert (SATA and SAS Drives Only)

This operation is supported on encrypted SATA and SAS drives only.

The PSID revert operation removes all data from an encrypted drive (one with TCG enabled/password-protected). It can also be used in the event that you have an encrypted drive for which you have lost the authentication code to return the drive to its factory default state.

TCG is automatically enabled on drives that are initialized in systems running Windows 8 or later, or it can be enabled with third-party software utilities. For more information on TCG, refer to http://www.trustedcomputinggroup.org/.

This operation cannot be performed on mounted drives. Unmount the drive before proceeding.

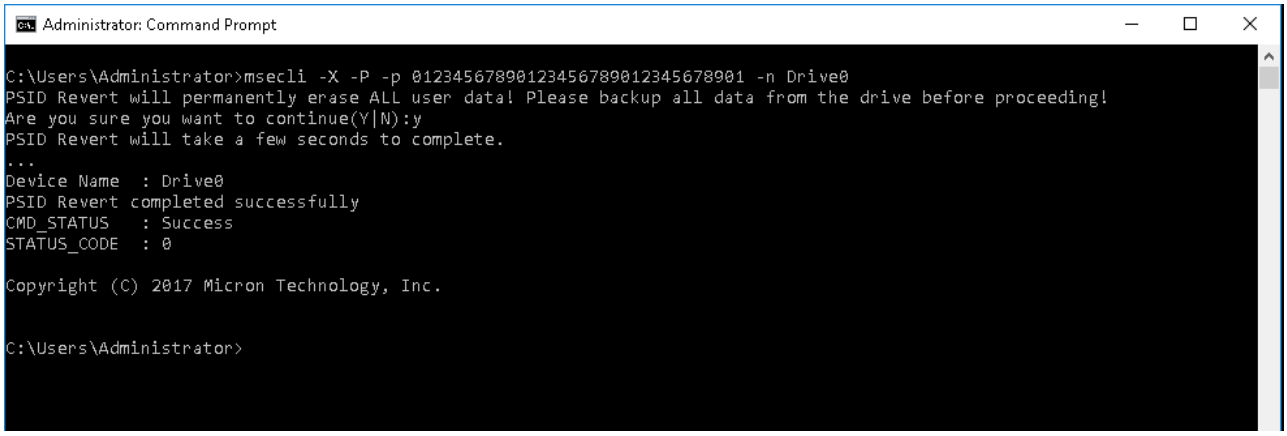
**CAUTION:** A PSID revert operation completely removes all data from the drive and returns the drive to its factory default state. If possible, back up important data before performing the operation.

Usage: **msecli -X -P -p <PSID-value> -n <device-name>** [**-r**] [**-s <output-filename>**]

1. Enter the following at the command prompt: **msecli -X -P -p <PSID-value> -n <device-name>**
   Replace <PSID-value> with the drive's PSID value. This value can be found on the drive's front label.
2. Confirm the operation when prompted.
3. Press **Enter** to continue.

   A message indicates the operation was successful.

**Figure 29: PSID Revert Successful**





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## Performing a Secure Erase

**CAUTION:** This operation completely removes all data from a drive. If possible, back up important data before performing the operation.

This operation cannot be performed on mounted drives. Unmount the drive before proceeding.

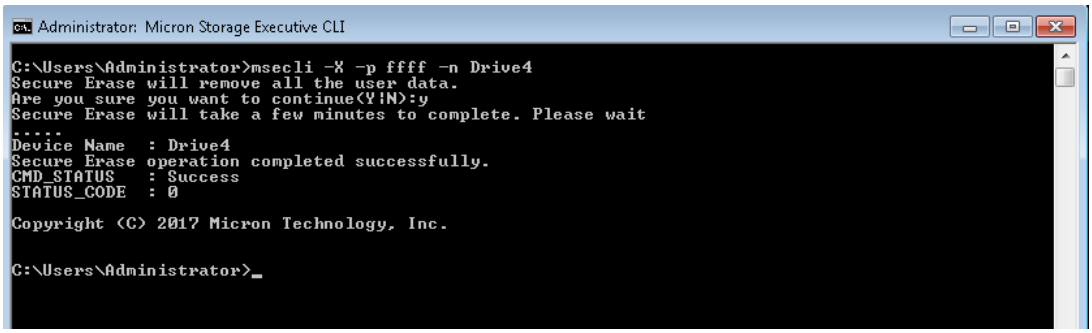
This command is not supported by drives in a security frozen state. For drives in this state, use the Sanitize Drive operation to remove user data.

Usage: **msecli -X -n <device-name> -p <password>** [**-r**] [**-s <out-filename>**]

1. Enter the following at the command prompt: **msecli -X -p <password> -n <device-name>**
   Replace **<password>** with **ffff** and **<device-name>** with the drive's name.
2. Confirm the operation when prompted.
3. Press **Enter** to continue.

   A message indicates the operation is in progress. When finished, a message indicates the operation was successful.

**Figure 30: Secure Erase Successful**





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# Running the STANDBY IMMEDIATE Command

This command places the specified drive in standby mode. This is useful when preparing a drive for removal from a system or prior to shutdown. The drive will remain capable of processing commands but performance may be slower than if the drive were in an idle state.

Usage: **msecli -C -b -n <device-name>**

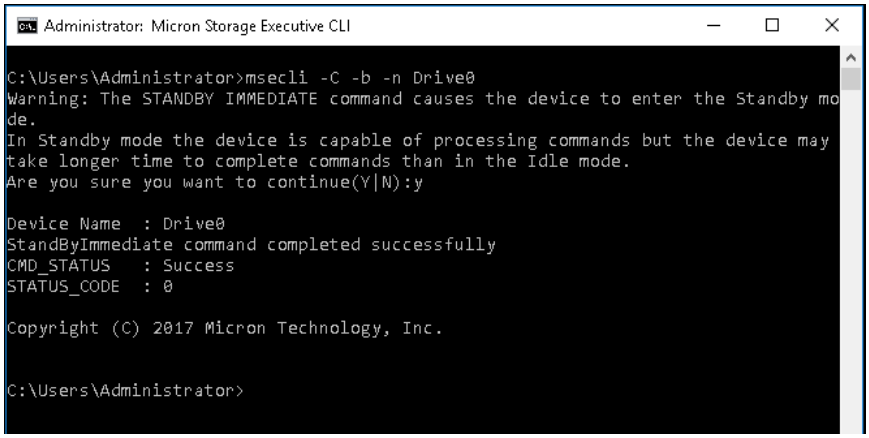
1. Enter the following at the command prompt: **msecli -C -b -n <device-name>**

   Replace **<device-name>** with the drive's name.

2. Enter **Y** when the warning message appears.

   A message indicates the operation was successful.

**Figure 31: STANDBY IMMEDIATE Command**





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# Configuring Drive Over-Provisioning

Over-provisioning reduces the accessible capacity of a drive while allocating more capacity for performing background tasks. The CLI provides two methods of changing over-provisioning capacity: specify the max number of LBAs or set desired drive capacity in GB (whole GB only).

Changing the over-provisioning capacity should only be performed on drives that do not contain user data. Changing the over-provisioning capacity on a drive with user data can result in data loss.

Note: NVMe support is limited to the 9200 Series.

Usage: **msecli -M [-o <Max Address> | -O <Capacity in GB.] [-z] -n <device-name>**

1. Enter the following at the command prompt: **msecli –M –o <Max Address> -O <Capacity in GB> [-z] -n <device-name>**

   If specifying max address, replace **<Max Address>** with the new max addressable LBA , not to exceed the default for the drive.

   **WARNING (not applicable to 5100 Series SSDs):** Setting the max addressable LBA may cause data loss. Back up all required data before performing this operation. Setting the max addressable LBA of the drive without first performing a SANITIZE DRIVE operation may not provide the full performance benefit of over-provisioning. The optional **-z** parameter performs a SANITIZE DRIVE operation prior to changing the over-provisioning capacity.

   The default max LBA can be determined using the following command: **msecli -L -d -n <device name>**.

2. Enter **Y** to proceed with the operation.
3. A message indicates the operation was successful.
4. Power cycle the system for the settings to take effect.


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**Figure 32: Changing Over-Provisioning Capacity via Max Address**

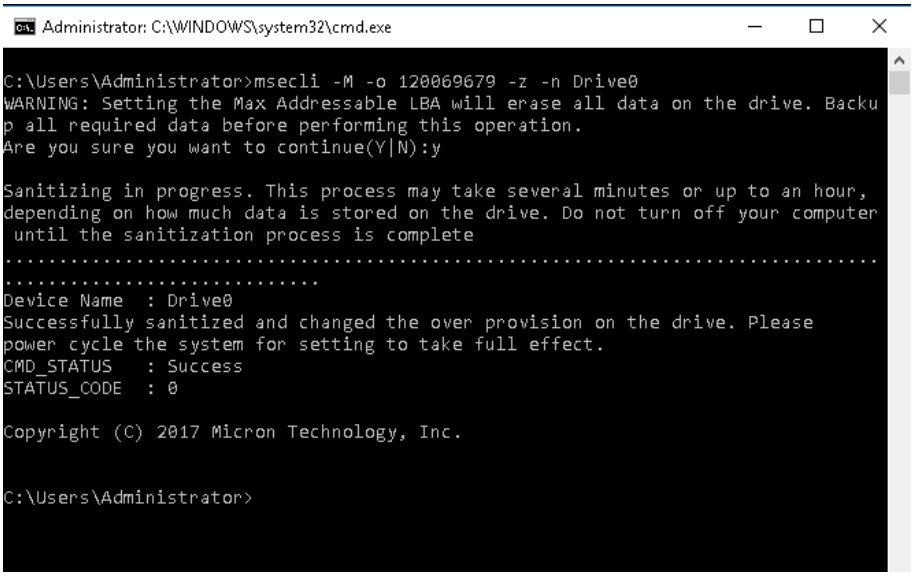
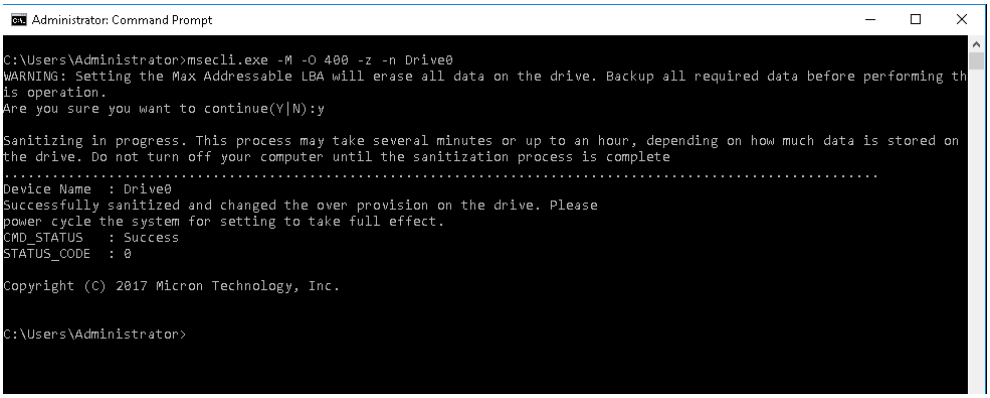



**Figure 33: Changing Over-Provisioning via Drive Capacity**





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# Formatting a Drive (SAS Drives Only)

This section describes how to format a supported SAS drive.

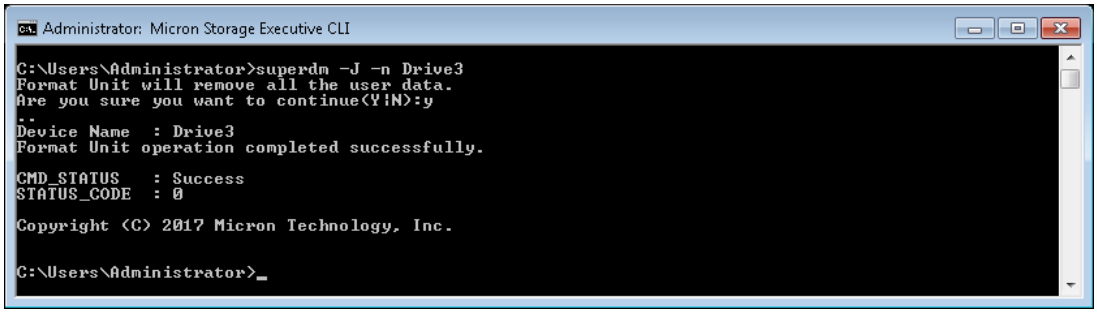
This option can be used to change the LBA size configuration from the default 512 bytes to any other LBA size supported by the drive. Changing LBA data size is not required for this operation to complete. See the product data sheet (available on micron.com) for supported LBA sizes.

**CAUTION**: All data on the drive will be lost when performing this operation.

Usage: **msecli -J** [**-b <Number of Blocks> -l <LBA block size>** ] [ **-p <Protection type>** [ **-e <Protection Interval Exponent>** ]] [ **-d** ] [ **-c** ] [ **-f** ] **-n <device-name>**

1. Enter the following at the command prompt: **msecli -J -n <device-name>**
   Replace **<device-name>** with the name of the drive.
2. Confirm the operation when prompted.
3. Press Enter to continue.
4. A message indicates the operation is in progress. When finished, a message indicates the operation was successful.

**Figure 34: Format Drive Successful**





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# Configuring Interrupt Coalescing (NVMe Drives Only)

Interrupt coalescing is the process of taking successive command completion events and coalescing them into a single interrupt. When a high queue depth is used on an NVMe drive, this coalescing leads to fewer system interrupts, lower CPU utilization, and higher IOPS. For lower queue depth I/O activity, coalescing can increase latency. Changing this value increases or decreases the internal timeout length, enabling more or less I/Os to be completed with a single interrupt.

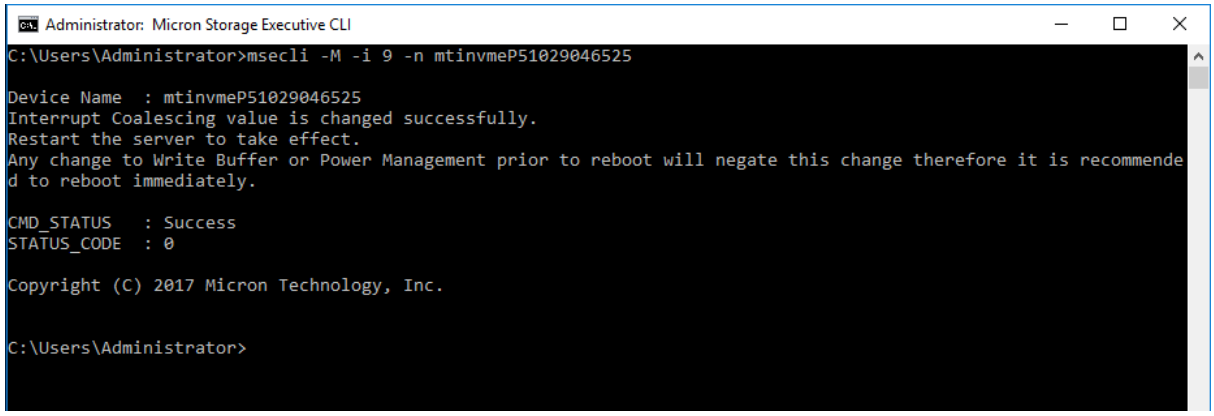
For NVMe drives, valid data values must be in the following hexadecimal format:
Bits 15:8 - Aggregation Time
Bits 7:0 - Aggregation Threshold

Usage: **msecli -M -i <coalescing value> -n <device-name>** [**-r**] [**-s <out-filename>**]

1. Enter the following at the command prompt: **msecli –M –i <coalescing value> -n <device-name>**
   Replace **<coalescing value>** with the new interrupt coalescing value and **<device-name>** with the name of the drive.
2. Confirm the operation when prompted.
3. Press **Enter** to continue.

   A message indicates the operation was successful.

**Figure 35: Interrupt Coalescing Value Changed Successfully**





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# Preparing to Remove a Drive (NVMe Drives Only)

This section describes how to prepare an NVMe drive to be safely removed from a system.

During the removal process, any cached data is automatically flushed to the drive and the driver unregisters the drive from the kernel. The drive can then be safely removed from the system. Users do not have permission to read, write, or monitor the drive after it is logically removed from system.

**Note**: Because of kernel limitations, these instructions are supported on RHEL 6.x, SLES, and Windows platforms only. The instructions are not supported on RHEL 5.x platforms.

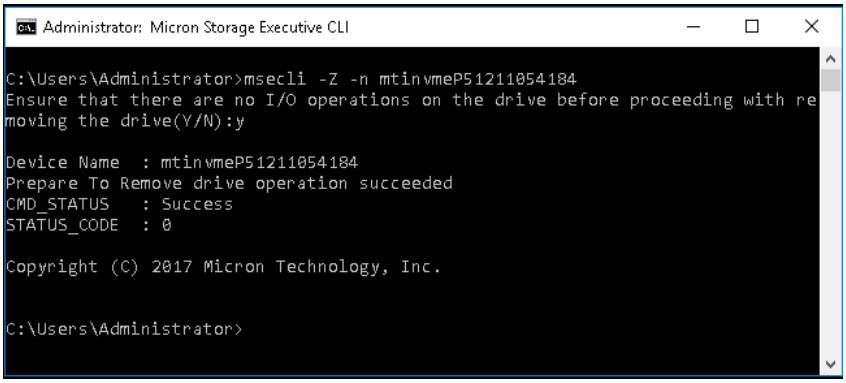
**CAUTION**: Do not perform a remove command when an I/O operation is in progress. Doing so will cause the remaining I/O to fail without any indication.

This operation cannot be performed on mounted drives. Unmount the drive before proceeding.

Usage: **msecli -Z -n <drive-id>** [**-r**] [**-s <out-filename>**]

1. Enter the following at the command prompt: **msecli -Z -n <device-name>** Replace **<device-name>** with the name of the drive.
2. A message indicates the drive was shut down successfully and has been prepared for removal. The drive can now be physically removed from the system.

**Figure 36: Drive Shut Down Successfully**




To use the drive again, restart the system.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# Namespace Management (NVMe Drives Only)

This section explains the options for managing the namespace on an NVMe drive.

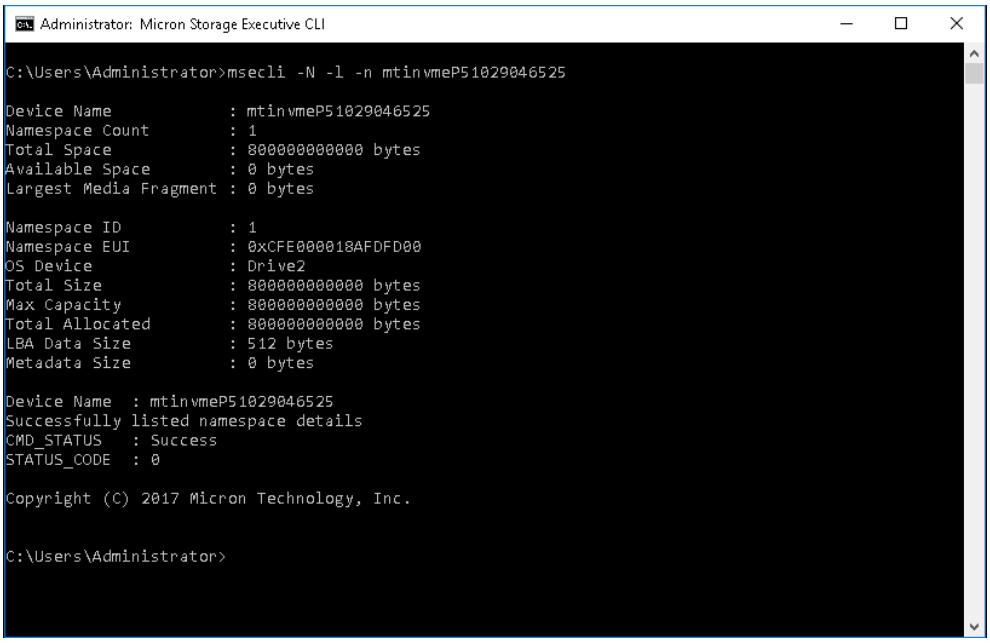
## Displaying Namespace Details

The following option displays details about the namespace on an NVMe drive, including the namespace ID which is used for namespace-specific operations.

Usage: **msecli -N -l -n <device-name>**

1. Enter the following at the command prompt: **msecli -N -l -n <device-name>**
2. Namespace details for the specified NVMe drive appear.

**Figure 37: Display Namespace Details Command**




## Displaying LBA Formats for a Namespace

NVMe namespaces can support several different LBA formats (512 byte vs. 4096 byte). The following command displays the supported LBA formats for a given namespace.

Usage: **msecli -N -f <namespace-ID> -n <device-name>**

1. Enter the following at the command prompt: **msecli -N -f <namespace-ID> -n <device-name>**
2. LBA formats for the specified namespace appear.


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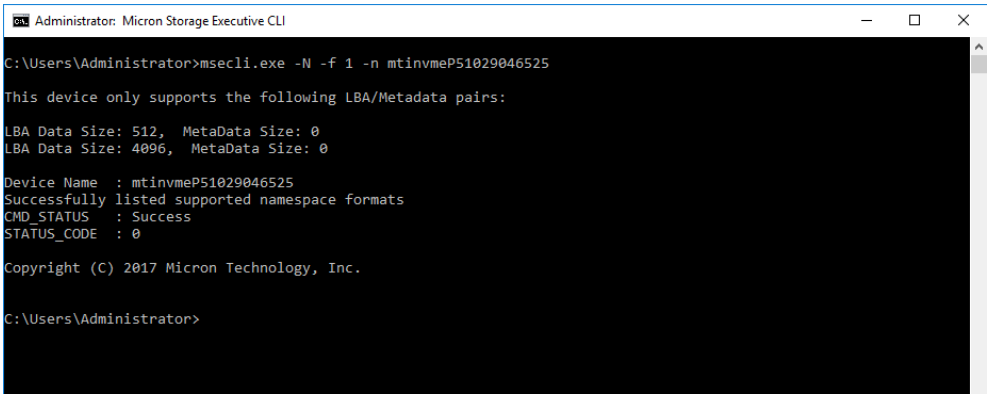
**Figure 38: Display LBA Formats for a Namespace**




## Changing LBA Format on a Namespace

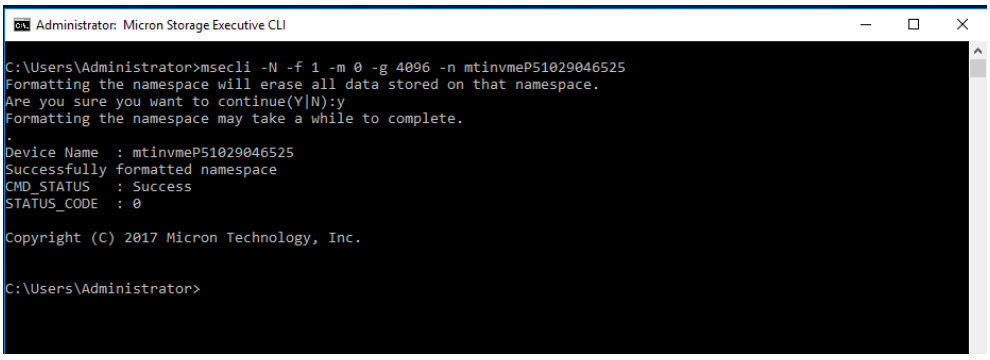
The following command changes the LBA format of a specified namespace. This can be used to change the LBA or metadata size of the namespace.

**WARNING:** This command causes all data on the namespace to be erased. Backup any data before proceeding. If you want to perform a secure erase as part of the format, see the Secure Erase Namespace section below. Make sure to offline/unmount the namespace OS device before attempting this operation.

Usage: **msecli -N -f <namespace-ID> -m <metadata size> -g <LBA size> -n <device-name>**

1. Enter the following at the command prompt: **msecli -N -f <namespace-ID> -m <metadata size> -g <LBA size> -n <device-name>**
2. When prompted, enter **Y** to proceed with the format.
3. The operation begins and may take up to a few minutes to complete.
4. After the operation completes, the namespace format is changed.

**Figure 39: Changing LBA Formats on a Namespace**





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## Secure Erase Namespace

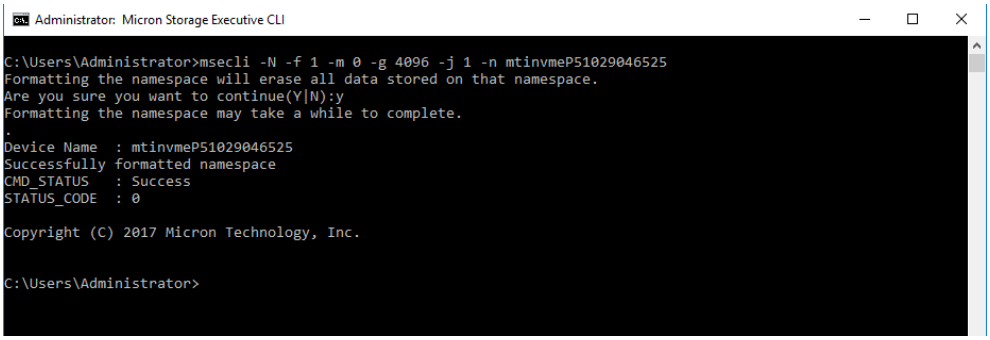
The section above covers changing the LBA format on a given namespace, which causes user data to be erased. This same command can be used to perform a secure erase or cryptographic erase (where supported) on the namespace. You do not need to change LBA format to perform a secure erase, simply set the metadata and LBA size to the current settings.

**WARNING:** A secure erase operation removes all user data on the namespace. Backup data before proceeding. Make sure to offline/unmount the namespace OS device before attempting this operation.

Usage: **msecli -N -f <namespace-ID> -m <metadata size> -g <LBA size> -j [ 1 (Secure Erase) | 2 (Cryptographic Erase)] -n <device-name>**

1. Enter the following at the command prompt: **msecli -N -f <namespace-ID> -m <metadata size> -g <LBA size> -j [ 1 | 2 ] -n <device-name>**
2. When prompted, enter **Y** to proceed with the secure erase operation.
3. The operation begins and may take up to a few minutes to complete.

**Figure 40: Secure Erase Namespace**





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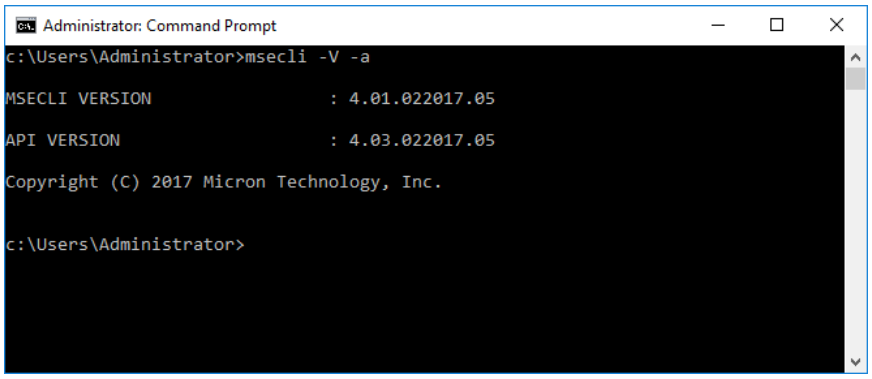
# Displaying Storage Executive, API, and CLI Versions

Use the following instructions to display the installed version of Storage Executive, the API, and the CLI.

Usage: **msecli -V -a** [**-s <out-filename>**]

1. Enter the following at the command prompt: **msecli -V -a**
2. The currently installed version numbers display .

**Figure 41: Storage Executive, API, and CLI Versions**





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# Appendix A. SMART Attributes and Drive Statistics

This section lists standard SMART attributes, attribute IDs, and drive statistics supported by drive interface. For a customer-specific list of SMART attribute details, contact your Micron customer representative.

## SATA Drives

**Table 1: SMART IDs and Attributes—SATA Drives**

| ID | SMART Attribute Name |
|---|---|
| 1 | Raw Read Error Rate |
| 5 | Retired NAND Blocks |
| 9 | Power On Hours Count |
| 12 | Power Cycle Count |
| 171 | Program Fail Count |
| 172 | Erase Fail Count |
| 173 | Average Block-Erase Count |
| 174 | Unexpected Power Loss Count |
| 180 | Unused Reserved Block Count |
| 183 | SATA Interface Downshift |
| 184 | Error Correction Count |
| 187 | Reported Uncorrectable Errors |
| 194 | Enclosure Temperature |
| 196 | Reallocation Event Count |
| 197 | Current Pending Sector Count |
| 198 | SMART Off-Line Scan Uncorrectable Errors |
| 199 | Ultra-DMA CRC Error Count |
| 202 | Percentage Lifetime Used |
| 206 | Write Error Rate |
| 210 | RAIN Successful Recovery Page Count |
| 246 | Cumulative Host Write Sector Count |
| 247 | Host Program Page Count |
| 248 | FTL Program Page Count |


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## SAS Drives

SAS drives do not natively support SMART. For these drives, Storage Executive pulls pertinent drive statistics from various sense log pages.

**Table 2: Drive Statistics—SAS Drives**

| Name |
|---|
| Current Temperature |
| Highest Lifetime Temperature |
| Power Cycle Count |
| Percent Lifetime Used |
| Negotiated Logical Link Rate (Gbps) |
| Power on Hours Count |


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# Revision History

## Rev. B – 10/17

- Added support for 9200 Series
- Updated Configuring Drive Over-Provisioning section

## Rev. A – 3/17

- Initial release

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