Solidigm™ CLI Storage Tool

User Guide

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SOLIDIGM™

Revision History

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020	3.2	• Updated SMART feature in Features Section • Update Show SMART in Show Device Information section • Updated OCP(formerly NVME) Error Injection in Show Device Information section • Added OCP Latency Monitor section to Configure SSDs section • Updated copyright to Solidigm Inc.	Oct. 2026

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1 Introduction

This guide describes usability of the Command Line Interface (CLI) of Solidigm™ Storage Tool (SST) and provides reference on using the tool to configure and retrieve data from supported products.

SST Summary:

- CLI based tool for interacting with Solidigm™ SSDs (formerly Intel®)
- Provides firmware updates to all non-OEM drives
- Supports Client and Datacenter drives
- Supports multiple Operating Systems: Windows, Linux and ESXi

1.1 Features

The SST provides a suite of capabilities for interacting with PCIe/SATA-based SSDs.

1.1.1 Feature Availability

Availability of features is dependent on various factors. These factors include, but are not limited to, the following:

- Product
- Product Type: Client, Datacenter
- Interface Type: ATA, NVMe (1.1, 1.2, 1.3, 1.4)
- Operating System Version/Support
- Driver: Intel NVMe driver, Windows Inbox NVMe driver, Intel® RST driver
- Configuration: RAID

1.1.2 Feature Summary

The functionality includes:

- Detecting drives attached on the system
- Parsing a drive's Identify Device information
- Parsing a drive's SMART (Self-Monitoring and Reporting Technology) information
- Resizing the SSD's usable storage capacity by changing its max LBA
- Option to retrieve output in text, JSON or xml format
- Updating SSD firmware:
  - Firmware binaries for updating the firmware are embedded in the tool.
  - When displaying drive information, the tool will indicate if a new firmware is available.
- Calculating drive life expectancy (Endurance Analyzer)
- Power Governor Mode (vendor unique). Three modes are supported:
  - 0: 25-watts for PCIe NVMe devices; 40W for PCIe NVMe x8 devices; Unconstrained for SATA devices.
  - 1: 20-watts for PCIe NVMe devices; 35W for PCIe NVMe x8 devices; Typical (7-watts) for SATA devices.
  - 2: 10-watts for PCIe NVMe devices; 25W for PCIe NVMe x8 devices; Low (5-watts) for SATA devices.
- Functionality to Enable/Disable Latency Tracking
- Functionality to Parse the read and write commands from Latency Tracking logs
- End of Life notification when 15% of spare is left

The following functionality and features apply to SATA drives only:

- Enabling and disabling Spread Spectrum Clocking (SSC)

- Issuing SCT Error Recover Control command
- Setting drive PHY Speed: 1.5Gbs, 3.0Gbs, and 6.0Gbs
- Setting PHY configurations:
    - 0 (Default Enterprise Settings)
    - 1 (Client Settings)
    - 2 (Alternate Enterprise Settings)

Support for SCT Feature Control:

- Write cache state
- Write cache reordering state
- Temperature logging interval
- PLI Cap test time interval (vendor unique)
- Power Governor Burst power (vendor unique)
- Power Governor Average power (vendor unique)
    - Parse ATA HDA Temp (SCT command)
    - Parsing PHY Counters (ATA command)
    - Reading ATA General Purpose Logs (GPL) (generic)
    - ATA Standby Immediate
    - ATA Drive Self-Test

The following functionality applies to PCIe NVMe drives only:

- Executing an NVMe Format command
- Parsing device log data
- Reading and setting temperature threshold
- Dumping NLOGS and Event Logs
- Reading and setting the SM Bus Address
- Namespace Management command support (NVMe 1.2 and later drives)

1.2 System Requirements

The SST is supported on the following:

- Operating systems on x64 Architecture:
    - Windows:
        - Windows Server 2016, 2019, 2022, 2025
        - Windows 10, 11
    - Linux:
        - Red Hat Enterprise Linux (RHEL) 8.0, 8.2, 8.3, 8.4
        - CentOS 8.0, 8.2, 8.3, 8.4
        - SLES 12, 15
        - Ubuntu 16.04, 18.04, 20.04, 22.04, 24.04
    - ESXi:
        - Unsigned VIB
            - ESXi 7.x
            - ESXi 8.0, 8.0.u1, 8.0 u2, 8.0.u3, 9.0, 9.1
        - Signed Component
            - ESXi 8.0.u2, 8.0.u3, 9.0, 9.1
    - Available space of 400 MBs

Note:

- On Windows Server and Windows OS, administrator access is required. Open a command prompt as administrator and run the tool via the commands as described in this document. Disable UAC where applicable and run the tool in a command prompt.
- On Linux systems, the tool must be run with root privileges. This can be done through either sudo or su commands. If running as a non-root user, the tool will not be able to communicate with the drive. Only basic drive information will be displayed, and no drive functions will work. There are two Linux installers: one for 32-bit systems, and one for 64-bit systems.
- On ESXi systems, due to driver limitations, SATA is not supported, only PCIe NVMe drives using the ESXi NVMe driver. The user may need to set their ESXi host acceptance level to "CommunitySupported" in order to install the tool.
- Namespace limitations on RHEL/Centos 8.2: Kernel bug can cause deadlock on delete namespace in RHEL/CentOS 8.2
- Earlier OS Versions not listed in supported list are generally expected to work but are not actively validated and not officially supported

1.2.1 RAID Support

Supported:

- The Intel® RST RAID supports direct attached SSD SATA drives only.
- Drives attached to LSI MegaRAID adaptors
  - SATA drives
  - NVMe drives
  - **Note:** It is recommended to update RAID cards firmware to the latest version available from Broadcom
  - Supported Broadcom cards:
    - 9500 Series - Support based on latest 7.x storelib version
    - 9600 Series - Support based on latest 8.x storelib version

Not Supported:

- RAID is not supported on ESXi
- Drives behind HBAs

RAID Modes Supported:

- RAID 0
- RAID 1
- RAID 5
- VROC RAID

Other Modes Supported:

- AHCI

1.3 Document Conventions

Throughout this guide, the format of each command is documented in a gray colored text box.

- Items in [brackets] are optional.
- For options and targets, each possible value is separated by a bar, '|', meaning "or" and the default value is listed first.
- Items in (parenthesis) indicate a user supplied value.

For example, the following **set** command is interpreted as follows:

- The verb **set** can be followed by an optional modifier (help).
- The target --ssd is required followed by Index or Serial number of the drive to be targeted
- It also specifies a required property Test in which valid values are Test1 or Test2.

```
sst set [-h|--help] --ssd [(Index|SerialNumber|PhysicalPath)] --Test (Test1|Test2)
```

1.4 Running the SST

Run the SST from either a Windows administrator command prompt or a Linux terminal window. The tool is run as a single command by supplying the command and parameters immediately following the SST executable.

```
sst show --ssd
```

1.5 Command Syntax

The command line syntax is case insensitive and is interpreted in English-only. It follows CLI11 Command Line Protocol.

First argument is action type (command) such as show, set, start

Then options such as --output, --help,

Target: Drive target such as --ssd index

Primary Action usually is feature or command name from the spec

Secondary Action may be need for feature that may have secondary action

Generally, the form of a user request is:

```
sst <command> <options> --target --<primaryaction> --<secondyaction>
```

Options generally have a short and long form (for example, -a|-all). One or more targets are normally required to indicate the object of the action. However, there are a few cases where a target is not required.

1.6 New Syntax and Legacy Support

Starting with SST 3.0, SST now supports an industry standard command line syntax and help.

Legacy syntax is still supported but will be removed in an upcoming version. Solidigm recommends transition to the new syntax.

Highlight of changes:

- Usage of double hyphens `"--"`instead of single hyphen `"-"` for command names
- Removal of equal signs`"="`between the command name and value. Separated by space now.
- New configuration setting to support Legacy syntax
- Help. See Help section (link below)
  - Syntax to get help
  - Commands categorized based on tasks

Legacy Support options:

A new configuration setting, LegacySyntaxSupport, has been added to allow a smooth transition to the new syntax

By default, a warning message appears when a legacy command is used.

Users can also turn off the warnings or support for legacy syntax.

Options:

- Yes : Support legacy syntax (previous SST versions with no warnings).
- No : Do not support legacy syntax (legacy syntax will result in error).
- Warn : Support legacy syntax with warnings (execute the command but display a warning).
- Example: `sst set --system --LegacySyntaxSupport Yes`

Table 1: Examples of some syntax changes:

Legacy Sytnax	New Syntax
`sst show -ssd`	`sst show --ssd`
`sst show -system`	`sst show --system`
`sst show -smart -ssd`	`sst show --smart --ssd`
`sst help name=setled`	`sst set --help --ledActivity`
`sst set -ssd 1 -AsyncEventConfig FirmwareActivationNoticesConfiguration=false`	`sst set --ssd 1 --AsyncEventConfig --FirmwareActivationNoticesConfiguration false`

1.7 Targets

In general, if there is only one object of a specific target type, a target value is not accepted.

Unless otherwise specified, when there are multiple objects of a specific target type, not supplying a target value implies the command should operate on all targets of that type. This is the case for the show device command, which will display all devices if no target value is specified.

```
sst show --ssd
```

The same operation can be limited to a single object by supplying a specific target value.

Suggestion: Targeting by index is convenient but index may change after some commands so Serial Number target is recommended for destructive commands and scripts/automation.

```
sst show --ssd 1
sst show --ssd SERIALNUMBER
```

2 Tool Support Commands

General tool related commands consisting of the following:

- Tool version
- Tool license
- Tool settings
- Tool Help

2.1 Version Command

Shows the version of the tool, plugins loaded and End-User License.

Syntax

```
sst version [--help|-h] [--display|-d] [-a-ll|-a] [--output|-o (text|nvmxml|json)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--display|-d]	Filters the returned properties by explicitly specifying a comma separated list of any of the properties defined in the Return Data section.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

This command does not support any targets.

Properties

This command does not support any properties.

Return Data

By default, the command returns the SST's version information. With the –display option, it shows the License property.

Property	Description
License	Shows the End-User License for the SST.

Sample Output

Default output in text.

```
> sst version
- Version Information -

Name: Solidigm(R) Storage Tool
Version: 3.0.0
```

```
Description: Interact and configure SSDs.
```

Default output in JSON.

```
> sst version –o json
{
        "Version Information":
        {
                "Name":"Solidigm(R) Storage Tool",
                "Version":"3.0.0",
                "Description":"Interact and configure SSDs."
        }
}
```

Examples

Display the available version information for the SST.

```
sst version
```

Display the End-User License for the SST software components.

```
sst version –d license
```

2.2 Tool Configuration Settings

SST has system settings to set configurations

Table 2: Configuration Settings:

Setting	Description
EnableLog	Enable SST log. It captures SST command details
LogFile	Path and name of log file
LegacySyntaxSupport	Legacy syntax support • YES = Support Legacy syntax • WARN = Support Legacy syntax but display warning • NO = Do not support. Give error if legacy syntax is provided.
EnableRAIDCardSupport	Enable or Disable RAID Card support **Note:** Windows and Linux only

Show Configuration settings:

`sst show --system`

Output:

```
sst show --system

EnableLog: true
LogFile: SolidigmStorageTool.log
LegacySyntaxSupport: YES
```

```
EnableRAIDCardSupport: false
```

Set Configuration settings:

```
Usage: sst set [--help, -h] --system [--EnableLog {true|false}] [--LogFile <file>] [--LegacySyntaxSup-
port {Yes|No|Warn}] [--EnableRAIDCardSupport {true|false}] [--output, -o {text|json}]

options:
  [--help, -h]                      Print this help message and exit
  --system                          System configuration target
  [--EnableLog]                     Enable/Disable logging ({true|false})
  [--LogFile]                       Set log file path (<file>)
  [--LegacySyntaxSupport]           Legacy syntax support ({Yes|No|Warn})
  [--EnableRAIDCardSupport]         Enable/Disable RAIDCardSupport ({true|false})
  [--output, -o]                    Output format ({text|json})
```

Examples:

```
sst set --system --EnableLog true

sst set --system --EnableLog true --LogFile SSTLog.txt

sst set --system --EnableRAIDCardSupport true
```

2.3 Help Command

Note: Starting from SST 3.0, command line interface was changed to follow industry standard. Mostly use of "–" instead of "-". CLI provided major changes and improvements to Help. Help is now layered and properly categorized.

There are multiple ways to get help.

Type	Syntax	Description
General	`sst` `sst --help`	General help to list all commands and quick description
Detailed General Help	`sst --help -v`	Verbose option. List of all commands and full syntax
Help based on task	`sst <command> --help`	List commands that are related to the task such as show or set `eg. sst set --help`
Help based on task (verbose)	`sst <command> --help -v`	List commands with full syntax that are related to the task such as show or set `eg. sst set --help -v`

Detailed Help on specific command	`sst set --help --PrimaryAction` `sst show --help --PrimaryAction`	List full syntax of command (primary action) `eg. sst set --help --LEDActivity`
Layered Help on specific command	`sst set --help --primaraction --secondaryaction`	Get layered help for commands that have multiple actions. `eg. sst set --help --writecache --writecachestate`

Syntax

```
sst help [--help|-h] [--output|-o (text|nvmxml|json)] [--Name (command)]
```

Options

Option	Description
[-help|-h]	Displays help for the command.
[-output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Return Data

By default, the command displays an introduction to SST followed by a list of the supported commands. When the command list can be filtered to just one command, detailed information is displayed. When the command list includes more than one command, only the command name and synopsis are displayed.

Categories:	**Description:**
Tool Info & Settings	Commands related to Tools Settings and Version
Device List & SMART	Command to list drives and Show SMART
Identify	Commands to list Identify data
Generic Commands	General commands that are universal. Such as get log, get feature
Firmware Administration	All Firmware related commands such as Firmware Update
Diagnostics, Logs, and Telemetry	Commands related to debugging drives, getting drive logs and Telemetry
Namespace and Capacity Management	Commands related to Namespace and drive Capacity Management

Data - Erase, Format, and Media Operations	Commands related to Data manipulation **Warning:** Use Caution. Commands may be destructive and cause permanent data loss.
Device Commands and Features	Commands related to devices commands and features based on specs

Sample Output (Multiple Commands)

Note: Not all commands are displayed. This is just to view how the output appears.

```
>sst.exe --help

Solidigm Storage Tool

Command-Line Interface (CLI) provides access to drive information, health,
SMART Attributes, Firmware Updates, diagnostic scans, and secure erase.

Tool Info & Settings:
   version                  Show tool version information.
   set     --system         Set SST system properties
   show    --system         Show SST configuration settings


Device List & SMART:
   show   --smart            Show SMART attributes for the selected device.
   show   --ssd              Show a list of Solidigm SSDs attached to the system.


Identify:
   dump   --identify         Dump the identify I/O command set data structure (CNS 1Ch) for the
 selected device.
   dump   --identify         Dump the identify UUID list for the selected device.
   dump   --identify         Dump the identify controller data structure for the selected device.
   dump   --identify         Dump the identify namespace granularity list for the selected device.
   dump   --identify         Dump the list of controllers for the selected device.
   show   --identify         Show the identify I/O command set data structure (CNS 1Ch) for the
 selected device.
   show   --identify         Show the identify UUID list for the selected device.
   show   --identify         Show the identify controller data structure for the selected device.
   show   --identify         Show the identify namespace granularity list for the selected device.
   show   --identify         Show the list of controllers for the selected device.


Generic Commands:
   show   --getfeature       Show the attributes of the specified NVMe feature.
   dump   --nvmelog          Dump an NVMe log page to a file.
   show   --nvmelog          Show an NVMe log page.
```

```
   set    --setfeature        Set the attribute of the specified NVMe feature.


Firmware Administration:
   set    --AsyncEventConfig     Enable or disable firmware activation notice async events for the
 selected NVMe device.
   load   --firmwareactivate     Activate firmware that has already been downloaded to the selected
 device.
   set    --OCPClearFirmwareUpdateHistory  Clear the firmware update history on the selected NVMe
 device.
   load   --ssd                  Update the firmware on the selected device.


Diagnostics, Logs, and Telemetry:
   dump   --assertlog            Read the assert log binary data from the device and save it to a binary
 file.
   set    --AsyncEventConfig     Configure the SMART health critical warnings async event configuration
 for the selected NVMe device.
   dump   --bridgenlog           Read the bridge NLog binary data from the device and save it to a
 binary file.
   dump   --debuglogs            Collects debug logs and creates ZIP package
   reset  --enduranceanalyzer    Reset the timed workload indicators used to calculate the EnduranceAna-
lyzer property.
   show   --enduranceanalyzer    Show the endurance analyzer status for the selected device.
   dump   --eventlog             Read the event log binary data from the device and save it to a binary
 file.
   update --ir                   Update existing IR zip file with new source file
   dump   --nlog                 Read the NLog binary data from the device and save it to a binary file.
   show   --performance          Show performance metric properties for the selected device.
   show   --performancebooster   Show the current performance booster progress for the selected device.
   start  --performancebooster   Request the selected device to start the performance booster.
   stop   --performancebooster   Request the selected device to stop the performance booster.
   dump   --persistenteventlog   Read the persistent event log binary data from the device and save it
 to a binary file.
   show   --persistenteventlog   Parse and display the contents of a persistent event log.
   start  --scan                 Run a health scan on the selected device.
   show   --selftest             Show the status of the most recently run self-test on the selected
 device.
   start  --selftest             Run a self-test on the selected device.
   stop   --selftest             Stop the currently running self-test on the selected device.
   show   --sensor               Show health sensor properties for the selected device.
   dump   --telemetrylog         Read telemetry binary data from the selected device and save it to a
 file.
   set    --WorkloadTracker      Enable or disable the workload tracker feature on the selected NVMe
 device.
   set    --WorkloadTracker      Set the workload tracker control value directly for the selected NVMe
 device.
   dump   --WorkloadTrackerLog   Dump the workload tracker log for a specified duration in CSV format.
```

```
   set    --WorkloadTrackerThreshold       Set the workload tracker threshold percentage for the
 selected NVMe device.


Namespace and Capacity Management:
   set    --AsyncEventConfig       Enable or disable namespace attribute notice async events for the
 selected NVMe device.
   dump   --identify               Dump identify namespace data for the selected device.
   dump   --identify               Dump the identify namespace list for the selected device.
   dump   --identify               Dump the namespace identification descriptor list for the selected
 device.
   show   --identify               Show identify namespace data for the selected device.
   show   --identify               Show the identify namespace list for the selected device.
   show   --identify               Show the namespace identification descriptor list for the selected
 device.
   attach --namespace              Attach a namespace to an NVMe controller.
   create --namespace              Create a namespace on the selected device.
   delete --namespace              Delete a namespace from the selected device.
   detach --namespace              Detach a namespace from an NVMe controller.
   show   --partition              Show partition information for the selected device.
   set    --ssd                    Set the maximum logical block address (LBA) for the selected device.


Data - Erase, Format, and Media Operations:
   set    --ieee1667               Enable eDrive support on the selected device.
   reset  --nvmecontroller         Send an NVMe Reset command to the selected device.
   start  --nvmeformat             Issue an NVMe Format NVM command to the selected device.
   set    --OCPIEEE1667Silo        Enable or disable the IEEE 1667 Silo feature on the selected NVMe
 device.
   start  --psidrevert             Issue a PSID revert to an Opal-activated device.
   start  --sanitize               Issue an NVMe Sanitize command to the selected device.
   start  --secureerase            Execute an ATA Secure Erase on the selected device.
   delete --ssd                    Delete all user data on the selected device.
   start  --trim                   Trim sectors on the selected device.
   start  --writesame              Issue an ATA Write Same command to the selected device.


Device Features:
   set    --AsyncEventConfig          Enable or disable telemetry log notice async events for the
 selected NVMe device.
   show   --backgroundprocessing      Show the background processing status for the selected device.
   set    --dipm                       Enable or disable the device-initiated power management (DIPM)
 feature on the selected SATA device.
   set    --errorrecoverycontrol       Set the read error recovery control timer for the selected SATA
 device.
   set    --errorrecoverycontrol       Set the write error recovery control timer for the selected SATA
 device.
   set    --fdp                         Enable or disable the Flexible Data Placement (FDP) feature for
 the selected NVMe device.
```

```
  set    --fdpevents                    Enable or disable FDP events on the selected NVMe device for a
 specified placement handle.
  dump   --gpl                          Read the general purpose log from the device and save it to a
 binary file.
  show   --hdatemperature               Show HDA temperature data for the selected SATA device, includ-
ing temperature history.
  set    --hmc                          Enable or disable the host memory cache (HMC) feature on the
 selected device.
  set    --HostBehaviorSupport          Set the host behavior support feature fields for the selected
 NVMe device.
  set    --InterruptCoalescing          Set the interrupt coalescing aggregation threshold for the
 selected device.
  set    --InterruptCoalescing          Set the interrupt coalescing aggregation time for the selected
 device.
  show   --latencystatistics            Show latency tracking statistics for reads or writes.
  set    --latencytracking              Enable or disable the latency tracking feature on the selected
 device.
  set    --LEDActivity                  Set LED blink behavior for the selected device.
  set    --ncqsupport                   Enable or disable the NCQ support bit in the identify data for
 the selected SATA device.
  set    --OCPClearPCIeCorrectable      Clear the PCIe correctable error counter on the selected NVMe
 device.
  set    --OCPDSSDAsyncEventConfiguration Set the OCP DSSD asynchronous event configuration for the
 selected device.
  set    --OCPDSSDPowerState            Set the DSSD power state for the selected device, specified in
 watts.
set    --OCPErrorInjection              Send the Error Injection Set Feature command using a list of
 error injection entries.
  set    --OCPLatencyMonitor            Set the latency monitor feature.
  set    --OCPPLPCheck                  Set the PLP health check frequency interval for the selected
 device.
  set    --OCPReadOnlyWriteMode         Set the device's mode [read-only | write-through] when it
 reaches End-of-Life(EOL) or if Power Loss Protection(PLP) fails.
  set    --OCPTelemetryProfile          Set the OCP telemetry profile for the selected device.
  set    --pgm                     Set the power governor mode for the selected device.
  set    --phy                     Set the PHY configuration for the selected SATA device.
  set    --phy                     Set the PHY speed for the selected SATA device.
  show   --phycounters             Show the PHY counters log page for the selected SATA device.set
 --sct_control         Set the PLI test time interval for the selected SATA device.
  set    --sct_control             Set the physical sector size for the selected SATA device.
  set    --sct_control             Set the temperature logging interval for the selected SATA device.
  show   --sct_control             Show the current PLI test time interval for the selected SATA
 device.
  set    --SMBus                   Set the SM Bus address for the selected NVMe device.
  set    --ssc                     Enable or disable the spread spectrum clocking (SSC) feature on the
 selected device.
  start  --standby                 Issue an ATA Standby Immediate command to the selected device.
  dump   --SystemSnapshot          Read the system snapshot from the selected device and save it to a
 file.
```

```
  set    --TempThreshold          Set the temperature threshold for the selected NVMe device.
  set    --Timestamp              Set the timestamp on the selected NVMe device.
  set    --writecache             Enable or disable the write cache on the selected SATA device.
  set    --writecache             Enable or disable write cache reordering on the selected SATA
 device.
  set    --writecache             Set the write cache state for the selected SATA device.


Run : sst <command> --help --<primaryaction> for command help
```

Sample Output (Single Command)

Specifying the Name property filters the list to a specific command and detailed information is returned.

```
sudo sst set --help --TempThreshold



--TempThreshold        Set the temperature threshold for the selected NVMe device.
---------------
Usage: sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath --
TempThreshold --tempCelcius value

options:
  [--help, -h]       Display help for the command.
  [--output, -o]     Change the output format. One of "text", "nvmxml" or "json". (text|nvmxml|json)
  --ssd              Device index or serial number or physical path is required. (Index|SerialNum-
ber|PhysicalPath)
  --TempThreshold    Set the TempThreshold for the drive.
  --tempCelcius      Temperature threshold in degrees Celsius. Maximum value is 80. (value)
```

Layered Help

- `sst command --help --primaryaction`
- `sst command --help --primaryaction --secondaryaction`

```
>sst set --help --WriteCache

set:

  Usage: sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath [--
writecache] --WriteCacheEnabled 'true'|'false'

  Usage: sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath [--
writecache] --WriteCacheReorderingStateEnabled 'true'|'false'

  Usage: sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath [--
writecache] --WriteCacheState 1|2|3
```

```
>sst set --help --WriteCache --WriteCacheState

Usage: sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath [--
writecache] --WriteCacheState 1|2|3

options:
  [--help, -h]              Display help for the command.
  [--output, -o]            Change the output format. One of "text", "nvmxml" or "json". (text|nvmxml|
json)
  --ssd                     Device index or serial number or physical path is required. (Index|Serial-
Number|PhysicalPath)
  [--writecache]            Set the SATA device's write cache.
  --WriteCacheState         1 = Write cache state is determined by the Set Features command. 2 = Write
 cache is enabled. 3 = Write cache is disabled. (1|2|3)
```

Examples

Lists all supported commands.

```
sst --help
```

Lists all commands where the verb is set.

```
sst set --help
```

Lists the detailed help for the given Name WriteCacheState.

```
sst set --help --WriteCache
sst set --help --WriteCache --WriteEacheEnabled
```

3 Feature List

The following table list all features available in SST. Features are listed alphabetically. Command Syntax describes the command and command syntax needed to perform each feature. Commands can have different options and ways to specify target drive.

Further details for each command is provided in subsequent sections of this document.

3.1 Quick Command Syntax Guide for Features Table

Options	Description
[--all|-a]	Shows all properties.
[--display|-d]	Filters the returned properties by explicitly specifying a comma separated list of any of the properties defined in the Return Data section.
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Target	Description
--ssd [(Index| SerialNumber |PhysicalPath |Bootdrive)]	Restricts output to specific SSD by supplying the device's Index or Serial Number or path or Bootdrive. BootDrive option available in Windows only.

3.2 Features

Feature	Description	Command Syntax	Example

Aggregation (Threshold/ Time)	Set the Aggregation Threshold/Time	`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --InterruptCoalescing --aggregationthreshold (value)`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --InterruptCoalescing --aggregationtime (value)`
			`sst set --ssd 1 --InterruptCoalescing --aggregationthreshold 128`
			
			`sst set --ssd 1 --InterruptCoalescing --aggregationtime 255`

Feature	Description	Command Syntax	Example
Assert Log	Read the Assert Log binary and save it to the given file-name. NVME only	`dump [--help|-h] [--destination (path)] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] -assertlog`	`sst dump --destination assertlog_binary.bin --ssd 1 --assertlog`
Bridge NLog	Read the Bridge NLog binary and save it to the given file-name. Selected NVME only	`dump [--help|-h] [--destination (path)] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] -bridgenlog`	`sst dump --destination apl_bridge_binary.bin --ssd 1 --bridgenlog`

Debug Logs	Dump debugging logs from the drive and create zip package
	Selected drives only
		`dump [--help|-h] --debuglogs [-v] [--destination (path)] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] [-type (all|list|identify|nvmelogs|system|telemetry)]`
		
		-v : Verbose mode: Show detailed command output on screen
		Default log type is 'all'
		Use "-type list" to get list of logs
			`sst dump -debuglogs --ssd 1`
			
			`sst dump --debuglogs -v --ssd 1`
			
			`sst dump --debuglogs -v --ssd 1 -type nvmelogs`

Delete	Delete all the data on the selected device. To by-pass the prompt, specify the -force option.	`delete [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath)`	`sst delete --ssd 1`

DIPM	Disable/Enable drive's DIPM feature.
	
	ATA only
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --dipmenabled ('true' | 'false')`	`sst set --ssd 1 --dipmenabled false`
			
			`sst set --ssd 1 --dipmenabled true`

Feature	Description	Command Syntax	Example
Drive Index	Display information of selec-trive by index.	`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`	`sst show --ssd 1`
Drive List	Display a list of attached drives to the screen.	`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`	`sst show --ssd`
Drive Path	Display information of selected drive by drive path.	`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`	`sst show --ssd \\.\physicaldrive1`
Drive Serial	Display information of selected drive by serial number.	`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`	`sst show --ssd cvpo893749287gn`
Drive Scan	Scan the drive for Data Integrity, Read Scans, or Logs.	`start [--help|-h] [--output|-o (text|nvmxml|json)] --scan [(dataintegrity|readscan|logs)] [--ssd [(Index|SerialNumber|PhysicalPath)]] [--includeos (true|false)] [--fullscan (true|false)] [--path (drive letter)] [--directorypath (file path)] [--includesysteminfo (true|false)]`	`sst start --scan logs --ssd 1`

Feature	Description	Command Syntax	Example

DSSD PowerState	Show, set DSSD Power state	`sst set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) -OCPDSSDPowerState --DSSDPowerState (Watts)`
		
		`sst show [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --getFeature OCPDSSDPowerState`
			`sst set --ssd 1 --OCPDSSDPowerState DSSDPowerState=20`
			
			`sst show --ssd 1 --getFeature OCPDSSDPowerState`

eDrive (Set)	Enable eDrive support on the device. Warning: once enabled, eDrive support cannot be disabled. Selected drives only	`set [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) edrivesupported = (true)`	`sst set --ssd 1 --edrivesupported true`
Endurance Analyzer	Run the endurance analyzer calculation to determine drives life expectancy.	`reset [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --enduranceanalyzer`	`sst reset --ssd 1 --enduranceanalyzer`
Error Injection(OCP)	Inject panic error into an OCP enabled drive.	`sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath --OCPErrorInjection [--ErrorInjectionEntries (tilde-separated entry list)] [--File path to input file]`	`sst set –ssd 1 --OCPErorinjection --errorInjectionEntries 1|0|5|2~0|0|9|a5`

Feature	Description	Command Syntax	Example

Error Recovery Timer (Read/Write)	Set the selected drive's current error read and write recovery timers.
	
	ATA only
		`show [--help|-h] [--display|-d (propoerty1, …)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath)`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --writeerrorrecoverytimer (0-65535)`
			`sst show -d readerror-recoverytimer --ssd 1`
			
			`sst show -d writeerror-recoverytimer --ssd 1`
			
			`sst set --ssd 1 --reader-rorrecoverytimer 2`
			
			`sst set --ssd 1 --writeerrorrecoverytimer 5`

Event Log	Read the Event Log binary and save it to the given filename.	`dump [--help|-h] [--destination (path)] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|Physical-Path)]] --eventlog`	`sst dump --destination eventlog_binary.bin --ssd 1 --eventlog`

Firmware Activate and Configuration	Activate the firmware on the selected drive (NVMe only).
	Configure activation notification
	Performed after firmware update with source option
	
	NVMe only
		`load [--help|-h] [--force|-f] [--source (path)] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --firmwareactivate [--firmwareslot ('1|2|3|4|5|6|7')] [--commitaction (2|3)]`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|Physical-Path) --AsyncEventConfig --firmwareactivationnoticesconfiguration ('true' | 'false')`
			`sst load --ssd 1 --firmwareactivate --firmwareslot 1 --commitaction 2`
			
			`sst set --ssd 1 --AsyncEventConfig --firmwareactivationnoticesconfiguration true`

Feature	Description	Command Syntax	Example

Firmware Update (load)	Update the firmware of the selected drive (if possible).	`load –-ssd (Index|SerialNumber|PhysicalPath)`
		
		`load [--help|-h] [--force|-f] [--source (path)] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) [--firmwareslot ('1|2|3|4|5|6|7')] [--commitaction (0|1|2|3)]`
			`sst load --ssd 1`
			
			`sst load --source firmwarebinaryfile.bin --ssd 1 --firmwareslot 1 --commitaction 0`

Format	NVMe Format the selected drive. NVMe only. See NVMeFormat	see nvme format	
General Purpose Log (GPL)	Read the general purpose log binary and save it to the given filename. ATA only	`dump [--help|-h] [--destination (path)] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] --gpl (log address) [--pagenum [(page #)]] [--sectorcount [(sectors)]]`	`sst dump --destination supportedgpl.bin --ssd 1 --gpl 0 --pagenum 0 --sectorcount 1`

Get Feature	Display the given NVMe feature data to the screen.	`show [--help|-h] [--display| -o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)] -getfeature (feature name)`
		
		To list Feature IDs and Names:
		
		`sst show --ssd [(Index|SerialNumber|PhysicalPath)] --getfeature list`
			`sst show --ssd 1 --getfeature list`
			
			`sst show --ssd 1 --getfeature --OCPReadOnlyWriteMode`

HDA Temperature	Display selected drive's HDA Temperature data. ATA only	`show [--help|-h] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)] --hdatemperature`	`sst show --ssd 1 --hdatemperature`

Feature	Description	Command Syntax	Example

Health (sensor/warning)	Show properties related to device health sensors. Enable Health Critical Warnings.	`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] --sensor`
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --AsyncEventConfig --smarthealthcriticalwarningsconfiguration (0-255)`
			`sst show --ssd 1 --sensor`
			
			`sst set --ssd 1 --AsyncEventConfig --smarthealthcriticalwarningsconfiguration 255`

Help	Display the help string and exit. All other arguments will be ignored.	`<command> --help|-h --primaryaction [--secondaryaction]`	`sst set --help --timestamp`
			
			`set --help --writecache --WriteCacheEnabled`

Feature	Description	Command Syntax	Example
Identify	Show the device identify structures. Options: • Namespace • IOCommandSet • UUIDList • NVME Controller • NS Granularity • namespacelist • ControllerList • Descriptors	sst show [--help, -h] [--output, -o text|nvmxml|json|csv] [--ssd Index|SerialNumber|PhysicalPath] --identify --namespace namespace id sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify --iocommandset sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify --uuidlist sst show [--help, -h] [--output, -o text|nvmxml|json|csv] [--ssd Index|SerialNumber|PhysicalPath] --identify --nvmecontroller sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify --ns_granularity sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify --namespacelist 'attached' | 'allocated' | 'IOAllocated' [--csi csi id] sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify --controllerlist [--namespace namespace id] sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify --descriptors	sst show --ssd 1 --identify --nvmecontroller sst show --ssd 1 --identify --namespace 1 sst show --ssd 1 --identify --namespacelist attached sst show --ssd 1 --identify --namespacelist allocated

Feature	Description	Command Syntax	Example

Latency Tracking	Display the Latency tracking status.
	
	Enable or disable the device's Latency Tracking feature.
	
	Selected drives only
		`show [--help|-h] [--output|-o (text|nvmxml|json)] --latencystatistics ('reads'|'writes') [--ssd [(Index|SerialNumber|PhysicalPath)]]`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --latencytrackingenabled= (true|false)`
			`sst show --ssd 1 --latencystatistics reads`
			
			`sst show --ssd 1 --latencystatistics writes`
			
			`sst set --ssd 1 --latencytrackingenabled true`

LED Activity	Display the selected drive's LED activity settings.
	
	Selected drives only
		`show [--help|-h] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] --getFeature LEDActivity`
		`sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath --LEDActivity [--IdleState on|off] [--DurationBase 25|50] [--FormatOnMultiplier 0-15] [--FormatOffMultiplier 0-15] [--IoOffMultiplier 0-15] [--IoOnMultiplier 0-15]`
			`sst show --ssd 1 -getFeature LEDActivity`
			
			`sst set --ssd 1 --ledactivity --idlestate on`
			
			`sst set --ssd 1 --ledactivity --durationbase 25`
			`sst set --ssd 1 --ledactivity --formatonmultiplier 5`
			
			`sst set --ssd 1 ---ledactivity --formatoffmultiplier 5`
			
			`sst set --ssd 1 --ledactivity --ioonmultiplier 5`

License	Display the tool's software license.	`version [--all|-a] [--display|-d (property1,...)] [--help|-h] [--output|-o (text|nvmxml|json)]`	`sst version -d license`

Feature	Description	Command Syntax	Example

Max Address	Set the drive's maximum LBA value.
	
	Caution: Resizes the drive
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|Physical-Path) --maxaddress --maximumlba (numgb|1-100%|lba|'native')`	`sst set --ssd 1 --maxaddress --maximumlba native`
			
			`sst set --ssd 1 --maxaddress --maximumlba 50gb`
			
			`sst set --ssd 1 --maxaddress --maximumlba 25%`
			
			`sst set --ssd 1 --maxaddress --maximumlba 4097151`

Feature	Description	Command Syntax	Example
Namespace (Attach/Create Delete/Detach Notification)	Configure the specified namespace ID to the given controller ID. NVMe only	attach [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --namespace (namespace id) [--nvmecontroller (controller id integer)] create [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --namespace --size (blocks) [--lbaformat = (0-numlbaformats)] [--protectioninformation (0|1)] [--multipathiocapabilities (0|1)] delete [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --namespace (namespace id) detach [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --namespace (namespace id) set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --AsyncEventConfig --namespaceattributenoticesconfiguration ('true' | 'false')	sst attach --ssd 1 --namespace 1 --nvmecontroller 0 sst create --ssd 1 --namespace --size 12345 lbaformat 0 -protectioninformation 1 multipathiocapabilities 1 sst delete --ssd 1 --namespace 1 sst detach --ssd 1 --namespace 1 sst set --ssd 1 --AsyncEventConfig --namespaceattributenoticesconfiguration true
NCQ Support (Enable/Disable)	Set the NCQ bit in the identify block Limitation: ATA DC S3500 (WL_HD) & S3700 (TV) only command	set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --ncqsupport --IsEnabled (true|false)	sst set --ssd 1 --ncqsupport --IsEnabled true sst set --ssd 1 --ncqsupport IsEnabled false

Feature	Description	Command Syntax	Example
NLog	Read the NLog binary and save it to the given filename.	`dump [--help|-h] [--destination (path)] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] --nlog`	`sst dump --destination nlog_binary.bin --ssd 1 -nlog`
NVMe Controller (Show)	Show the devices list of controllers. Use the -namespace target to list controllers attached to that given namespace ID. NVMe only	`show [--help|-h] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] [--namespace (namespace id)] --nvmecontroller`	`sst show --ssd 1 --namespace 1 --nvmecontroller`
NVMe Get Feature	Show the atrributes of the NVMe feature specified (denoted by feature id).	`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) -getfeature (feature id) [--namespace (namespace id)] [--select = ('current'|'default'|'saved'|'capabilities')]`	`sst show --ssd 1 --getfeature 0x1`
NVMe Format	Issue an NVMe format to the selected drive. To by-pass the prompt, specify the -force option. NVMe only See ConfigureSSDs-NVMe-Format section for details.	`start [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --nvmeformat [--namespace (namespace id)] [--lbaformat (0-numlbaformats)] [--secureerasesetting (0|1|2)] [--protectioninformation (0|1)] [--metadatasettings (0|1)] [--Timeout (seconds)]`	`sst start --ssd 1 --nvmeformat --namespace 1 --secureerasesetting 0 --timeout 30`

Feature	Description	Command Syntax	Example
NVMe Log (Show)	Display the given NVMe log data to the screen or save log binary to file. NVMe only	`show [--help|-h] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] --nvmelog [('commandeffect-slog' | 'changedname-spacelist' | 'error-info' | 'smarthealthinfo' | 'firmwareslotinfo' | 'temperaturestatistics' | 'queuemetrics', 'performancebooster' )]`	`sst show --ssd 1 --nvmelog --smarthealthinfo`
NVMe Reset	Performs an NVMe reset on the targeted NVMe controller	`reset [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --nvmecontroller`	`sst reset --ssd 1 --nvme-controller`

NVMe Timestamp	Returns the current timestamp value for the targeted controller.
	
	Sets the timestamp value in the controller.
	
	Note: Units are in milliseconds.
		`showtimestamp:`
		`show [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --getfeature --timestamp`
		
		`settimestamp:`
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --Timestamp --time_stamp (value)`
			`sst show --ssd 1 --get-feature timestamp`
			
			`sst set --ssd 1 --Time-stamp --time_stamp 0`

Feature	Description	Command Syntax	Example
OCP Latency Monitor	Set OCP Latency Monitor values	`sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath --OCPLatencyMonitor [--Save 'true'|'false'] [--ActiveBucketTimerThreshold 16-bit hex] [--ActiveThresholdA 8-bit hex] [--ActiveThresholdB 8-bit hex] [--ActiveThresholdC 8-bit hex] [--ActiveThresholdD 8-bit hex] [--ActiveLatencyConfiguration 16-bit hex] [--ActiveLatencyMinimumWindow 8-bit hex] [--DebugLogTriggerEnable 16-bit hex] [--DiscardDebugLog 8-bit hex] [--LatencyMonitorFeatureEnable 8-bit hex] [--File file]`  Set The Latency Monitor feature, add -source file and specify latency monitoring data structure entries in json format as below. Refer to OCP specification for value ranges and bitmasks `options:` `[--help, -h] Display help for the command.` `[--output, -o] Change the output format. One of 'text', 'nvmxml' or 'json'. (text|nvmxml|json)` `--ssd Device index or serial number or physical path is required. (Index|SerialNumber|PhysicalPath)` `--OCPLatencyMonitor Latency Monitor feature.` `[--Save] Enables the Save (SV) bit. Default is false. ('true'|'false')` `[--ActiveBucketTimerThreshold] (16-bit hex)` `[--ActiveThresholdA] (8-bit hex)` `[--ActiveThresholdB] (8-`	`sst set --ssd 1 --OCPLatencyMonitor --file latencydata.json`

Feature	Description	Command Syntax	Example
Performance	Show properties related to device performance metrics.	`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] -performance`	`sst show --ssd 1 --performance`

Performance Booster	Boost performance of SSD by flushing cache. User can start, stop, or track progress of cache flushing feature.
	
	Selected drives only
		`start [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --performancebooster`
		
		`stop [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) -performancebooster`
		
		`show [--help|-h] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] --nvmelog [('commandeffectslog'|'changednamespacelist'|'errorinfo'|'smarthealthinfo'|'firmwareslotinfo'|'temperaturestatistics'|'queuemetrics'|'performancebooster')]`
			`sst start --ssd 1 --performancebooster`
			
			`sst stop --ssd 1 --performancebooster`
			
			`sst show --ssd 1 --performancebooster`

Feature	Description	Command Syntax	Example

Phy Speed Configuration	Display the PHY Counters data to the screen. Set the drive's PHY settings. Set the drive's negotiated Serial ATA signal speed.
	
	ATA only
		`show [--help|-h] [--output|-o (text|nvmxml|json)] -phycounters [--ssd [(Index|SerialNumber|PhysicalPath)]]`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --phyconfig (0|1|2|3)`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --physpeed (1.5|3|6)`
			`sst show --phycounters --ssd 1`
			
			`sst set --ssd 1 --phyconfig 1`
			
			`sst set --ssd 1 --physpeed 1.5`

Physical Sector Size	Display the selected drives physical sector size to the screen. ATA only Caution: Changes drive sector size	`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) physicalsectorsize = (512|4096)`	`sst set --ssd 1 --physicalsectorsize 512`

PLI Test Time Interval	Display the selected drive's PLI test time interval, and option flag.
	
	ATA only
		`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --plitesttimeinterval (0-6)`
			`sst show -d plitesttimeinterval --ssd 1`
			
			`sst set --ssd 1 --plitesttimeinterval 2`

Feature	Description	Command Syntax	Example

PLP Check	Set PLP Interval and show PLP Check Value	`sst set [--help|-h] [{-}output | -o (text | nvmxml | jason0] [--ssd [index | serialNumber | PhysicalPath)]] --OCP-PLPCheck --PLPCheckInter-val (interval value)`
		
		`sst show [ help|-h] [{-}output | -o (text |nvmxml | jason0] [--ssd [index | serialNum-ber | PhysicalPath)]] --PLPCheck [Select ('cur-rent' | 'default' | 'saved' | 'capabili-ties')]`
			`sst set --ssd 1 --OCP-PLPCheck --PLPCheckInter-val 10`
			
			`sst show --ssd 1 --get-feature OCPPLPCheck --select current`

Power Governor Average	Display the selected drive's power governor average power setting.	`show [--help|-h] [--display|-d (prop-erty1,...)] [--all|-a] [--output|-o (text| nvmxml|json)] --ssd [(Index|SerialNum-ber|PhysicalPath)]`	`sst show -d powergover-noraveragepower --ssd 1`

Power Governor (PGM) (Burst/Mode)	Display the selected drive's power governor burst power setting. Set the device's Power Governor Mode. Supports SATA and NVMe devices.	`show [--help|-h] [--display|-d PowerGover-norMode] [--all|-a] [--output|-o (text|nvmxml| json)] --ssd [(Index| SerialNumber|Physical-Path)]`
		
		`sst set [--help, -h] [--output, -o text|nvmxml| json] --ssd Index|Serial-Number|PhysicalPath [--pgm] --PowerGovernorMode 0|1|2`
			`sst show -d powergover-normode --ssd 1`
			
			`sst set --ssd 1 --pgm --Powergovernormode 1`

Psid Revert	Issue a PSID revert to an Opal activated device. Caution: Erases your pass-word if forgotten. Data loss	`start [--help|-h] [--output|-o (text|nvmxml| json)] --ssd (Index|Seri-alNumber|PhysicalPath) --psidrevert (psid)`	`sst start --ssd 1 --psidrevert 987654321`

Feature	Description	Command Syntax	Example
Read System Snapshot	Read the system snapshot from the device and save it to a binary file.	`dump [--help|-h] [--destination (path)] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --systemsnapshot`	`sst dump --ssd 1 --systemsnapshot`

Sanitize	Erase all accessible storage.	`start [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --sanitize [(block|crypto|overwrite|exit_failure)] [--nodeallocateaftersanitize (true|false)] [--overwriteinvertpattern (true|false)]`
		
		`[--overwritepasscount = (integer)] [--allowunrestrictedexit (true|false)] [--overwritepattern (32-bit hex pattern)] [--returnimmediately (true|false)]`
			`sst start --ssd 1 -sanitize`

Secure Erase (ATA Secure Erase)	Secure Erase data on the selected drive. ATA only	`start [--help|-h] [--output|-o (text|nvmxml|json)] [--ssd (Index|SerialNumber|PhysicalPath)] --secureerase`	`sst start --ssd 1 --secureerase`

Self Test	Execute a drive self-test routine on the selected drive.	`start [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --selftest [('short'|'extended'|'conveyance')]`
		
		`sst show [ help | -h] [ -output | -o (text |table |json] [--ssd [index | serialNumber | PhysicalPath)]] --selftest`
			`sst start --ssd 1 --selftest short`
			
			`sst show --ssd 1 --selftest`

Feature	Description	Command Syntax	Example

Smart	Display selected drive's SMART data to the screen.	`sst show [--help, -h] [--output, -o 'text'|'table'|'json'|'csv'] [--display, -d] [--all, -a] --smart [--extended, -e] [--IncludeNVMeSmartHealthLog] --ssd`	`sst show --smart --ssd 1`
			
			`sst show -o table --smart --ssd 1`
			
			`sst show -o json --smart --ssd 1`
			
			`sst show -o table --smart F6 --ssd 0`

SMBus Address	Display the selected drive's SM bus address.
	
	NVMe only
	
	Caution: May lock system if conflicting address set.
		`show [--help|-h] [--display|-d SMBusAddress] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --SMBus --smbusaddress (address)`
			`sst show -d -SMBus --smbusaddress --ssd 1`
			
			`sst set --ssd 1 --SMBus --smbusaddress 106`

Spread Spectrum Clocking (Disable/Enable)	Disable/Enable the drive's spread spectrum clocking feature.
	
	ATA only
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --sscenabled ('true'|'false')`	`sst set --ssd 1 --sscenabled false`
			
			`sst set --ssd 1 --sscenabled true`

Standby Immediate	Send an ATA Standby Immediate command to the selected drive. This will prepare the drive for a power cycle. ATA only	`start [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) -standby`	`sst start --ssd 1 --standby`

Feature	Description	Command Syntax	Example

Telemetry	Read the Telemetry Log binary and save it to the given filename. Configure log notification	`sst dump [--help, -h] [--destination path] [--dataarea 1-4] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --telemetrylog [--HostInitiated true|false] [--RetainAsynchronousEvent (true|false)`	`sst dump --destination telemetry_data.bin --ssd 1 ---telemetrylog --HostInitiated true`
			
			`sst dump --destination telemetry_data.bin --dataarea 3 --ssd 1 --- telemetrylog --HostInitiated true`

Temperature Logging Interval	Display the selected drive's temperature logging interval time, and option flag.
	
	ATA only
		`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --temperatureloggininterval (time)`
			`sst show -d temperatureloggininterval --ssd 1`
			
			`sst set --ssd 1 --temperatureloggininterval 2`

Temp Threshold (Set)	Set the drives temperature threshold value. NVMe only Caution: If set incorrectly could overheat drive.	`sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath --TempThreshold --tempCelcius value`	`sst set --ssd 1 --TempThreshold --tempCelcius 65`

Thermal Throttle	Display the Thermal Throttle status. Optional parameter is used to enable/disable thermal throttling.	`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`
		
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --thermalthrottleenabled ('true'|'false')`
			`sst show -d thermalthrottleenabled --ssd 2`
			
			`sst set --ssd 2 --thermalthrottleenabled false`

Feature	Description	Command Syntax	Example
Trim	Trim the device. Specify what to trim by specifying the StartLBA and Count properties. WARNING: This command willmake your data inaccessible!	`start [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --trim --startlba (integer) --count (integer)`	`sst start --ssd 1 --trim --startlba 0 --count 1024`

UUID	Feature to show Universally Unique Identifier data	`dump [--help|-h] -destination (path) [--output|-o (text|nvmxml|json)] [--ssd (Index|SerialNumber|PhysicalPath)] --identify --uuidlist`	`sst show --ssd 1 --identify --uuidlist`
			
			`sst dump --destination targetfile.bin --ssd 1 --identify --uuidlist`

Feature	Description	Command Syntax	Example

Workload Tracker	Feature to track set of key workload data.
	
	Set Workload Tracker feature properties and threshold.
	
	See: Workload Tracker Logs to get data
	
	NVMe Only
	
	Selected drives Only
		Set Workload data properties:
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --WorkloadTracker --WorkloadTrackerEnable (value) [--LogGroup (value [0..6])] [--SampleTime (value)]`
		`LogGroup Values (0-6):`
		`0 = G0 Misalignment (default)`
		`1 = CmdQ Stats`
		`2 = Internal Only`
		`3 = Random vs.Sequential Data`
		`4 = Detailed Throttle Data`
		`5 = Detailed Power Data`
		`6 = Defrag status`
		`SampleTime Values (1-15):`
		`0 = Default`
		`1 = 1ms`
		`2 = 5ms`
		`3 = 10ms`
		`4 = 50ms`
		`6 = 500ms`
		`7 = 1sec`
		`8 = 5sec`
		`9 = 10sec`
		`10 = 30sec`
		`11 = 1min`
		`12 = 5min`
		`13 = 10min`
		`14 = 30min`
		`15 = 1Hr`
		Set Feature Threshold:
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --WorkloadTrackerThreshold --WorkloadTrackerThreshold (value in percentage)`
		Disable the Feature:
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --WorkloadTracker --WorkloadTrackerEnable false`
			`sst set --ssd 1 --WorkloadTracker --WorkloadTrackerEnable true --LogGroup 6 --SampleTime=3`
			
			`sst set --ssd 1 --WorkloadTracker --WorkloadTrackerThreshold 90`
			
			`sst set --ssd 1 --WorkloadTracker --WorkloadTrackerEnable false`

Feature	Description	Command Syntax	Example

Workload Tracker Log	Get Workload Feature logs
	
	Timed Log:
	Get time elapsed log in CSV format for specified time and interval
	
	NVMe Only
	
	Selected drives Only
		Get Log:
		`show [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) -nvmelog WorkloadTrackerLog`
		
		Get Timed Log:
		`dump [--help|-h] [--destination (path)] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] – WorkloadLogTime = (value in seconds) --WorkloadLogInterval (value in seconds)`
			`sst show --ssd 1 -nvmelog WorkloadTrackerLog`
			
			`sst dump --destination WorkloadLog.csv --ssd 1 --WorkloadLogTime 5 --WorkloadLogInterval 2`

Feature	Description	Command Syntax	Example

Write Cache (Disable/Enable Reordering State)	Display/Disable/Enable drive's write cache/cache reordering statefeature ATA only	`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) [--writecache] --WriteCacheState 1|2|3`
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --writecacheenabled ('true' | 'false')`
		`show [--help|-h] [--display|-d (property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]`
		`set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --writecachereorderingstateenabled ('true'|'false')`
			`sst show -d writecacheenabled --ssd 1`
			
			`sst set --ssd 1 --writecachestate 1`
			
			`sst set --ssd 1 --writecacheenabled false`
			
			`sst set --ssd 1 --writecacheenabled true`
			
			`sst show -d writecachereorderingstateenabled --ssd 1`
			
			`sst set --ssd 1 --writecachereorderingstateenabled true`

Write Same	Issue SCT Write Same command to the selected drive. The start LBA, number of sectors, and data pattern must be specified. The tool will prompt prior to issuing the Write Same command. Caution: Overwrites sectors on drive with a HEX pattern.	`start [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --writesame [--Count (sectors)] [--HexPattern (0x00 - 0xFFFFFFFF)] [--LBA (0-Max LBA)]`	`sst start --ssd 1 --writesame Count 5 LBA 0 HexPattern 0x0000ABAB`

Note: (on device target options)

- In Windows, device can be targeted with BootDrive option in addition to Index|SerialNumber|PhysicalPath
- PhysicalPath option may not work with some Linux distributions.

4 Feature Details

4.1 Show Device Information

This section provides different options to retrieve device related information.

4.1.1 Show Device List

Show information about one or more SSD devices.

Generally, this command is run as a first step to get list of devices attached and get device index.

Syntax

```
sst show [--help|-h] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]
```

Options

Option	Description
[--display|-d]	Filters the returned properties by explicitly specifying a comma separated list of any of the properties defined in the Return Data section.
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd [(Index|SerialNumber|PhysicalPath|BootDrive)]	Restricts output to specific SSD by supplying the device's Index or Serial Number. By default, the command displays all SSDs. BootDrive option available in Windows only.

Properties

This command does not support any properties

Examples

Lists all the devices attached to the system. Basic/default properties are displayed for each device.

```
sst show --ssd
```

Lists basic default information for drive at index 0

```
sst show --ssd 0
```

Sample Output

Default show output for --ssd target in default text format

```
>sst.exe show --ssd

- BTCP351406LV1 1 -

Bootloader : Value not found
Capacity : 1.92 TB (1,920,383,410,176 bytes)
DevicePath : \\.\PHYSICALDRIVE1
DeviceStatus : Healthy
Firmware : G70YG420
Index : 1
MaximumLBA : 3750748847
ModelNumber : SB5PH27X019T
NamespaceId : 1
PercentOverProvisioned : 100.00
ProductFamily : Solidigm D7-PS1010 Series
SMARTEnabled : True
SectorDataSize : 512
SerialNumber : BTCP351406LV1
```

Default show output for --ssd target in JSON format

```
>sst.exe show -o json --ssd
{
        "BTCP351406LV1 1":
        {
                "Bootloader":"",
                "Capacity":"1.92 TB (1,920,383,410,176 bytes)",
                "DevicePath":"\\\\.\\PHYSICALDRIVE1",
                "DeviceStatus":"Healthy",
                "Firmware":"G70YG420",
                "Index":1,
                "MaximumLBA":3750748847,
                "ModelNumber":"SB5PH27X019T",
                "NamespaceId":1,
                "PercentOverProvisioned":100.00,
                "ProductFamily":"Solidigm D7-PS1010 Series",
                "SMARTEnabled":true,
                "SectorDataSize":512,
                "SerialNumber":"BTCP351406LV1"
        }
}
```

4.1.2 Show Device Data

Show detailed information about one or more SSD devices.

Syntax

```
sst show [-all|-a] [--display|-d] [-help|-h] [--output|-o (text|nvmxml|json)] --ssd [(Index|SerialNumber|PhysicalPath)]
```

Options

Option	Description
[-all|-a]	Shows all properties.
[-display|-d]	Filters the returned properties by explicitly specifying a comma separated list of any of the properties defined in the Return Data section.
[-help|-h]	Displays help for the command.
[-output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd [(Index|SerialNumber|PhysicalPath|Bootdrive)]	Restricts output to specific SSD by supplying the device's Index or Serial Number. By default, the command displays all SSDs. For Windows, Boot drive option can be used to target the boot drive.

Properties

This command does not support any properties.

Return Data

By default, a table is displayed with the following default properties. Use the options to show more detail.

Property	Description
AccessibleMaxAddressSupported	(For ATA devices only) True if the devices support the accessible max address commands (Identify device Word 103 bit 8).
AggregationThreshold	(For NVMe devices only) Shows the minimum number of completion queue entries to aggregate per interrupt vector before signaling an interrupt to the host. This value is zero-based.
AggregationTime	(For NVMe devices only) Shows the recommended maximum time in 100 microsecond increments that a controller may delay an interrupt due to interrupt coalescing.
ArbitrationBurst	(For NVMe devices only) Shows the maximum number of commands that the controller may launch at one time. This value is specified in 2^n. A value of 7 indicates no limit.
AsynchronousEventConfiguration	(For NVMe devices only) Determines whether an asynchronous event notification is sent to the host for the corresponding Critical Warning specified in the SMART / Health Information Log.
Bootloader	(Default; For NVMe devices only, if present) Return the devices Bootloader Revision.
BusType	(Windows OS only) The bus type value determined by Windows.

Property	Description
ControllerDescription	(Currently in Windows OS only) Shows a description of the controller the device is attached to.
ControllerID	(Windows OS only) The ID value of the device controller found in the Windows OS registry.
ControllerIDEMode	Shows if the controller the device is attached to is in IDE mode. Returns either True or False.
ControllerManufacturer	(Currently in Windows OS only) The manufacturer of the controller that the device is attached to.
ControllerService	(Currently in Windows OS only) Displays the controller driver sys file that the attached device is connected to.
DigitalFenceSupported	(For ATA devices only) True if the device supports the Digital Fence feature.
DIPMEnabled	(For ATA devices only) True if the device has DIPM enabled (Identify device Word 79 bit 3).
DIPMSupported	(For ATA devices only) True if the device supports DIPM (Identify device Word 78 bit 3).
DevicePath	(Default) The OS path to the device (i.e. \\.\PhysicalDrive0).
DeviceStatus	(Default) Report the device's status. In the current implementation this will look at ErrorString and if it is empty it will report "Healthy" otherwise it will report the value of ErrorString.
DriverCommunicationError	(Default; if present) This reports if the tool detected a potential error with communicated with the driver the device is connected to. For example, the tool will detect an error if the Server 2012 R2* system is using the in-box NVMe driver from Microsoft*. SST does not support communication with that driver.
DriverDescription	Description of the controller driver that the device is attached to. Currently in Windows OS only.
DriverMajorVersion	Major version of the controller driver that the device is attached to. Currently in Windows OS only.
DriverManufacturer	Manufacturer of the controller driver that the device is attached to. Currently in Windows OS only.
DriverMinorVersion	Minor version of the controller driver that the device is attached to. Currently in Windows OS only.
EnduranceAnalyzer	The drives life expectancy in years. This utilizes the 0xE2, 0xE3 and 0xE4 SMART attributes. If these SMART attributes have a value of 0xFFFF then they are still in the reset state and a 60+ minute workload (per 240GB) has yet to run. If the media wear indicator is zero, then the workload has not induced enough wear to calculate an accurate life expectancy.
ErrorString	Shows a description of the error state of the drive. **Note:** The drive is not in an error state if the value is blank.
Firmware	(Default) Shows the firmware revision of the device.
FirmwareUpdateAvailable	(Default) Shows the firmware revision available for update. Firmware updates are carried within the tool as a "payload" binary for each supported drive. Tool reports 'Firmware is up to date as of this tool release' if the device's firmware is up to date.
HighPriorityWeightArbitration	(For NVMe devices only) Shows the number of commands that can be executed from the high priority services class in each arbitration round. This is a 0's based value.
IEEE1667Supported	(For ATA devices only) Shows if the IEEE1667 protocol is supported. Reports True or False.
Index	(Default) Shows the SSD device index, used for device selection.

Property	Description
SolidigmGen3SATA	True if the device is a Solidigm™ (formerly Intel®) SATA SSD.
SolidigmNVMe	True if the device is a Solidigm™ (formerly Intel®) NVMe SSD.
IOCompletionQueuesRequested	(For NVMe devices only) Shows the number of IO Completion Queues requested.
IOSubmissionQueuesRequested	(For NVMe devices only) Shows the number of IO Submission Queues requested.
LatencyTrackingEnabled	Shows if the latency tracking feature of the drive is enabled (True) or disabled (False).
LBAFormat	(For NVMe devices only) Shows the LBA Format that the drive is configured with. This has a possible value of 0 to 'NumLBAFormats'. Details of the different LBA formats can be found in Identify Namespace. This value can be changed by NVMe format.
LowPriorityWeightArbitration	(For NVMe devices only) Shows the number of commands that can be executed from the low priority services class in each arbitration round. This is a 0's based value.
MaximumLBA	Shows the devices maximum logical block address.
MediumPriorityWeightArbitration	(For NVMe devices only) Shows the number of commands that can be executed from the medium priority services class in each arbitration round. This is a 0's based value.
MetadataSetting	(For NVMe devices only) Shows the device's Metadata setting. One of either: • 0: Metadata is transferred as part of a separate contiguous buffer. • 1: Metadata is transferred as part of an extended data LBA. This can be changed by issuing an NVMe format.
ModelNumber	(Default) Shows the model number assigned to the device.
NamespaceId	(For NVMe devices only) Shows the value of the namespace ID of the device if it has one. The namespace must be allocated and attached.
NativeMaxLBA	Shows the devices native maximum logical block address set in manufacturing. This value cannot be changed. It represents the physical maximum number of LBAs for the device.
NumErrorLogPageEntries	(For NVMe devices only) Shows the number of Error Information log entries that are stored by the controller. This value is zero-based.
NumLBAFormats	(For NVMe devices only) Shows the number of different LBA Formats the device supports. This value is zero-based. For example, a value of 6 means there are 0 to 6 possible LBA Formats (7 total).
NVMeControllerID	(For NVMe devices only) The value of the NVMe controller ID found in the NVMe identify controller structure.
NVMePowerState	(For NVMe devices only) Shows the power state of the controller. Supported power states are described in the Identify Controller data structure. This is an NVMe Get Feature (feature ID=2)
NVME_1_0_Supported	(For NVMe devices only) True if the device supports the NVMe 1.0 command specification.
NVME_1_2_Supported	(For NVMe devices only) True if the device supports the NVMe 1.2 command specification.
PCILinkGenSpeed	(For NVMe devices only) The devices PCI Gen speed.
PCILinkWidth	(For NVMe devices only) The devices PCI link width. E.g. 4 or 8

Property	Description
PhyConfig	(For ATA devices only) Shows the devices PHY Configuration. One of the following: • 0: Default enterprise settings • 1: Client settings • 2: Alternate enterprise settings
PhysicalSectorSize	(For ATA devices only) Shows the physical sector size in bytes. One of either: • 512 • 4096
PhysicalSize	The physical size of the device in bytes. Value is in decimal format.
PhySpeed	(For ATA devices only) Shows the maximum physical speed (in gigabits-per-second) of the device. One of the following: • 1.5 • 3 • 6
PLITestTimeInterval	(For ATA devices only) Shows the PLI Test Time interval in minutes of the device. One of: • 0: 0 min, no immediate test. • 1: 0 min, do immediate test. • 2: 60 min, do immediate test. • 3: 1440 min, do immediate test. • 4: 4320 min, do immediate test. • 5: 10080 min, do immediate test. • 6: 20160 min, do immediate test.
PNPString	(Windows OS only) The devices PNP String from the Windows registry.
ProductProtocol	The devices protocol e.g. ATA or NVME.
PowerGovernorAverage-Power	(For ATA devices only) Shows the device's power governor average power in milliwatts.
PowerGovernorBurstPower	(For ATA devices only) Shows the device's power governor burst power in milliwatts.
PowerGovernorMode	• Shows the devices' Power Governor state. 0: 25-watts for PCIe NVMe devices; 40W for PCIe NVMe x8 devices; Unconstrained for SATA devices. • 1: 20-watts for PCIe NVMe devices; 35W for PCIe NVMe x8 devices; Typical (7-watts) for SATA devices. • 2: 10-watts for PCIe NVMe devices; 25W for PCIe NVMe x8 devices; Low (5-watts) for SATA devices.
ProductFamily	(Default) Shows the SSD Series name.
ProtectionInformation	(For NVMe devices only) Shows the device's protection information type setting. One of: • 0: Protection information is not enabled. • 1: Protection information type 1 is enabled. This can be changed by issuing an NVMe format.
ProtectionInformationLoca-tion	(For NVMe devices only) Shows the device's protection information location setting. One of: • 0: Protection information is transferred as the last 8 bytes of metadata. • 1: Protection information is transferred as the first 8 bytes of metadata.

Property	Description
RAIDMember	Shows if the device is part of a RAID. Currently only support RST RAID drivers and LSI Mega RAID.
ReadErrorRecoveryTimer	(For ATA devices only) Shows the time limit for read error recovery. Time limit is in 100 millisecond units.
SanitizeBlockEraseSupported	(For ATA devices only) True if the device supports the Sanitize block erase command (Identify device Word 59 bit 15).
SanitizeCryptoScrambleSupported	(For ATA devices only) True if the device supports the Sanitize crypto scramble command (Identify device Word 59 bit 13).
SanitizeSupported	(For ATA devices only) True if the device supports the Sanitize feature (Identify device Word 59 bit 12).
SataGen1	(For ATA devices only) Shows if the device supports SATA Gen 1 speed. Reports True or False.
SataGen2	(For ATA devices only) Shows if the device supports SATA Gen 2 speed. Reports True or False.
SataGen3	(For ATA devices only) Shows if the device supports SATA Gen 3 speed. Reports True or False.
SataNegotiatedSpeed	(For ATA devices only) Coded value indicating current negotiated SATA signal speed. One of: • 1: SATA Gen1 rate of 1.5 Gbps • 2: SATA Gen2 rate of 3 Gbps • 3: SATA Gen3 rate of 6 Gbps
SCSIPortNumber	(Windows OS only) The port number of the SCSI path used by Windows.
SectorSize	Shows the sector size in bytes.
SecurityEnabled	(For ATA devices only) Shows if the device is in security enabled state. Reports True or False.
SecurityFrozen	(For ATA devices only) Shows if the device is in security frozen state. Reports True or False.
SecurityLocked	(For ATA devices only) Shows if the device is security locked. Reports True or False.
SecuritySupported	(For ATA devices only) True if the devices supports ATA Security feature (Identify device Word 128 bit 0).
SerialNumber	(Default) Shows the serial number assigned to the device.
SMARTEnabled	Shows if SMART capabilities are enabled on the device. Reports True or False.
SMARTSelfTestSupported	(For ATA devices only) True if the device supports the drive self-test feature (Identify device Word 84 bit 1).
SMBusAddress	(For NVMe devices only) Shows the SM Bus address of the drive. Value of 255 means the SM Bus is disabled.
SSCEnabled	(For ATA devices only) Shows if the device has spread spectrum clocking enabled or not. Reports True or False.
StorageSpaceMember	Shows if the device is a Windows Storage Space member.
TemperatureLoggingInterval	(For ATA devices only) Shows the time interval for temperature logging.
TempThreshold	(For NVMe devices only) Shows the temperature threshold of the overall device. Units are in Celsius.

Property	Description
TimeLimitedErrorRecovery	(For NVMe devices only) Shows the limited retry timeout value in 100 millisecond units. This applies to I/O commands that indicate a time limit is required. A value of 0 indicates that there is no time-out.
TrimSupported	True if the device supports Trim feature.
VolatileWriteCacheEnabled	(For NVMe devices only) True if the volatile write cache is enabled.
WriteAtomicityDisableNormal	(For NVMe devices only) Shows the atomic write status. One of: • 0: If cleared to '0', the atomic write unit for normal operation shall be honored by the controller. • 1: The host specifies that the atomic write unit for normal operation is not required and the controller shall only honor the atomic write unit for power fail operations.
WriteCacheEnabled	(For ATA devices only) Shows if the device has write cache enabled. Reports True or False.
WriteCacheState	(For ATA devices only) Shows the device's write cache state. One of: • 1: Write cache state is determined by ATA Set Features • 2: Write cache is enabled. • 3: Write cache is disabled.
WriteCacheSupported	(For ATA devices only) Shows if the device supports write cache capabilities. Reports True or False.
WriteErrorRecoveryTimer	(For ATA devices only) Shows the time limit for write error recovery in 100 millisecond units.
WriteCacheReorderingStateEnabled	(For ATA devices only) True if the write cache reordering state is enabled on the SATA device.

Examples

Lists basic properties for the SSD device at index 1.

```
sst show --ssd 1
```

List all properties for the SSD device at Index 1

```
sst show -a --ssd 1
```

List specific property(s) for the SSD device at Index 1

```
sst show -d Product, ProductFamily --ssd 1
```

Sample Output

Default show output for --ssd target in default text format

```
>sst.exe show –-ssd
- Intel SSD DC P3608 Series CVF85156007H400AGN-2 -
Bootloader : 8B1B0131{
DevicePath : \\\\.\\PHYSICALDRIVE1{
DeviceStatus : Healthy{
Firmware : 8DV10171{
FirmwareUpdateAvailable : The selected drive contains current firmware as of this tool release.{
Index : 0{
ModelNumber : INTEL SSDPECME400G4{
```

```
ProductFamily : Intel SSD DC P3608 Series{
SerialNumber : CVF85156007H400AGN-2
```

Default show output for --ssd target in JSON format

```
>sst.exe show –o json --ssd
{
"Intel SSD DC P3608 Series CVF85156007H400AGN-2":
{
        "Bootloader":"8B1B0131",
        "DevicePath":"\\\\.\\PHYSICALDRIVE1",
        "DeviceStatus":"Healthy",
        "Firmware":"8DV10171",
        "FirmwareUpdateAvailable":"The selected drive contains current firmware as of this tool
 release.",
        "Index":0,
        "ModelNumber":"SOLIDIGM SBFPF2BV076T",
        "ProductFamily":"Intel SSD DC P3608 Series",
        "SerialNumber":"CVF85156007H400AGN-2"
{
}
```

Show specific properties for --ssd target in JSON format

```
>sst.exe show –d Product, ProductFamily, Firmware -o json --ssd 1
{
"PHYJ0204000W3P8DGN":
        {
                "Firmware":"7CV10141",
                "Product":"Youngsville Refresh Refresh",
                "ProductFamily":"Intel SSD DC S4620 Series"
        },
}
```

4.1.3 Show Health Sensors

The show –sensor command shows the health sensor properties of one or more SSDs.

Syntax

```
sst show [--all|-a] [--display|-d] [--help|-h] [--output|-o (text|nvmxml|json)] --sensor [--ssd (Index|
SerialNumber|PhysicalPath)]
```

Options

Option	Description
[-all|-a]	Show all properties.
[-display|-d]	Filters the returned properties by explicitly specifying a comma separated list of any of the properties defined in the Return Data section.
[-help|-h]	Displays help for the command.

Option	Description
[-output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--sensor	Displays the health related properties for device(s).
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number. The default is to display sensors for all manageable SSDs.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software.

Return Data

The command displays the following properties for each sensor command option. This output could be filtered by specifying the Properties with the –display option. It can be further filtered by specifying the ID property.

Note: Some health sensor properties are not supported some devices.

Property	Description
AvailableSpare	(NVMe Devices Only). Percentage (0 to 100%) of the remaining spare capacity available.
AverageNandEraseCycles	Average number of NAND erase cycles for all blocks.
CrcErrorCount	Total number of interface (SATA or NVMe) CRC errors.
EndToEndErrorDetectionCount	Total number of end to end detected errors.
EnduranceAnalyzer	Reports the expected drive life in years.
EraseFailCount	Total number of raw erase fails.
ErrorInfoLogEntries	(NVMe Devices Only). Number of entries in the Error Info Log page over the life of the controller.
HighestLifetimeTemperature	(NVMe Devices Only). The highest lifetime temperature (in Celsius) of the device.
LowestLifetimeTemperature	(NVMe Devices Only). The lowest lifetime temperature (in Celsius) of the device.
MaxNandEraseCycles	Max number of NAND erase cycles for all blocks.
MediaErrors	(NVMe Devices Only). Number of times where the controller detected an unrecovered data integrity error.
MinNandEraseCycles	Min number of NAND erase cycles for all blocks.
PercentageUsed	Estimate of the percentage of life used of the device.

Property	Description
PowerCycles	(NVMe Devices Only). Number of power cycles.
PowerOnHours	Contains the number of power on hours of the device.
ProgramFailCount	Total number of raw program fails.
SpecifiedPCBMaxOperatingTemp	(NVMe Devices Only). Specified PCB maximum operating temperature in degrees C.
SpecifiedPCBMinOperatingTemp	(NVMe Devices Only). Specified PCB minimum operating temperature in degrees C.
Temperature	Total temperature of the device in degrees C
ThermalThrottleCount	The total number of times thermal throttle has been activated.
ThermalThrottleStatus	The amount that Thermal Throttle that is applied. A value of zero is no throttle. 100 is 100% throttling applied.
UnsafeShutdowns	Reports the number of unsafe shutdowns over the life of the device.

Examples

Default show output for –sensor target in default text format.

```
>sst.exe show --sensor
- Intel SSD DC P3608 Series CVF85156007H400AGN-2 -

AvailableSpare : 100
AverageNandEraseCycles : 1
CrcErrorCount : 0
DeviceStatus : Healthy
EndToEndErrorDetectionCount : 0
EnduranceAnalyzer : Media Workload Indicators have reset values. Run an hour or more workload (per
 240GB) prior to running the endurance analyzer.
EraseFailCount : 0
ErrorInfoLogEntries : 0x00
HighestLifetimeTemperature : 53
LowestLifetimeTemperature : 16
MaxNandEraseCycles : 3
MediaErrors : 0x00
MinNandEraseCycles : 0
PercentageUsed : 0
PowerCycles : 0x01F
PowerOnHours : 0x0667
ProgramFailCount : 0
SpecifiedPCBMaxOperatingTemp : 85
SpecifiedPCBMinOperatingTemp : 0
Temperature : 317
ThermalThrottleCount : 0
ThermalThrottleStatus : 0
```

```
UnsafeShutdowns : 0x05
```

Note: Specified the ID property to limit the output.

4.1.4 Show SMART

The show –smart command shows the SMART attributes for SSD(s).

Syntax

```
sst show [--help, -h] [--output, -o 'text'|'table'|'json'|'csv'] [--display, -d] [--all, -a] --smart [--extended, -e] [--IncludeNVMeSmartHealthLog] --ssd
```

Options

Option	Description
[--all|-a]	Show all properties.
[--display|-d]	Filters the returned properties by explicitly specifying a comma separated list of any of the properties defined in the Return Data section.
[--help|-h]	Displays help for the command.
[--output|-o (text | table | json | csv)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'table', 'json', and 'csv'.
[--extended|-e]	Display additional/sub fields in table format

Targets

Target	Description
--smart [(id)]	Displays SMART attributes for device(s). Specific SMART attributes can be selected if (id) is given.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number. The default is to display sensors for all manageable SSDs.

Properties

Property	Description
IncludeNVMeSmartHealthLog=(true|false)	Determines whether to return NVMe SMART health log attributes in addition to standard.SMART attributes. Default is false. Supported for NVMe only.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software.

Return Data

The command displays the following properties for each SMART attribute. This output could be filtered by specifying the Properties with the –display option.

Note: Some optional properties are not supported on all device sensors and SMART Attributes F4/F5 are reported in Bytes.

Property	Description
Action	(Optional) Shows the Pass/Fail status based on the Pre-failure/advisory status bit.
Description	Shows a string representation of the ID token.
ID	The SMART Attribute ID token. Smart ID: 03, 04, 05, 0C, AA, B8, BB, C1, E2, E9, F2 Not all drives have the same SMART Id's
Normalized	Shows the normalized value of the SMART attribute.
Raw	Shows the raw value of the SMART Attribute. Value is in decimal.
Status	(Optional) Shows the status flags for the SMART attribute: • Bit 0 Pre-failure/advisory bit • Bit 1 Online data collection • Bit 2 Performance attribute • Bit 3 Error rate attribute • Bit 4 Event count attribute • Bit 5 Self-preserving attribute • Bits 6 - 15 Reserved
Threshold	(Optional) Shows the SMART Attributes threshold value.
Worst	(Optional) Shows the SMART attributes worst normalized value. Maintained for the life of the device.

Examples

Format - Text (default):

Show –smart output in default text format.

Get specific attribute(AB):

```
>sst show --smart AB --ssd 0
- SMART Attributes -

- AB -
  ID : AB
  Description : Program Fail Count
  Action : Pass
  Normalized : 100
  Raw : 2
  Status : 50
  Threshold : 0
  Worst : 100
```

Note: Specified the ID property to limit the output.

Shows only the ID and Raw value of the SMART F3 Attribute for all SSDs.

```
>sst show -d ID,Raw --smart F3 --ssd

Serial Number : PHYJ0204000SERIAL
SMART Attributes

- F3 -
  ID : F3
  Raw : 3993267
```

Format - JSON:

Show specific attribute(AB), custom fields(ID, Status) in JSON format.

```
>sst show -o json -d ID,Status --smart AB --ssd 0
{
    "schemaVersion": 1,
    "groups": [
        {
            "heading": [
                "Serial Number : PHYJ0204000WSERIAL",
                "SMART Attributes"
            ],
            "id": {
                "SerialNumber": "PHYJ0204000WSERIAL"
            },
            "status": null,
            "emptyMessage": null,
            "items": [
                {
                    "id": "AB",
                    "fields": [
                        {
                            "name": "ID",
                            "value": "AB"
                        },
                        {
                            "name": "Status",
                            "value": "50"
                        }
                    ]
                }
            ],
            "columns": [
                "ID",
                "Status"
            ],
            "showDetails": false
```

```
      }
   ]
```

Format - Table:

Note: SATA and NVME will display different default columns. Use --extended option to display additional fields.

Show default table format output:

```
>sst show -o table --smart --ssd 0

Serial Number : PHYJ0204000W3P8DGN
SMART Attributes

 ID  Description                          Normalized  Threshold  Worst  Raw           Status  Action
 --  -----------------------------------  ----------  ---------  -----  ------------  ------  ------
 05  Re-allocated Sector Count            99          0          99     41            50      Pass
 09  Power-On Hours Count                 100         0          100    21748         50      Pass
 0C  Power Cycle Count                    100         0          100    147           50      Pass
 AA  Available Reserved Space             99          21         99     0             51      Pass
 AB  Program Fail Count                   100         0          100    2             50      Pass
 AC  Erase Fail Count                     100         0          100    0             50      Pass
 AE  Unexpected Power Loss Count          100         0          100    129           50      Pass
 AF  Power Loss Protection Failure        100         10         100    768807209296  51      Pass
 B7  SATA Downshift Count                 100         0          100    0             50      Pass
 B8  End-to-End Error Detection Count     100         90         100    0             51      Pass
 BB  Uncorrectable Error Count            100         0          100    0             50      Pass
 BE  Case Temperature                     79          0          76     504627221     34      Pass
 C0  Unsafe Shutdown Count                100         0          100    129           50      Pass
 C2  Temperature                          100         0          100    21            34      Pass
 C5  Pending Sector Count                 100         0          100    0             18      Pass
 C7  CRC Error Count                      100         0          100    0             62      Pass
 E1  Host Writes                          100         0          100    1074528       50      Pass
 E2  Timed Workload - Media Wear          100         0          100    65535         50      Pass
 E3  Timed Workload - Host Read/Write Ratio  100      0          100    65535         50      Pass
 E4  Timed Workload Timer                 100         0          100    65535         50      Pass
 E5  Erase Count                          100         0          100    0             50      Pass
 E6  GMR Head Amplitude                   100         0          100    0             50      Pass
 E8  Available Reserved Space             99          21         99     0             51      Pass
 E9  Media Wearout Indicator              100         0          100    0             50      Pass
 EA  Thermal Throttle Status              100         0          100    0             50      Pass
 EB  Power Loss Protection Failure        100         10         100    768807209296  51      Pass
 F1  Total LBAs Written                   100         0          100    1074528       50      Pass
 F2  Total LBAs Read                      100         0          100    70266         50      Pass
 F3  Vendor Specific                      100         0          100    3993294       50      Pass
 F6  Vendor Specific                      100         0          100    1             50      Pass
```

Show ID, Raw and Threshold in table format

```
>sst show -d ID,Raw,Threshold -o table --smart --ssd 0

Serial Number : PHYJ0204000W3P8DGN
```

```
SMART Attributes

 ID  Raw           Threshold
 --  ------------  ---------
 05  41            0
 09  21748         0
 0C  147           0
 AA  0             21
 AB  2             0
 AC  0             0
 AE  129           0
 AF  768807209296  10
 B7  0             0
 B8  0             90
 BB  0             0
 BE  504627221     0
 C0  129           0
 C2  21            0
 C5  0             0
 C7  0             0
 E1  1074528       0
 E2  65535         0
 E3  65535         0
 E4  65535         0
 E5  0             0
 E6  0             0
 E8  0             21
 E9  0             0
 EA  0             0
 EB  768807209296  10
 F1  1074528       0
 F2  70266         0
 F3  3993294       0
 F6  1             0
```

Format - CSV:

Note: First column in CSV will be Serial Number to distinguish drives.

Show csv format output for ssd

```
>sst show -o CSV --smart --ssd 0
SerialNumber,ID,Description,Normalized,Threshold,Worst,Raw,Status,Action
PHYJ0204000WSERIAL,05,Re-allocated Sector Count,99,0,99,41,50,Pass
PHYJ0204000WSERIAL,09,Power-On Hours Count,100,0,100,21749,50,Pass
PHYJ0204000WSERIAL,0C,Power Cycle Count,100,0,100,147,50,Pass
PHYJ0204000WSERIAL,AA,Available Reserved Space,99,21,99,0,51,Pass
PHYJ0204000WSERIAL,AB,Program Fail Count,100,0,100,2,50,Pass
PHYJ0204000WSERIAL,AC,Erase Fail Count,100,0,100,0,50,Pass
PHYJ0204000WSERIAL,AE,Unexpected Power Loss Count,100,0,100,129,50,Pass
PHYJ0204000WSERIAL,AF,Power Loss Protection Failure,100,10,100,768811338064,51,Pass
```

```
PHYJ0204000WSERIAL,B7,SATA Downshift Count,100,0,100,0,50,Pass
PHYJ0204000WSERIAL,B8,End-to-End Error Detection Count,100,90,100,0,51,Pass
PHYJ0204000WSERIAL,BB,Uncorrectable Error Count,100,0,100,0,50,Pass
PHYJ0204000WSERIAL,BE,Case Temperature,79,0,76,504627221,34,Pass
PHYJ0204000WSERIAL,C0,Unsafe Shutdown Count,100,0,100,129,50,Pass
PHYJ0204000WSERIAL,C2,Temperature,100,0,100,21,34,Pass
PHYJ0204000WSERIAL,C5,Pending Sector Count,100,0,100,0,18,Pass
PHYJ0204000WSERIAL,C7,CRC Error Count,100,0,100,0,62,Pass
PHYJ0204000WSERIAL,E1,Host Writes,100,0,100,1074528,50,Pass
PHYJ0204000WSERIAL,E2,Timed Workload - Media Wear,100,0,100,65535,50,Pass
PHYJ0204000WSERIAL,E3,Timed Workload - Host Read/Write Ratio,100,0,100,65535,50,Pass
PHYJ0204000WSERIAL,E4,Timed Workload Timer,100,0,100,65535,50,Pass
PHYJ0204000WSERIAL,E5,Erase Count,100,0,100,0,50,Pass
PHYJ0204000WSERIAL,E6,GMR Head Amplitude,100,0,100,0,50,Pass
PHYJ0204000WSERIAL,E8,Available Reserved Space,99,21,99,0,51,Pass
PHYJ0204000WSERIAL,E9,Media Wearout Indicator,100,0,100,0,50,Pass
PHYJ0204000WSERIAL,EA,Thermal Throttle Status,100,0,100,0,50,Pass
PHYJ0204000WSERIAL,EB,Power Loss Protection Failure,100,10,100,768811338064,51,Pass
PHYJ0204000WSERIAL,F1,Total LBAs Written,100,0,100,1074528,50,Pass
PHYJ0204000WSERIAL,F2,Total LBAs Read,100,0,100,70266,50,Pass
PHYJ0204000WSERIAL,F3,Vendor Specific,100,0,100,3993515,50,Pass
PHYJ0204000WSERIAL,F6,Vendor Specific,100,0,100,1,50,Pass
```

4.1.5 Show Performance Metrics

The show –performance command shows the performance metrics for one or more SSDs.

Syntax

```
sst show [--all|-a] [--display|-d] [-help|-h] [--output|-o (text|nvmxml|json)] --performance [--ssd
 (Index|SerialNumber|PhysicalPath)]
```

Options

Option	Description
[-all|-a]	Show all properties.
[-display|-d]	Filters the returned properties by explicitly specifying a comma separated list of any of the properties defined in the Return Data section.
[-help|-h]	Displays help for the command.
[-output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
-performance	Displays performance metrics for device(s).

Target	Description
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number. The default is to display sensors for all manageable SSDs.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software.

Return Data

The command displays the following properties associated with performance metrics. This output could be filtered by specifying the Properties with the –display option.

Note: Some optional properties are not supported on some devices.

Property	Description
TotalLBAsRead	(ATA Devices only). Total number of sectors read by the Host.
TotalLBAsWritten	(ATA Devices only). Total number of sectors written by the Host.
ControllerBusyTime	(NVMe Devices only). Amount of time the controller is busy with I/O commands. Value is reported in minutes.
DataUnitsRead	(NVMe Devices only). The number of 512 byte data units the host has read from the device. Value is reported in units of 1000 (1 = 1000 units of 512 bytes).
DataUnitsWritten	(NVMe Devices only). The number of 512 byte data units the host has written to the device. Value is reported in units of 1000 (1 = 1000 units of 512 bytes).
HostReadCommands	(NVMe Devices only). The number of read commands completed by the controller.
HostWriteCommands	(NVMe Devices only). The number of write commands completed by the controller.

Examples

Default show output for –performance target in default text format.

```
>sst.exe show --performance
- Intel SSD DC P3608 Series CVF85156007H400AGN-2 -

ControllerBusyTime : 0x0
DataUnitsRead : 0x01F097
DataUnitsWritten : 0x0
HostReadCommands : 0x86A392
HostWriteCommands : 0x7772E3

- Intel SSD DC P3608 Series CVF85156007H400AGN-1 -

ControllerBusyTime : 0x0
DataUnitsRead : 0x10
DataUnitsWritten : 0x0
HostReadCommands : 0x777E07
HostWriteCommands : 0x7772E3
```

4.1.6 Show Device Identification Structures

The show –identify command shows the device identification structures for one or more SSDs.

Syntax

```
sst show [--help, -h] [--output, -o text|nvmxml|json|csv] [--ssd Index|SerialNumber|PhysicalPath] --
identify --namespace namespace id

sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify
 --iocommandset

sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify
 --uuidlist

sst show [--help, -h] [--output, -o text|nvmxml|json|csv] [--ssd Index|SerialNumber|PhysicalPath] --
identify --nvmecontroller

sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify
 --ns_granularity

sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify
 --namespacelist 'attached' | 'allocated' | 'IOAllocated' [--csi csi id]

sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify
 --controllerlist [--namespace namespace id]

sst show [--help, -h] [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify
 --descriptors [--namespace namespace id]


sst dump [--help, -h] --destination path [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|Phys-
icalPath] --identify --namespace namespace id

sst dump [--help, -h] --destination path [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|Phys-
icalPath] --identify --iocommandset

sst dump [--help, -h] --destination path [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|Phys-
icalPath] --identify --uuidlist

sst dump [--help, -h] --destination path [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|Phys-
icalPath] --identify --nvmecontroller

sst dump [--help, -h] --destination path [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|Phys-
icalPath] --identify --ns_granularity

sst dump [--help, -h] --destination path [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|Phys-
icalPath] --identify --namespacelist 'attached' | 'allocated' | 'IOAllocated' [--csi csi id]
```

```
sst dump [--help, -h] --destination path [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify --controllerlist [--namespace namespace id]

sst dump [--help, -h] --destination path [--output, -o text|nvmxml|json] [--ssd Index|SerialNumber|PhysicalPath] --identify --descriptors [--namespace namespace id]
```

Options

Option	Description
[-help|-h]	Displays help for the command.
[-output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--identify	Displays identification structures for SSDs.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.
--namespace namespace id --iocommandset --uuidlist --nvmecontroller --ns_granularity --namespacelist 'attached' | 'allocated' | 'IOAllocated' [--csi csi id] --controllerlist [--namespace namespace id] --descriptors [--namespace namespace id]	Provide option for identify

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software.

Return Data

This command will return human readable text of the specified Identify structure. Use the –output option to return the parsed data in different formats.

Note: Some identify structures are not supported on all devices.

Examples

Parse the ATA identify device structure. Only a snippet of the output is shown below:

```
>sst show --ssd 1 --identify --nvmecontroller
- Identify Controller SOLIDIGMSN1AAAAA -
```

```
- Byte 0-1 -

PCI Vendor ID (VID) : 0x1C5C

- Byte 2-3 -

PCI Subsystem Vendor ID (SSVID) : 0x1C5C

- Byte 4-23 -

Serial Number : SOLIDIGMSN1AAAAA

- Byte 24-63 -

Model Number : SOLIDIGM_A1111111111

- Byte 64-71 -

Firmware Revision : A111
....(cont)
```

Display the list of Namespace ID's that have been created.

```
>sst.exe show --ssd 2 --identify --namespacelist allocated
- Allocated Namespace IDs CVEK5AAAAAAAAAAGN -
Namespace ID : 1
Namespace ID : 2
```

4.1.7 Show NVMe Controller Information

The show –nvmecontroller command lists the NVMe controller IDs for one or more SSDs. Only supported on NVMe devices.

Syntax

```
sst show [--help|-h] [--output|-o (text|nvmxml|json)] [--ssd (Index|SerialNumber|PhysicalPath)] --identify –-nvmecontroller [--namespace (id)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--identify	(Required)
--nvmecontroller	(Required) Will parse the list of all NVMe controllers of the device. You can change the behavior if -namespace target is given.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.
[--namespace (id)]	(Optional) If given, with a valid namespace ID value, then the list of controllers attached to that given namespace ID is returned. The Tool will issue the NVMe identify command with CNS=0x12.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

Return Data

This command will parse, and return human readable text. Use the –output option to return the parsed data in different formats.

Examples

Parsed list of NVMe controller ID's on all drives.

```
> sudo sst show --ssd 1 --identify --nvmecontroller

- BTWL238602AM800DGN -

Status : The selected drive does not support this feature.

- All Controllers CVEK5316004R800AGN -

Number of Controller Entries : 2
Controller ID : 0
Controller ID : 1
```

4.1.8 Show NVMe Log Information

The show –nvmelog command parses NVMe Logs for one or more SSDs. Only supported on NVMe devices.

Syntax

```
sst show [--help|-h] [--output|-o (text|nvmxml|json)] [--ssd [(Index|SerialNumber|PhysicalPath)]] --
nvmelog
[('commandeffectslog'|'changednamespacelist'|'errorinfo'|'smarthealthinfo'|'firmwareslotinfo'|'temperatu
restatistics'|'queuemetrics'|'performancebooster'|'sanitizestatus'|'ocperrorrecovery'|'ocpsmartcloud')]
 [--namespacespecific (true|false)] [--logspecificfield (int)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--nvmelog ('error-info'| 'smarthealthinfo'| 'firmwareslotinfo'|'temperaturestatistics'|'queuemetrics' | 'performancebooster'|'sanitizestatus' |'ocperrorrecovery'|'ocpsmartcloud')	Parse the NVMe log structures. Valid input would be • ErrorInfo – Error Information Log • SmartHealthInfo – SMART Health Information Log • FirmwareSlotInfo – Firmware Slot Information Log • TemperatureStatistics – Temperature Statistics Log • QueueMetrics – Submission and completion queue metrics • Performance booster (client only) – Show the contents of the performance booster log • SanitizeStatus – Show the contents of the sanitize status log • OCPErrorRecovery – Show the contents of the error recovery log • OCPSMARTCloud – Show the contents of the SMART cloud log • Log ID Value – Specify an arbitrary integer value. SST will send the log page command, and either returned parsed data or raw binary data.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.

Properties

Property	Description
--NamespaceSpecific	Determines whether log page is namespace specific or not Valid values are: • True • False
--LogSpecificField	Specifies the log specific field (LSP) of the log page Valid values are: • Integer

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

To run this command option with Target 'QueueMetircs', the specified device must be an NVMe SSD and have firmware 8DV101F0 or newer firmware. With earlier firmware, SST will report command failure.

Return Data

This command will parse and return human readable text of the specified NVMe log. Use the –output option to return the parsed data in different formats.

Examples

Parsed output of the SMART and Health information log in text format.

```
>sst.exe show --nvmelog smarthealthinfo
 - SMART and Health Information CVF85156007H400AGN-2 -

Available Spare Normalized percentage of the remaining spare capacity available : 100
Available Spare Threshold Percentage : 10
Available Spare Space has fallen below the threshold : False
Controller Busy Time : 0x0
Critical Warnings : 0
Data Units Read : 0x01F097
Data Units Written : 0x0
Host Read Commands : 0x86A392
Host Write Commands : 0x7772E3
Media Errors : 0x0
Number of Error Info Log Entries : 0x0
Percentage Used : 0
Power Cycles : 0x1F
Power On Hours : 0x0668
Media is in a read-only mode : False
Device reliability has degraded : False
Temperature - (Kelvin) : 318
Temperature has exceeded a critical threshold : False
Unsafe Shutdowns : 0x05
Volatile memory backup device has failed : False
```

Parsed output of the Temperature Statistics log in JSON format.

```
>sst.exe show –o json --nvmelog temperaturestatistics
{
 "Temp Statistics CVF85156007H400AGN-2":
 {
         "Current Temperature":45,
         "Overtemp shutdown Flag for Last Drive Overheat":0,
         "Overtemp shutdown Flag for Life Drive Overheat":0,
         "Highest Temperature":53,
         "Lowest Temperature":16,
         "Maximum operating temperature":85,
         "Minimum operating temperature":0,
         "Estimated offset in Celsius":-5
 }
}
```

4.1.9 Show Phy Counters

The show –phycounters command parses the phy counter information for one or more SSDs. Only supported on SATA devices.

Syntax

```
sst show [--help|-h] [--output|-o (text|nvmxml|json)] --phycounters [--ssd (Index|SerialNumber|Physical-Path)]
```

Options

Option	Description
[-help|-h]	Displays help for the command.
[-output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--phycounters	Displays the device Phy Counters. ATA only
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to a specific SSD by supplying the SSD Index or Serial Number.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be a SATA device.

Return Data

This command will parse and return human readable text of the PHY Counters structure. Use the –output option to return the parsed data in different formats.

Examples

Parsed output of the PHY Counters structure in text format. Not all counters are shown below.

```
>sst.exe show --phycounters
 - PHY Counters CVLV119200C4300DGN -

- Counter ID 0x001 -

ID : 001
Description : Command failed and ICRC error bit set to one in Error register
Value : 0

- Counter ID 0x004 -

ID : 004
```

```
Description : R_ERRP response for Host-to-Device Data FIS
Value : 0

- Counter ID 0x007 -

ID : 007
Description : R_ERRP response for Host-to-Device non-Data FIS
Value : 0

- Counter ID 0x008 -

ID : 008
Description : Device-to-Host non-Data FIS retries
Value : 0
```

Parsed output of the PHY Counters in JSON output. Not all counters are shown below.

```
>sst.exe show –o json ––phycounters
{
"PHY Counters CVLV119200C4300DGN":
{
        "Counter ID 0x001":
        {
                "ID":"001",
                "Description":"Command failed and ICRC error bit set to one in Error register",
                "Value":0
        },
        "Counter ID 0x004":
        {
                "ID":"004",
                "Description":"R_ERRP response for Host-to-Device Data FIS",
                "Value":0
        },
        "Counter ID 0x007":
        {
                "ID":"007",
                "Description":"R_ERRP response for Host-to-Device non-Data FIS",
                "Value":0
        },
        "Counter ID 0x008":
        {
                "ID":"008",
                "Description":"Device-to-Host non-Data FIS retries",
                "Value":0
        },
...
}
```

4.1.10 Show HDA Temperature

The show –hdatemperature command parses the HDA Temperature and temperature history information for one or more SSDs. Only supported on SATA devices.

Syntax

```
sst show [--help|-h] [--output|-o (text|nvmxml|json)] --hdatemperature [--ssd (Index|SerialNumber|PhysicalPath)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--hdatemperature	Displays HDA Temperature and history information.
[--ssd (Index|SerialNumber|PhysicalPath)]	Restricts output to a specific SSD by supplying the SSD Index or Serial Number.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be a SATA device.

Return Data

This command will parse, and return human readable text of the HDA temperature and history structure. Use the –output option to return the parsed data in different formats.

Examples

Parsed output of the HDA Temperature structure in text format. Not all data is shown below.

```
>sst.exe show --hdatemperature
- HDA Temperature BTWL238602AM800DGN -

Format Version : 2
Sampling period : 1
Interval : 1
Maximum recommended continuous operating temperature : 70
Maximum Temperature Limit : 70
Minimum recommended continuous operating temperature : 0
Minimum Temperature Limit : 0
Circular buffer size : 478
Last Updated Entry in the circular buffer : 372
```

```
- Temperatures -

Index 0 : Initial value or discontinuity in temperature recording.
Index 1 : 17
Index 2 : Initial value or discontinuity in temperature recording.
Index 3 : 13
Index 4 : 15
Index 5 : 15
Index 6 : 16
Index 7 : 16
Index 8 : 16
Index 9 : 17
Index 10 : 17
Index 11 : 17
Index 12 : 17
Index 13 : 18
Index 14 : 18
Index 15 : 18
Index 16 : 18
Index 17 : 18
Index 18 : 18
```

4.1.11 Show Read and Write Latency Statistics Tracking Information

The show –latencystatistics command parses the Latency Statistics Logs for one or more SSDs. The LatencyTrackingEnabled must be set to true in order to read the logs.

Syntax

```
sst show [--help|-h] [--output|-o (text|nvmxml|json)] --latencystatistics (‘reads’|’writes’) [--ssd
 (Index|SerialNumber|PhysicalPath)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: ‘text’ (Default), ‘json’, and ‘nvmxml’.

Targets

Target	Description
--latencystatistics (reads|writes)	Used to display latency statistics logs for read or write commands. In order to successfully read the logs the LatencyTrackingEnabled property must be set to True. See Modify Device *on page 85*.

Target	Description
[--ssd (Index|SerialNumber|PhysicalPath)]	Restricts output to a specific SSD by supplying the SSD Index or Serial Number.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software.

Return Data

This command will parse and return human readable text of the Latency Statistics Log structure. Use the –output option to return the parsed data in different formats.

Examples

Parsed output of the Latency Statistics log structure for read commands. Output is in text format. Not all data is shown below.

```
>sst.exe show --latencystatistics reads

- Latency Statistics For Read Commands CVF85156007H400AGN-1 -

Major Version : 3
Minor Version : 0
Group 1 Details : Range is 0-1ms. Step is 32us. Bucket size is 4 bytes. Total 32 buckets.
Group 2 Details : Range is 1-32ms. Step is 1ms. Bucket size is 4 bytes. Total 31 buckets.
Group 3 Details : Range is 32ms-1s. Step is 32ms. Bucket size is 4 bytes. Total 31 buckets.

- Group 1 Group 1 -

Bucket 1 : 0
Bucket 2 : 0
Bucket 3 : 0
Bucket 4 : 0
Bucket 5 : 0
Bucket 6 : 0
Bucket 7 : 0
Bucket 8 : 0
Bucket 9 : 0
Bucket 10 : 0
Bucket 11 : 0
Bucket 12 : 0
Bucket 13 : 0
Bucket 14 : 0
Bucket 15 : 0
Bucket 16 : 0
Bucket 17 : 0
Bucket 18 : 0
Bucket 19 : 0
Bucket 20 : 0
Bucket 21 : 0
```

```
Bucket 22 : 0
Bucket 23 : 0
Bucket 24 : 0
Bucket 25 : 0
Bucket 26 : 0
Bucket 27 : 0
Bucket 28 : 0
Bucket 29 : 0
Bucket 30 : 0
Bucket 31 : 0
Bucket 32 : 0

- Group 2 Group 2 -

Bucket 1 : 0
Bucket 2 : 0
Bucket 3 : 0
```

4.1.12 Show Parsed Persistent Event Log Data

The show -persistenteventlog command parses persistent event log data either from a binary file saved on the system or pulled directly from the drive.

Syntax

```
sst show [--help|-h] [--recent-entries|-e (int)] [--source (path)] [--destination (path)] [-output|-o
 (text|nvmxml|json)] [--ssd (Index|SerialNumber|PhysicalPath)] --persistenteventlog
```

Options

Option	Description
[-help|-h]	Displays help for the command.
[--recent-entries|-e]	Option to get number of recent entries. Provide number of entries.
[--source (path)]	If used, will parse a persistent event log binary file at this path. If this option is not used, data will instead be pulled from the drive and parsed immediately (if a persistent event log context is established).
[--destination (path)]	If used, will output the parsed persistent event log data to a text file at the specified path. If not used, the parsed data will be displayed to the user.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--persistenteventlog	Used to parse persistent event log data.

Target	Description
[--ssd (Index|SerialNumber|PhysicalPath)]	Restricts output to a specific SSD by supplying the SSD Index or Serial Number.

Limitations

The persistent event log command must be supported by the drive. In order to pull the persistent event log data from the drive and parse it (by omitting the -source option) a persistent event log context must be established using the dump command, see Drive logs *on page 114*.

Return Data

This command will parse and return human readable text of the persistent event log. Use the –output option to return the parsed data in different formats.

Examples

Parse a previously dumped persistent event log binary (see Drive logs *on page 114*).

```
sst.exe show --source PEL_binary.bin --destination PEL_parsed.txt --persistenteventlog
```

Parse persistent event log data directly from a drive

```
sst.exe show -e 50 --destination PEL_parsed.txt --ssd 1 --persistenteventlog
```

4.1.13 Show NVMe Get Feature Information

The show –getfeature command sends a get feature command with the specified feature id (FID) for SSDs. Only supported on NVMe devices.

Syntax

```
sst show [--help|-h] [--display|-d (Property1,...)] [--all|-a] [--output|-o (text|nvmxml|json)]
 --ssd (Index|SerialNumber|PhysicalPath) --getfeature (feature id, feature name or 'list')
 [--namespace (namespace id)] [--UUIDIndex = ((0-127))] [TransferBytes = ((int))] [--Select =
 ('current'|'default'|'saved'|'capabilities')]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

<table>
<tr><th>Target</th><th>Description</th></tr>
<tr><td>--getfeature (feature id)</td><td>Specify the feature id (FID) of the NVMe get feature command
Examples of valid input would be
• General NVMe feature list
<table>
<tr><th>[FID]</th><th>[Feature Name]</th><th>[Feature Description]</th></tr>
<tr><td>list</td><td>List all feature IDs available in the tool. Not checked for drive support</td><td></td></tr>
<tr><td>0x01</td><td>Arbitration</td><td>Arbitration</td></tr>
<tr><td>0x02</td><td>PowerManagement</td><td>Power Management</td></tr>
<tr><td>0x03</td><td>LBARangeType</td><td>LBA Range Type</td></tr>
<tr><td>0x04</td><td>TempThreshold</td><td>Temperature Threshold</td></tr>
<tr><td>0x05</td><td>ErrorRecovery</td><td>Controls the Error Recovery attributes</td></tr>
<tr><td>0x06</td><td>VolatileWriteCache</td><td>Volatile Write Cache</td></tr>
<tr><td>0x07</td><td>NumberOfQueues</td><td>Number Of Queues</td></tr>
<tr><td>0x08</td><td>InterruptCoalescing</td><td>interrupt coalescing settings</td></tr>
<tr><td>0x09</td><td>InterruptVectorConfig</td><td>Interrupt Vector Configuration</td></tr>
<tr><td>0x0A</td><td>WriteAtomicity</td><td>Write Atomicity Normal</td></tr>
<tr><td>0x0B</td><td>AsyncEventConfig</td><td>Asynchronous Event Configuration</td></tr>
<tr><td>0x0E</td><td>Timestamp</td><td>Timestamp</td></tr>
<tr><td>0x16</td><td>HostBehaviorSupport</td><td>Host Behavior Support</td></tr>
<tr><td>0xC0</td><td>OCPErrorInjection</td><td>OCP Error Injection</td></tr>
<tr><td>0xC1</td><td>MaxLBA</td><td>Max LBA</td></tr>
<tr><td>0xC1</td><td>OCPClearFirmwareUpdateHistory</td><td>OCP Clear Firmware Update History</td></tr>
<tr><td>0xC2</td><td>OCPReadOnlyWriteMode</td><td>OCP Read Only Write Mode</td></tr>
<tr><td>0xC2</td><td>NativeMaxLBA</td><td>Native Max LBA</td></tr>
<tr><td>0xC3</td><td>OCPClearPCIeCorrectable</td><td>OCP Clear PCIeCorrectable</td></tr>
<tr><td>0xC4</td><td>OCPIEEE1667Silo</td><td>OCP IEEE 1667Silo</td></tr>
<tr><td>0xC5</td><td>OCPLatencyMonitor</td><td>OCP Latency Monitor</td></tr>
<tr><td>0xC6</td><td>OCPPLPCheck</td><td>OCP PLP Check</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Target</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>[FID]</th><th>[Feature Name]</th><th>[Feature Description]</th></tr>
<tr><td>0xC7</td><td>OCPDSSDPowerState</td><td>OCP DSSD Power State</td></tr>
<tr><td>0xC8</td><td>OCPTelemetryProfile</td><td>OCP Telemetry Profile</td></tr>
<tr><td>0xC8</td><td>SMBus</td><td>SM Bus</td></tr>
<tr><td>0xC9</td><td>LEDActivity</td><td>LED Activity</td></tr>
<tr><td>0xC9</td><td>OCPDSSDAsyncEventConfig-uration</td><td>OCP DSSD Async Event Con-figuration</td></tr>
<tr><td>0xCB</td><td>DynamicMMIO</td><td>Dynamic MMIO</td></tr>
<tr><td>0xCB</td><td>PCIeSwitch</td><td>PCIe Switch</td></tr>
<tr><td>0xD5</td><td>ResetCRCError</td><td>Reset CRC Error</td></tr>
<tr><td>0xD9</td><td>DisableThermalThrottle</td><td>Enabling/Disabling Thermal Throttling for EMC</td></tr>
<tr><td>0xDA</td><td>DellHostMetaData</td><td>Dell - Host Metadata</td></tr>
<tr><td>0xE9</td><td>LongLatencyConfig</td><td>Long Latency Configuration</td></tr>
<tr><td>0xF1</td><td>WorkloadTracker</td><td>Set/Get Enable Workload Tracker/Trigger</td></tr>
<tr><td>0xF5</td><td>WorkloadTrackerThreshold</td><td>Set Read/Write Workload Tracker Threshold</td></tr>
</table>
</td></tr>
<tr><td>[--ssd (Index|SerialNum-ber|PhysicalPath)]</td><td>(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.</td></tr>
<tr><td>-namespace (namespace Id)</td><td>Namespace target is optional. Must specify namespace ID if being used.</td></tr>
</table>

Properties

Below are the properties that can be modified.

Property	Description
--UUIIDIndex	Specify the UUID Index for vendor specific get feature
TransferBytes(int)	Specify transfer bytes when expecting buffer date to be returned
Select	Sets the select value Valid values are: • Current (default) • Default • Saved • Capabilities

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

The command is entirely dependent on valid feature id values. Different drive families will support different feature ids.

Return Data

This command will parse and return human readable text of the specified NVMe get feature. Use the –output option to return the parsed data in different formats.

Examples

Parsed output of get feature with FID=1

```
> sst show --ssd 0 --getfeature 1
- BTLJ723607AK2P0BGN -

DWORD0 : 0x07070703
```

4.1.14 Show NVMe IEEE 1667 Silo Information

The show OCPIEEE1667Silo command sends a get feature command with the specified feature id (FID) for SSDs. Used to show IEEE 1667 Silo information.

Only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Syntax

```
set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --
OCPIEEE1667Silo --Enable ('true'|'false')
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--OCPIEEE1667Silo	Specifies that IEEE 1667 Silo information is requested. No input required.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.

Properties

Below are the properties that can be modified.

Property	Description
Select	Sets the select value Valid values are: • Current • Default • Saved • Capabilities

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

This command is only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Return Data

This command will parse and return human readable text of the specified NVMe get feature. Use the –output option to return the parsed data in different formats.

Examples

```
> sst show --ssd 0 --getfeature OCPIEEE1667Silo
- BTLJ723607AK2P0BGN –
Silo : Currently Enabled
```

4.1.15 Show NVMe Read Only/Write Through Mode Information

The show -ReadOnlyWriteThrough command sends a get feature command with the specified feature id (FID) for SSDs. Used to show Read Only/Write Through mode information.

Only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Syntax

```
sst show [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --getFea-
ture OCPReadOnlyWriteThrough
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--getFeature OCPReadOnlyWriteThrough	Specifies that Read Only/Write Through Mode information is requested.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.

Properties

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

This command is only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Return Data

This command will parse and return human readable text of the specified NVMe get feature. Use the –output option to return the parsed data in different formats.

Examples

```
> sst show --ssd 1 -getFeature --OCPReadOnlyWriteMode
- BTCP351406LV1 -

Mode : The device will transition to Read Only Mode(ROM) at End of Life (EOL) or on PLP failure
```

4.1.16 Show OCP Error Injection Information

The show -ErrorInjection command sends a get feature command with the specified feature id (FID) for SSDs. Used to show error injection information.

Only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Syntax

```
sst show [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --OCPErrorInjection
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--getFeature OCPErrorInjection	Specifies that Error Injection information is requested. No input required.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.

Properties

No properties available for this feature

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

This command is only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Return Data

This command will parse and return human readable text of the specified NVMe get feature. Use the –output option to return the parsed data in different formats.

Examples

```
> sst show --ssd 1 --getFeature OCPErrorinjection
- BTLJ723607AK2P0BGN –
- Error Injection Info Error Injection Info –
Number of Error Injections  : 0
```

4.2 Configure SSDs

Configuring SSDs requires the CLI verbs Load (Firmware Update), Set (Modify Device), and Start (Execute Drive Function).

4.2.1 Firmware Update

Updates the firmware on the SSD. On the next reset, the firmware will become active.

SST show devices (sst.exe show --ssd) will indicate if there is firmware update available. Run the load command to update the firmware. Firmware update binaries are embedded in the tool. User doesn't have to provide firmware binary.

Note: Systems configured with the SATA Controller set to IDE mode are not supported.

Syntax

```
sst load [--force|-f] [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|Physical-
Path)
```

Options

Option	Description
[--force|-f]	Displays a prompt by default when invoking the Firmware Update command. Use this option to bypass the prompt.
[--help|-h]	Displays help for the command
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	Updates the firmware on the specified SSD. Firmware binaries are embedded into the tool. See the FirmwareUpdateAvailable property for firmware update eligibility.

Properties

This command does not support any properties.

Limitations

To run this command, you must have the appropriate host system privileges and the specified SSDs must be manageable by the host software.

Return Data

The CLI indicates the status of the firmware update operation.

Sample Output

>sst.exe load --ssd 0

WARNING! You have selected to update the drives firmware!

Proceed with the update? (Y|N): y

Updating firmware...The selected drive contains current firmware as of this tool release.

>sst.exe load --ssd 0

WARNING! You have selected to update the drives firmware!

Proceed with the update? (Y|N): n

Canceled.

>sst.exe load -f --ssd 0

Updating firmware...

Firmware update successful.

>sst.exe load --ssd 0

WARNING! You have selected to update the drives firmware!

Proceed with the update? (Y|N): y

Updating firmware...

Firmware update successful.

Examples

Updates the firmware on the device at index 1.

```
sst load --ssd 1
```

4.2.2 Firmware Update (with binary file)

This method is only to be used if firmware update binaries are available and update is not available in the tool.

Use this method with caution and at your own risk as drive may become unresponsive if invalid binary is loaded.

For NVMe drives, user can also choose the following options:

- Commit Action to indicate when the firmware should be activated.
- Firmware Slot the firmware should be loaded into if drive supports multiple slots.

Syntax

```
sst load --source firmwareBinaryFile.bin --ssd (Index|SerialNumber|PhysicalPath)

NVMe only:
sst load --source firmwareBinaryFile.bin --ssd (Index|SerialNumber|PhysicalPath) [--FirmwareSlot
 (0,1..7)] --CommitAction (2,3)
```

Options

Option	Description
[--force|-f]	Displays a prompt by default when invoking the Firmware Update command. Use this option to bypass the prompt.
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	Updates the firmware on the specified SSD. Firmware binaries are embedded into the tool. See the FirmwareUpdateAvailable property for firmware update eligibility.
--source	Provide firmware binary for the update
[--FirmwareSlot]	Slot number that should be updated
[--CommitAction]	Numberic data indicating Commit option according to NVMe specification.

Properties

This command does not support any properties.

Limitations

To run this command, you must have the appropriate host system privileges and the specified SSDs must be manageable by the host software.

Return Data

The CLI indicates the status of the firmware update operation.

Sample Output

```
>sst load --source firmwareBinary.bin --ssd 1
WARNING! You have selected to update the drives firmware!
Proceed with the update? (Y|N): y
Updating firmware...The selected drive contains current firmware as of this tool release.

>sst.exe load --source firmwareBinary.bin --ssd 0
WARNING! You have selected to update the drives firmware!
Proceed with the update? (Y|N): n
Canceled.

>sst.exe load --source firmwareBinary.bin -f --ssd 0
Updating firmware...
The selected drive contains current firmware as of this tool release.

>sst.exe load --ssd 0
WARNING! You have selected to update the drives firmware!
Proceed with the update? (Y|N): y
Updating firmware...
Firmware update successful.
```

4.2.3 Modify Device

Changes the configurable settings on an SSD.

Note: You can only change one setting at a time.

Syntax

```
sst set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) [...]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	Modifies the selected drive by supplying its Index or Serial Number value. An --ssd must be specified for this command.

Properties

Below are the properties that can be modified. One, and only one, property must be specified.

Property	Description
DIPMEnabled	Enable or disable the SATA device's DIPM. Valid values are: • True - enables DIPM • False - disables DIPM
EnduranceAnalyzer	Resets the SMART attributes: E2, E3, and E4. The Valid value is reset. As a result, the reported raw value of these attributes will be 0xFFFF. Once the values have been reset, the device must go through a 60+ minute workload (per 240GB) for the attributes to trip.
LatencyTrackingEnabled	Enables or disables latency tracking feature. This must be enabled in order to successfully read the latency statistics logs (Show Read and Write Latency Statistics Tracking Information *on page 73*) Valid values are: • True - enables latency tracking • False - disables latency tracking
MaximumLBA	Sets the device's Maximum LBA value. This operation will overprovision the drive. The MaximumLBA can be specified in the following ways: • · xGB - Sets the devices maximum LBA such that the total capacity is the specified GB value. Value must be at least 1 and cannot exceed devices total native capacity. • X% - Sets the devices maximum LBA to the given percentage. Allowed values are 1-100%. 100% equals native maximum LBA. • · LBA - Sets the devices maximum LBA value to the given LBA. Given value must be a decimal literal. The LBA value must be at least XYZ and it cannot exceed the native maximum LBA value. • "native" - Sets the devices maximum LBA value back to its native maximum.

Property	Description
PhyConfig	(For ATA devices only) Changes the PHY configuration of the selected device. Valid values are: • 0: Default enterprise settings. • 1: Client settings • 2: Alternate enterprise settings • 3: Server Settings
PhysicalSectorSize	(For ATA devices only) Changes the devices physical sector size. Values are in byte units. Valid values are: • 512 • 4096
PhySpeed	(For ATA devices only) Changes the devices maximum allowed PHY Speed it is allowed to negotiate. Valid values are: • 1.5: SATA Gen 1 speed of 1.5 Gbs • 3: SATA Gen 2 speed of 3 Gbs • 6: SATA Gen 3 speed of 6 Gbs Actual negotiated speed is also determined by the controller the device is attached to.
PLITestTimeInterval	(For ATA devices only) Changes the devices PLI test time interval setting. Valid values are: • 0: 0 min, no immediate test • 1: 0 min, do immediate test • 2: 60 min, do immediate test • 3: 1440 min, do immediate test • 4: 4320 min, do immediate test • 5: 10080 min, do immediate test • 6: 20160 min, do immediate test
PowerGovernorMode	Changes the devices power governor mode settings. Valid values are: • 0: 25-watts for PCIe NVMe devices; 40W for PCIe NVMe x8 devices; Unconstrained for SATA devices. • 1: 20-watts for PCIe NVMe devices 35W for PCIe NVMe x8 devices; Typical (7-watts) for SATA devices. • 2: 10-watts for PCIe NVMe devices; 25W for PCIe NVMe x8 devices; Low (5-watts) for SATA devices.
ReadErrorRecoveryTimer	(For ATA devices only) Sets the devices error recovery timer for reads. Value is in 100-microsecond units (e.g., a value of 1 = 100 ms, 2 = 200 ms). Valid values are: • 0-65535
SMBusAddress	(For NVMe devices only) Sets the devices SM Bus Address. Valid values are: • 1-255. A value of 255 will disable SM Bus
SSCEnabled	(For ATA devices only) Toggles the devices spread spectrum clocking (SSC) feature on and off. • "True" - enable SSC • "False" - disable SSC Device must be power cycled after setting.
TempLoggingInterval	(For ATA devices only) Sets the devices temperature logging interval. Value is in seconds. Valid values are: • 0-65535

Property	Description
TempThreshold	(For NVMe devices only) Sets the devices temperature threshold. Value is in degrees Celsius. Valid values are: • 0-75
WriteCacheEnabled	Enable or disable the SATA device's Write Cache via ATA set features command. Valid values are: • True – enables Write Cache • False - disables Write Cache
WriteCacheState	(For ATA devices only) Sets the devices write cache state. Valid values are: • 1: Write cache state is determined by ATA Set Features • 2: Write cache is enabled. • 3: Write cache is disabled.
WriteCacheReorderingStateEnabled	Enable or disable the SATA device's write cache reordering state. Valid values are: • True – enables write cache reordering state • False – disables write cache reordering state
WriteErrorRecoveryTimer	(For ATA devices only) Set the devices error recovery timer for writes. Value is in 100-microsecond units (e.g., a value of 1 = 100 ms, 2 = 200 ms). Valid values are: • 0-65535

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	Modifies the selected drive by supplying its Index or Serial Number value. An --ssd must be specified for this command.

Properties

Below are the properties that can be modified. One, and only one, property must be specified.

Limitations

To run this command, you must have the appropriate host system privileges and the specified SSD must be manageable by the host software.

Return Data

The CLI indicates the status of the operation.

Sample Output

```
Set WriteCacheState successful.
```

Examples

Disables the write cache state of the SSD at index 0 by setting its WriteCacheState to 3.

```
sst set –-ssd 0 --WriteCacheState 3
```

4.2.4 Execute Device Function

Use the start verb to execute a function on the selected device.

Syntax

```
start [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] –-ssd (Index|SerialNumber|PhysicalPath)
 --selftest [('short'|'extended'|'conveyance')]

start [-help|-h] [-force|-f] [--output|-o (text|nvmxml|json)] –-ssd (Index|SerialNumber|PhysicalPath) –-
nvmeformat [--lbaformat (0-numlbaformats)] [--secureerasesetting (0|1|2)] [--protectioninformation (0|
1)] [--metadatasettings (0|1)]

start [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] –-ssd (Index|SerialNumber|PhysicalPath)
 --standby
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--force|-f]	Displays a prompt by default when invoking NVMe Format functionality. Use this option to bypass the prompt.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	A specific SSD selected by supplying the SSD Index or Serial Number must be provided.
--selftest ('short'|'extended'|'conveyance')	Runs a device self-test on the selected ATA device. If no test is specified, a short test is executed.
--nvmeformat	Issues an NVMe format to the selected drive. See the properties below for details on how to configure the NVMe format. To by-pass the prompt, specify the –force option.

Target	Description
--standby	(ATA devices only) Put the selected device into standby power state. This prepares the drive for removal from the system.

Properties

Properties supported for the start verb are list below. Properties are specific to different targets.

The properties: LBAFormat, SecureEraseSetting, ProtectionInformation, and MetadataSettings are used with the –nvme-format target.

The target that they correspond to is also listed in the Description.

Property	Description
LBAFormat	(-nvmeFormat) Sets a value that corresponds to one of the supported LBA Formats described in Identify Namespace. If not provided, the tool will use the current value of the selected SSD. Valid values are: • 0-NumLBAFormats: See NumLBAFormats Property for max value.
SecureEraseSetting	(-nvmeFormat) Specifies the setting for Secure Erase. If not provided, the tool will use a value of 2. Valid values are: • 0: No secure erase. • 1: User data erase. • 2: Crypto erase.
ProtectionInformation	(-nvmeFormat) Enables different protection information types. If not provided, the tool will use the current value of the selected SSD. Valid values are: • 0: Protection information is not enabled. • 1: Protection information type 1 is enabled.
MetadataSettings	(-nvmeFormat) Specifies how metadata is transferred. If not provided, the tool will use the current value of the selected SSD Valid values are: • 0: Metadata is transferred as part of a separate contiguous buffer. • 1: Metadata is transferred as part of an extended data LBA.

Limitations

To run this command, you must have the appropriate host system privileges and the specified SSD must be manageable by the host software.

Return Data

The CLI returns the status of the command.

Examples

Issues NVMe Format to the SSD at index 1 using the default values.

```
start –ssd 1 --nvmeformat
```

Issues NVMe Format to the SSD at index 1 and set the LBA Format to 3 and enable Type 1 protection information.

```
start --ssd 1 --nvmeformat --lbaformat 3 --protectioninformation 1
```

Issues an ATA Standby Immediate to the SSD at index 1. This will prepare the drive for power removal.

```
start --ssd 1 --standby
```

Issues an extended ATA DriveSelfTest to the SSD at index 1.

```
start --ssd 1 --selftest extended
```

4.2.5 Delete Device

Delete SSD will erase all the data on the drive. For SATA devices, this will issue an ATA Secure Erase if supported, or Sanitize erase if supported. For NVMe devices, this will issue an NVMe Format command with SecureEraseSetting = 2. The function will keep the drive's current configuration.

When invoked, the tool will prompt you to proceed with the delete. To bypass the prompt, use the –force option.

Syntax

```
delete [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath)
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--force|-f]]	The tool will display a prompt by default when invoking delete. Use this option to bypass the prompt. This option will also ignore partitions on the device.
[--output|-o (text | nvmxml | json)]	Change the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNum-ber|PhysicalPath)	Delete the selected drive Device and erase all data.

Properties

This command does not support any properties.

Limitations

To successfully execute this command, the caller must have the appropriate privileges and the specified SSD must be manageable by the host software.

Return Data

The CLI will return status of the command.

Examples

Delete the device at index 1 and erase all user data.

```
delete --ssd 1
```

4.2.6 Secure Erase (ATA Secure Erase)

Perform Secure Erase on ATA drive.

When invoked, the tool will prompt you to proceed with the erase. To bypass the prompt, use the –force option.

Syntax

```
start [--help|-h] [--output|-o (text|nvmxml|json)] [--ssd (Index|SerialNumber|PhysicalPath)] --
secureerase
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--force|-f]]	The tool will display a prompt by default when invoking delete. Use this option to bypass the prompt. This option will also ignore partitions on the device.
[--output|-o (text | nvmxml | json)]	Change the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNum-ber||PhysicalPath)	Secure Erase the selected drive Device and erase all data.

Properties

This command does not support any properties.

Limitations

To successfully execute this command, the caller must have the appropriate privileges and the specified SSD must be manageable by the host software.

Return Data

The CLI will return status of the command.

Examples

Delete the device at index 1 and erase all user data.

```
start --ssd 1 --secureerase
```

4.2.7 NVMe Format

Syntax

```
start [--help|-h] [-force|-f] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath)
 -nvmeformat [--namespace (namespace id)] [--LBAFormat (0-NumLBAFormats)] [--SecureEraseSetting (0|1|2)]
 [--ProtectionInformation (0|1)] [--MetadataSettings (0|1)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Change the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.
--LBAFormat	(-nvmeFormat) Sets a value that corresponds to one of the supported LBA Formats described in Identify Namespace. If not provided, the tool will use the current value of the selected SSD. Valid values are: • 0-NumLBAFormats See NumLBAFormats Property for max value.
--SecureEraseSetting	(-nvmeFormat) Specifies the setting for Secure Erase. If not provided, the tool will use a value of 2. Valid values are: • 0: No secure erase. • 1: User data erase. • 2: Crypto erase.
--ProtectionInformation	(-nvmeFormat) Enables different protection information types. If not provided, the tool will use the current value of the selected SSD. Valid values are: • 0: Protection information is not enabled. • 1: Protection information type 1 is enabled.
--MetadataSettings	(-nvmeFormat) Specifies how metadata is transferred. If not provided, the tool will use the current value of the selected SSD Valid values are: • 0: Metadata is transferred as part of a separate contiguous buffer. • 1: Metadata is transferred as part of an extended data LBA.

Targets

Target	Description
--ssd (Index|SerialNum-ber|PhysicalPath)	(Required) A specific SSD selected by supplying the SSD Index or Serial Number must be provided.

4.2.8 Set NVMe Feature

The set –setfeature command sends a set feature command with the specified feature id (FID) for SSDs. Only supported on NVMe devices.

Syntax

```
set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --setfeature
 (feature id) [--namespace (namespace id)] [--UUIDIndex ((0-127))] [--Save ((true|false))] [--DWORD11
 (32 bit hex)] [--DWORD12 (32 bit hex)] [--DWORD13 (32 bit hex)] [--InputFile (filename)]
```

Option

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--setfeature (feature id)	Specify the feature id (FID) of the NVMe set feature command Examples of valid input would be • 0x01 - Arbitration • 0x02 - PowerManagement • 0x03 - LBARangeType • 0x04 - TempThreshold • 0x05 - ErrorRecovery • 0x06 - VolatileWriteCache • 0x07 - NumberOfQueues • 0x08 - InterruptCoalescing • 0x09 - InterruptVectorConfig • 0x0A - WriteAtomicity • 0x0B - AsyncEventConfig • 0x0E - Timestamp • 0x16 - HostBehaviorSupport • 0xC0 - OCPErrorInjection • 0xC1 - MaxLBA • 0xC1 - OCPClearFirmwareUpdateHistory • 0xC2 - OCPReadOnlyWriteMode • 0xC2 - NativeMaxLBA • 0xC3 - OCPClearPCIeCorrectable • 0xC4 - OCPIEEE1667Silo • 0xC5 - OCPLatencyMonitor • 0xC6 - OCPPLPCheck • 0xC7 - OCPDSSDPowerState • 0xC8 - OCPTelemetryProfile • 0xC8 - SMBus • 0xC9 - LEDActivity • 0xC9 - OCPDSSDAsyncEventConfiguration • 0xCB - DynamicMMIO • 0xCB - PCIeSwitch • 0xD5 - ResetCRCError • 0xD9 - DisableThermalThrottle • 0xDA - DellHostMetaData • 0xDE - DellErrorInjection • 0xE9 - LongLatencyConfig • 0xF1 - WorkloadTracker • 0xF5 - WorkloadTrackerThreshold
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.
-namespace (namespace Id)	Namespace target is optional. Must specify namespace ID if being used.

Properties

Below are the properties that can be modified.

Property	Description
--DWORD11	32 bit command dword 11 structure value that is used to set the chosen feature value. See Set Features Command specification in NVMe 1.4 spec (section 5.21) for details.
--DWORD12	32 bit command dword 12 structure value.
--DWORD13	32 bit command dword 13 structure value.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

The command is entirely dependent on valid feature id values. Different drive families will support different feature ids.

Return Data

This command will send and return the status of the NVMe set feature. There is usually a corresponding get feature command (see Show NVMe Get Feature Information *on page 76*).

Examples

Parsed output of get feature with FID=1

```
> sst set --ssd 0 --setfeature 4 --DWORD11 1
- NVMeFeatures DRIVESERIALNUMBER –
Status : Completed successfully.
```

4.2.9 Set NVMe IEEE 1667 Silo

The set –IEEESilo command sends a set feature command with the specified feature id (FID) for SSDs. Used to set IEEE 16667 Silo information.

Only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Syntax

```
sst set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --
OCPIEEE1667Silo --Enable ('true'|'false')
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--OCPIEEE1667Silo	Specifies that IEEE 1667 Silo is requested. No input required.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.

Properties

Below are the properties that can be modified.

Property	Description
Enable	True to enable, false to disable.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

This command is only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Return Data

This command will send and return the status of the NVMe set IEEE 1667 Silo. See the following section for the corresponding get feature: Show NVMe IEEE 1667 Silo Information *on page 79*.

Examples

```
> sst set --ssd 1 --OCPIEEE1667Silo --Enable True
Set Enable successful. Completed successfully.
```

4.2.10 Set NVMe Read Only/Write Through Mode

The set –ReadOnlyWriteThrough command sends a set feature command with the specified feature id (FID) for SSDs. Used to set read only or write through mode as the desired device transition and end of life.

Only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Syntax

```
sst set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --OCPRead-
OnlyWriteMode --Mode (1|2)
```

Options

Option	Description
[--help|-h]	Displays help for the command.

Option	Description
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ReadOnlyWriteThrough	Specifies that Read Only/Write Through mode is requested. No input required.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.

Properties

Below are the properties that can be modified.

Property	Description
--Mode	1 to transition to read only mode, 2 to transition to write through mode.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

This command is only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Return Data

This command will send and return the status of the NVMe set Read Only/Write Through mode. See the following section for the corresponding get feature: Show NVMe Read Only/Write Through Mode Information *on page 80*

Examples

```
> sst set --ssd 1 --OCPReadOnlyWriteMode --mode 1
Set Mode successful. Completed successfully.
```

4.2.11 Set OCP Error Injection

The set OCPErrorInjection command allows the user to forcibly inject errors into the device.

Note: Injecting error could result in unrecoverable data loss. Proceed with caution.
Note: For more details, please check OCP documenation

Syntax

```
set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --OCPErrorInjection [--ErrorInjectionEntries ((tilde separated entry list))] [--File (path to input file)]
```

```
ShowErrorInjection:

show [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --ocperrorin-
jection
```

Options

Option	Description
[-help|-h]	Displays help for the command.
[-output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--OCPErrorInjection	Specifies that error injection set feature is requested. No input required.
[--ssd (Index|SerialNum-ber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.

Properties

Below are the properties that can be modified.

Property	Description
--ErrorInjectionEntries	A tilde separated list of error injection entries. See the Open Compute Project NVMe Cloud SSD Specification for more details. **Note:** Each entry shall be formatted in a specific way. Each item in the entry is separated by a period (.). The general format is as follows: • First item is the injection enable attribute (0 or 1) • The second item is the single instance attribute (0 or 1) • The third item is the error injection type (always interpreted as hex value) • The fourth entry is a 28-byte hex value indicating the type specific data. A user doesn't have to specify all 28-bytes. If less than 28-bytes are specified, then 0's are prepended. Example: One error ErrorInjectionEntries: 1.0.0x3.0x44 Multiple ErrorInjectionEntries: 1.0.0x3.0x44~0.1.0x12.0x3D~1.1.0x3.0xA16E **Note:** ErrorInjectionEntries properties and ErrorInjectionEntryFile are mutually exclusive.
File	Specifies an XML file that contains the error injection info data. This option serves to streamline the injection formatting (which is cumbersome). **Note:** ErrorInjectionEntries properties and ErrorInjectionEntryFile are mutually exclusive.

Limitations

This command is only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Return Data

This command will send and return the status of the NVMe set error injections. See the following section for the corresponding get feature: Show OCP Error Injection Information *on page 81*

Flow

Get Capabilities:

To properly execute OPC error injection command, use get feature with select capabilities to get number of errors supported. Capabilities shows how many errors can be injected at once.

```
sst show --ssd [index] --getfeature OCPErrorInjection --select capabilities
```

Injecting Error

SST supports two command Types:

- Panic (OCP)
- Generic

Settings:

Error Injection data structure consists of 32 bytes to specify 4 settings for the given injection. The first byte (lower 2 bits) specify Error Entry Flags:

Breakdown:

1. Single Instance
2. Error Injection Enable
3. Injection Type (2 bytes)
4. Error Injection Type specific definition (28 bytes)

Command Type: Panic

For panic command type injections SST internally sets Single Instance and Error Injection Enable to 1.

Only 2 fields needs to be provided as parameters:

- Injection Type (values from 1h-Bh are allowed as per OCP Spec)
- NRTDP (**N**umber of **R**eads to **T**rigger **D**evice **P**anic)

Example:

Set the type to 3 (PLP Defect) and Trigger Counter to 7. Or for Incomplete Shutdown type

```
sst set --ssd 2 --OCPErrorInjection --ErrorInjectionEntries 3.7
```

Set hexadecimal value of B, because the first argument is treated as hex in SST,

Note: Setting 11 will be rejected, because it corresponds to decimal 17

```
sst set --ssd 2 --OCPErrorInjection --ErrorInjectionEntries B.7
```

Multiple injections from one command line by tilde separated inputs:

```
sst set --ssd 2 --OCPErrorInjection --ErrorInjectionEntries 3.7~4.7
```

So, in above command we inject 2 errors: type 3 and type 4. Both have same counter of 7.

Warning for **NRTDP**

For OCP Panic type injections, setting the read counter to 0 may trigger the injection instantly and cause drive to assert instantly (depending on drive specs)

By default, SST will detect if Read counter is 0 and ask for user permission before proceeding. User can choose to Accept(1), Skip(2) or Abort(3)

To bypass user prompt, --force option can be provided in the command line:

```
sst set --force --ssd 1 --OCPErrorInjection --ErrorInjectionEntries 3.0
```

Command Type: Generic

For generic command type injections all 4 fields must be specified and the last argument must be full 28 bytes, meaning 56 characters, here is an example (that mimics Panic 3.1):

```
sst set --ssd 2 --OCPErrorInjection --ErrorInjectionEntries
 1.1.3.01000000000000000000000000000000000000000000000000000000
```

Note: For generic command type injections it is user's responsibility to specify all fields according to the specific device specifications.

File (XML) Input :

Beside specifying error injection(s) on the command line, SST allows also the injection(s) to be specified in input XML file, here is an example:

```
sst set --ssd 2 --OCPErrorInjection --file ErrorInjectionTest.xml
```

Following xml sample injects 4 errors. 3 Panic and 1 Generic:

Note: Panic types require only 2 inputs and generic types require all 4 inputs.

```
<?xml version="1.0" encoding="utf - 8"?>
<Object name = "Entry List" >
 <Object name = "Entry" value = "Panic">
   <Property name = "Type" value = "1"/>
   <Property name = "Number of Reads to Trigger Device Panic" value = "5"/>
 </Object>
 <Object name = "Entry" value = "Panic">
   <Property name = "Type" value = "2"/>
   <Property name = "Number of Reads to Trigger Device Panic" value = "6"/>
 </Object>
```

```
<Object name = "Entry" value = "Generic">
  <Property name = "Error Injection Enable" value = "1"/>
  <Property name = "Single Instance" value = "1"/>
  <Property name = "Type" value = "3"/>
  <Property name = "Type Specific Data" value =
"07000000000000000000000000000000000000000000000000000000"/>
</Object>
<Object name = "Entry" value = "Panic">
  <Property name = "Type" value = "4"/>
  <Property name = "Number of Reads to Trigger Device Panic" value = "8"/>
</Object>
</Object>
</xml>
```

Injecting with File option:

```
sst set --ssd 1 --OCPErrorinjection --File errorinjection.xml
```

Injecting with entries option:

```
sst set --ssd 1 --ocperrorinjection --errorinjectionentries 1.0.0x3.0x44~0.1.0x12.0x3D~1.1.0x3.0xA16E
```

Clear Pending Error:

To clear pending errors from the device, execute OCPErrorInjection command with ErrorInjectionEntries option set to clear.

Example:

```
sst set --ssd 2 --OCPErrorInjection --ErrorInjectionEntries clear
```

4.2.12 Clear PCIe Correctable

The set -PCIeCorrectable command sends a set feature command with the specified feature id (FID) for SSDs. Used to clear the PCIe correctable counter.

Only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Syntax

```
sst set [--help|-h] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --PCIeCor-
rectable --ClearCounter (true)
```

Option

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--PCIeCorrectable	Specifies that clear PCIe correctable counter is requested. No input required.
[--ssd (Index|SerialNumber|PhysicalPath)]	(Optional) Restricts output to specific SSD by supplying the SSD Index or Serial Number.

Properties

Below are the properties that can be modified.

Property	Description
ClearCounter	Set to 'true' to clear the counter.

Limitations

To run this command option, the specified SSD(s) must be manageable by the host software. The specified device must be an NVMe SSD.

This command is only supported on NVMe devices that support the NVMe Cloud SSD Specification from the Open Compute Project.

Return Data

This command will send and return the status of the NVMe clear PCIe correctable counter.

Examples

```
> sst set --ssd 1 --PCIeCorrectable --ClearCounter True
Set ClearCounter successful. Completed successfully.
```

4.2.13 Drive Scan

Scan the drive for Data Integrity, Read Scans, or Logs.

Note: Log scan output will be saved to the output/TIME_STAMP directory relative to the directory in which the command was run unless overridden by the DirectoryPath property.

Syntax

```
start [--help|-h] [--output|-o (text|nvmxml|json)] --scan [(DataIntegrity|ReadScan|Logs)] [--ssd
 [(Index|SerialNumber|PhysicalPath)]] [--IncludeOS (true|false)] [--FullScan (true|false)] [--Path
 (drive letter)] [--DirectoryPath (file path)] [--IncludeSystemInfo (true|false)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.

Option	Description
[--output|-o (text | nvmxml | json)]	Change the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	(Required) A specific SSD selected by supplying the SSD Index or Serial Number must be provided.
--scan [(DataIntegrity|ReadScan|Logs)]	(Required) Command to scan information on the drive. Options: • DataIntegrity • ReadScan • Logs

Properties

Property	Description
[IncludeOS = (true|false)]	(Optional) Scan OS partition and/or drive as part of scan.
[FullScan = (true|false)]	(Optional) Should the command perform Full or Quick scan.
[Path = (drive letter)]	(Optional) Path to drive partition to scan. Only applicable for DataIntegrity
[DirectoryPath = (file path)]	(Optional) Specify path where drive and system logs should be saved Default is "output/" in current directory.
[IncludeSystemInfo = (true|false)]	(Optional) Should system information be included in the scan.

Limitations

To successfully execute this command, the caller must have the appropriate privileges and the specified SSD must be manageable by the host software.

Return Data

This will return status of the command.

Examples

```
> - Scan Results -
sst start --scan ReadScan --ssd 1
- StoreLogs -
Result : Completed successfully.
```

4.2.14 Read System Snapshot

Read the system snapshot from the device and save it to a binary file.

Syntax

```
Dump [--help|-h] [-destination (path)] [--output|-o (text|nvmxml|json)] --ssd (Index|SerialNumber|PhysicalPath) --SystemSnapshot
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--destination (path)]	Specify an alternate destination and file name for the output file.
[--output|-o (text | nvmxml | json)]	Change the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	(Required) A specific SSD selected by supplying the SSD Index or Serial Number must be provided.
--SystemSnapshot	(Required) Read the System Snapshot from the device.

Properties

No properties are applicable for this command.

Limitations

To successfully execute this command, the caller must have the appropriate privileges and the specified SSD must be manageable by the host software.

Return Data

This will return status of the command.

Examples

```
> sst dump --ssd 1 --systemsnapshot
SystemSnapshot_SerialNumber : Successfully written SystemSnapshot to SystemSnapshot_SerialNumber.bin
```

4.2.15 Over-provisioning

Over-provisioning is a process of increasing the spare area on a drive. Over-provisioning increases the performance and endurance of the drive.

Over-provisioning can be performed with Maximum LBA command. To over-provision, see Maximum LBA command in examples.

4.2.16 OCP Latency Monitor

The **Set OCP Latency Monitor** allows users to configure the OCP Latency Monitor settings on supported NVMe SSDs.

Syntax

```
Usage: sst set [--help, -h] [--output, -o text|nvmxml|json] --ssd Index|SerialNumber|PhysicalPath --
OCPLatencyMonitor [--Save 'true'|'false'] [--ActiveBucketTimerThreshold 16-bit hex] [--ActiveThresholdA
 8-bit hex] [--ActiveThresholdB 8-bit hex] [--ActiveThresholdC 8-bit hex] [--ActiveThresholdD 8-bit hex]
 [--ActiveLatencyConfiguration 16-bit hex] [--ActiveLatencyMinimumWindow 8-bit hex] [--DebugLogTrigger-
Enable 16-bit hex] [--DiscardDebugLog 8-bit hex] [--LatencyMonitorFeatureEnable 8-bit hex] [--File file]
```

Options

```
Options:
[--help, -h]                          Display help for the command.
[--output, -o]                        Change the output format. One of 'text', 'nvmxml' or 'json'.
 (text|nvmxml|json)
--OCPLatencyMonitor                   Latency Monitor feature.
[--Save]                              Enables the Save (SV) bit. Default is false. ('true'|'false')
  [--ActiveBucketTimerThreshold]        (16-bit hex)
  [--ActiveThresholdA]                  (8-bit hex)
  [--ActiveThresholdB]                  (8-bit hex)
  [--ActiveThresholdC]                  (8-bit hex)
  [--ActiveThresholdD]                  (8-bit hex)
  [--ActiveLatencyConfiguration]        (16-bit hex)
  [--ActiveLatencyMinimumWindow]        (8-bit hex)
  [--DebugLogTriggerEnable]             (16-bit hex)
  [--DiscardDebugLog]                   (8-bit hex)
  [--LatencyMonitorFeatureEnable]       (8-bit hex)
  [--File]                             Specify an json file to be used as input for a latency moni-
toring data structure entries.
{ "LatencyMonitoringDataStructureEntry" :
  {
      "ActiveBucketTimerThreshold" : "1",
      "ActiveThresholdA" : "0",
      "ActiveThresholdB" : "2",
      "ActiveThresholdC" : "1E",
      "ActiveThresholdD" : "2E",
      "ActiveLatencyConfiguration" : "0777",
      "ActiveLatencyMinimumWindow" : "0",
      "DebugLogTriggerEnable" : "0777",
      "DiscardDebugLog" : "0",
```

```
      "LatencyMonitorFeatureEnable" : "0"
  }
}
(file)
```

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	(Required) A specific SSD selected by supplying the SSD Index or Serial Number must be provided.

Usage

Update thru command line options:

To update via command line fields, provide value for each option.

Update thru JSON File:

Copy the JSON example displayed from the help command into a new file.

Example File

```
SetValueLatencyMonitor.json
{
    "LatencyMonitoringDataStructureEntry" :
    {
        "ActiveBucketTimerThreshold" : "1",
        "ActiveThresholdA" : "0",
        "ActiveThresholdB" : "2",
        "ActiveThresholdC" : "1E",
        "ActiveThresholdD" : "2E",
        "ActiveLatencyConfiguration" : "0777",
        "ActiveLatencyMinimumWindow" : "0",
        "DebugLogTriggerEnable" : "0777",
        "DiscardDebugLog" : "0",
        "LatencyMonitorFeatureEnable" : "0"
    }
  }
```

Modify the required values according to your test requirements and save the file.

Note: Ensure the JSON syntax remains valid after editing

After updating json file, run set command with file parameter

```
sst set --ssd <Index> --OCPLatencyMonitor --file <path>\SetValueLatencyMonitor.json
```

Result:

```
sst set --ssd <Index> --OCPLatencyMonitor --File "/path/SetValueLatencyMonitor.json"

 - NVMeFeatures BTCP351404DL3 -

Status : Set OCPLatencyMonitor successful.
```

Verify the Results:

```
sst show --ssd <Index> --nvmelog OCPLatencyMonitor
```

```
sst show --ssd <Index> --nvmelog OCPLatencyMonitor

Serial Number : SERIALNUMBER123
- NVMeGetLog -

Log ID : 0xC3
- OCP Latency Monitor Log -

Reserved (1) : 0x0 (0)
Active Bucket Timer : 0x4F (79)
Active Bucket Timer Threshold : 0x7E0 (2016)
Active Threshold A : 0x5 (5)
...
```

4.3 Configure Namespaces

4.3.1 Create a Namespace

Create a namespace. Supported on NVMe 1.2+ devices. The NVMe controller of the device will determine the Namespace ID of the newly created namespace.

Syntax

```
create [--help|-h] [--output|-o (text|nvmxml|json)] --namespace --ssd (Index|SerialNumber|PhysicalPath)
 --Size (blocks) [--LBAFormat (0-NumLBAFormats)] [--ProtectionInformation (0|1)] [--MultiPathIoCapabilities (0|1)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Change the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	A specific SSD selected by supplying the SSD Index or Serial Number must be provided.
--namespace	The -namespace target is required. It specifies that a namespace is to be created.

Properties

Property	Description
Size = (blocks)	The size property is required. It specifies the size of the new namespace in terms of blocks.
[LBAFormat = (0-NumL-BAFormats)]	The LBAFormat property is optional. By default an LBAFormat of 0 will be used. Valid options are 0 to Number of supported LBA Formats specified in the Identify Controller structure. See the NumL-BAFormats from show --ssd. The main thing this value determines is the formatted sector size. **Note:** You cannot have different namespaces with different LBA sector sizes.
[ProtectionInformation = (0|1)]	The ProtectionInformation property is optional. By default a value of 0 will be used. 0 = protection information is disabled. 1 = protection information type 1 is used.
[MultiPathIoCapabilities = (0|1)]	The MultiPathIoCapabilities property is optional. By default a value of 1 will be used. 0 = Private namespace is created. 1 = shared namespace is created.

Limitations

To successfully execute this command, the caller must have the appropriate privileges and the specified SSD must be manageable by the host software.

Return Data

The CLI will return status of the command

Examples

Create a given namespace with a size of 100000 blocks.

```
create -namespace --ssd 2 --size 100000

- SSD SERIALNUMBER -

Status : create namespace successful.
```

Create a given namespace with a size of 100000 blocks, that is private and has protection type 1.

```
create -namespace --ssd 2 --size 100000 --MultiPathIoCapabilities 0 --ProtectionInformation 1

- SSD SERIALNUMBER -

Status : create namespace successful.
```

4.3.2 Attach a Namespace

Attach a namespace. May specify an NVMe controller ID using the -nvmecontrollerid target. Supported on NVMe 1.2+ devices.

Syntax

```
attach [--help|-h] [--output|-o (text|nvmxml|json)] --namespace (id) --ssd (Index|SerialNumber|Physical-Path) [--nvmecontroller (controller ID integer)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Change the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	A specific SSD selected by supplying the SSD Index or Serial Number must be provided.
--namespace (id)	The -namespace target is required and a valid namespace ID. It specifies that a namespace is to be attached.
[--nvmecontroller (controller ID integer)]	The -nvmecontroller target is optional. If used, a valid controller ID must be given. Used in the case of dual port drives in which a device may have more than one NVMe controller.

Properties

This command does not support any properties.

Limitations

To successfully execute this command, the caller must have the appropriate privileges and the specified SSD must be manageable by the host software.

Return Data

The CLI will return status of the command.

Examples

Attach namespace 1 on the device at index 2.

```
attach --namespace 1 --ssd 2

- SSD SERIALNUMBER -

Status : attach namespace successful.
```

4.3.3 Detach a Namespace

Detach a namespace. Supported on NVMe 1.2+ devices.

Syntax

```
detach [--help|-h] [--output|-o (text|nvmxml|json)] --namespace (id) --ssd (Index|SerialNumber|PhysicalPath) [--nvmecontroller (--controller ID integer)]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--output|-o (text | nvmxml | json)]	Change the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	(Required) A specific SSD selected by supplying the SSD Index or Serial Number must be provided.
--namespace (id)	(Required) The -namespace target is required and a valid namespace ID. It specifies that a namespace is to be detached.
[--nvmecontroller (controller ID integer)]	The -nvmecontroller target is optional. If used, a valid controller ID must be given. Used in the case of dual port drives in which a device may have more than one NVMe controller.

Properties

This command does not support any properties.

Limitations

To successfully execute this command, the caller must have the appropriate privileges and the specified SSD must be manageable by the host software.

Return Data

The CLI will return status of the command.

Examples

Detach namespace 1 on the device at index 2.

```
detach --namespace 1 --ssd 2

- SSD SERIALNUMBER -

Status : detach namespace successful.
```

4.3.4 Delete a Namespace

Delete a namespace. Supported on NVMe 1.2+ devices.

Syntax

```
delete [--help|-h] [--force|-f] [--output|-o (text|nvmxml|json)] --namespace (id) --ssd (Index|SerialNumber|PhysicalPath)
```

Options

Option	Description
[-help|-h]	Displays help for the command.
[--force|-f]]	The tool will display a prompt by default when invoking delete. Use this option to bypass the prompt. This option will also ignore partitions on the device.
[--output|-o (text | nvmxml | json)]	Change the format of the Return Data. Supported output options are: 'text' (Default), 'json', and 'nvmxml'.

Targets

Target	Description
--ssd (Index|SerialNum-ber|PhysicalPath)	(Required) A specific SSD selected by supplying the SSD Index or Serial Number must be provided.
--namespace (id)	The -namespace target is required and a valid namespace id must be provided. This selects which namespace to delete.

Properties

This command does not support any properties.

Limitations

To successfully execute this command, the caller must have the appropriate privileges and the specified SSD must be manageable by the host software.

Return Data

The CLI will return status of the command.

Examples

Delete namespace 1 on the device at index 2.

```
delete --namespace 1 --ssd 2

WARNING! You have selected to delete the namespace!
Proceed with the delete? (Y|N): y

- SSD SERIALNUMBER -

Status : delete namespace successful.
```

Use the -force option to bypass the prompt.

```
delete -f --namespace 1 --ssd 2

- SSD SERIALNUMBER -

Status : delete namespace successful.
```

4.4 Debug & Diagnostics

4.4.1 Tool Debug File

The SST saves to a debug file that contains detailed information on the tool execution. This file is very useful for the Tool Developers when having to debug issues. Whenever requesting assistance from the Tools team on a potential issue with the tool this file will be requested. See "Tool Configuration Settings" for more information on enabling the debug log.

If Log setting is enabled, the log is overwritten at each command execution.

The log contains details such as :

- How SST is communicating with the drive
- Command details being sent to drive
- Responses received from the driver/drives

4.4.2 Device Diagnostics and debug

To debug and perform diagnostic scans on devices, multiple options exist.

Check "Diagnostics, Logs, and Telemetry" section in SST help for full list of options available.

Debug logs command captures all supported relevant logs. See "Debug Logs package" section for more details.

Note: Some logs may not be available due to drive, OS and driver limitations

4.4.2.1 Debug logs Package

This command will dump logs from the device, gather system info and package all the logs to a zip file. It can be analyzed by Solidigm to debug the drive:

Syntax

```
sst dump[--help|-h] --debuglogs [-v] [--destination (filename)] [--output|-o (text|nvmxml|json)] [--ssd
 (Index|SerialNumber|PhysicalPath)] --type (‘all’|'list'|'identify'|’nvmelogs’|'system'|'telemetry')
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--destination (filename)]	Specifies a filename to save the dump data to. If -destination option is not given, default filename is assigned based on target and drive serial number.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: ‘text’ (Default), ‘json’, and ‘nvmxml’. This option does not affect the output in the binary file.
[-v]	If provided, verbose (detailed) output is displayed on the screen.

Targets

Target	Description
--ssd (Index|SerialNumber|PhysicalPath)	Dump the selected data from the given SSD.
--type	If provided, it allows user to generate specific log package. If not provided, default is all. • Options: a all b list c identify d nvmelogs e system f telemetry

Properties

This command does not support any properties.

Limitations

To run this command, the specified SSD must be manageable by the host software.

Only available on selected drives. Currently, supported by D7-PS1010 Series

Return Data

Binary data is saved to default file destination or if –destination option is given, output will be saved to given filename. Status of reading the binary data from the selected device, and saving it to file, is returned.

Examples

```
> sst dump --debuglogs --ssd 1
> sst dump --debuglogs -v --ssd 1
> sst dump --debuglogs --ssd 1 --type list
> sst dump --destination DebugPackage.zip --debuglogs -v --ssd SERIALNUMBER
> sst dump --debuglogs -v --ssd SERIALNUMBER --type nvmelogs
> sst dump --destination DebugNvmeLogs.zip --debuglogs -v --ssd SERIALNUMBER --type nvmelogs
```

4.4.2.2 Drive logs

Use dump command to dump drive logs. Some Logs available::

- nLog
- Event Log
- Assert Log
- Telemetry Log

Syntax

```
dump[-help|-h] [--destination (filename)] [--output|-o (text|nvmxml|json)] [--ssd (Index|SerialNumber|PhysicalPath)] --nlog
```

```
dump[-help|-h] [--destination (filename)] [--output|-o (text|nvmxml|json)] [--ssd (Index|SerialNum-
ber|PhysicalPath)] --eventlog

dump[-help|-h] [--destination (filename)] [--output|-o (text|nvmxml|json)] [--ssd (Index|SerialNum-
ber|PhysicalPath)] --assertlog

dump --destination <output binary> --ssd <index|serial|physicalpath> --telemetrylog

dump[--help|-h] [--destination (filename)] [--output|-o (text|nvmxml|json)] [--ssd (Index|SerialNum-
ber|PhysicalPath)] --persistenteventlog (‘read’|’release’) [--NewContext [(‘true’|’false’)]]
```

Options

Option	Description
[--help|-h]	Displays help for the command.
[--destination (filename)]	Specifies a filename to save the dump data to. If -destination option is not given, default filename is assigned based on target and drive serial number.
[--output|-o (text | nvmxml | json)]	Changes the format of the Return Data. Supported output options are: ‘text’ (Default), ‘json’, and ‘nvmxml’. This option does not affect the output in the binary file.

Targets

Target	Description
--ssd (Index|SerialNum-ber|PhysicalPath)	Dump the selected data from the given SSD.
--nlog	Read the nlog binary data from the device and save it to binary file.
--eventlog	Read the event log binary data from the device and save it to binary file.
--assertlog	Read the Assert log binary data from the device and save it to binary file.
--telemetrylog	Read the telemetry log binary data from the device and save it to binary file
--persistenteventlog (‘read’|’release’)	Read the persistent event log binary data from the current context, create a new context, or release the current context

Properties

This command does not support any properties.

Limitations

To run this command, the specified SSD must be manageable by the host software.

Telemetry is only available on selected drives.

Return Data

Binary data is saved to default file destination or if –destination option is given, output will be saved to given filename. Status of reading the binary data from the selected device, and saving it to file, is returned.

Examples

Read the nlog binary from all attached SSDs. Save to default files.

```
> dump –nlog
Nlog_CVF85156007H400AGN-2 : Successfully written Nlog data to Nlog_CVF85156007H400AGN-2.bin
Nlog_CVF85156007H400AGN-1 : Successfully written Nlog data to Nlog_CVF85156007H400AGN-1.bin
Nlog_BTWL238602AM800DGN : Successfully written Nlog data to Nlog_BTWL238602AM800DGN.bin
```

Read 600 sectors the GPL at address 0xDF, Page Number 0 and save it to binary file: gpl.bin.

```
> dump –destination gpl.bin –-ssd 1 --gpl 0xDF --PageNum 0 --SectorCount 600

GPL_BTWL238602A
M800DGN : Successfully written GPL data to gpl.bin
```

Extract Telemetry log to file telelmetry_data.bin

```
sst.exe dump --destination telemetry_data.bin --ssd 1 --telemetrylog
```

Read Persistent event log data from the current context

```
sst.exe dump --destination PEL_data.bin --ssd 1 --persistenteventlog read
```

Establish a new persistent event log context and read from it

```
sst.exe dump --destination PEL_data.bin --ssd 1 --persistenteventlog read --NewContext true
```

Release the current persistent event log context (does not read or output any data)

```
sst.exe dump --destination PEL_data.bin --ssd 1 --persistenteventlog release
```

5 Response Codes

The following table lists some of most common error and status codes that are returned from the SST. The first column lists the numeric value of the error/status code returned by the tool. In Windows, to display the numeric return value, type the following at the command prompt after running the tool:

```
>echo %errorlevel%
```

Code	Description
0	Completed successfully.
1	Failed to load the TDK Interface library.
2	An error occurred with interacting with the TDK Interface Library.
3	An error was returned from the TDK Interface when executing the given CLI functionality.
4	Encountered a read file error.
5	Encountered a write file error.
6	Invalid Boolean values were given.
7	Invalid property given.
8	Invalid CLI argument given.