I TOSHIBA

TOSHIBA Drive Common Tool (TSBDRV)

User Manual (2.47)

Toshiba Electronic Devices & Storage Corporation (TDSC)

Revision History

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0.6	2016/05/02	Diagnostic updates
0.7	2016/05/01	Updated End-User License Agreement
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2.5	2019/05/31	Feature Update 11.1 Experimental Release
2.6	2019/07/25	Diagnostic Test Update, OSNTF Tests Support Update
2.7	2019/10/24	Feature updates 12.0 Experimental Release
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2.27	2021/11/30	1. Section 5.1 Version updated for example. 2. Section 5.5.3 Smart attr updated for example. 3. Section 5.12.5 Mode setfield command newly added.
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2.32	2022/09/02	1. Section 5.18.3 Mediacache flush update for Note section
2.33	2023/02/28	1. Copyright updated 2. Section 5.11.4, Logs vendorlog updated for MFM mode 3. Section 7, Return code updated to add 2 new codes
2.34	2023/03/31	1. Section 5.15 updated with new optional tests. 2. Section 5.15.1 updated with new Json parameters.
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1. Introduction

TOSHIBA Drive Common Tool (TSBDRV) is a comprehensive tool to manage TOSHIBA drives. It provides a Command Line Interface (CLI) to perform several management operations on the TOSHIBA Drives. Currently this tool supports following drive configurations:

- SATA drives behind SAS controllers.
- SATA drives behind SATA controllers.
- SATA drives with CSMI interfaces.
- SATA drives behind selected RAID interfaces.
- SAS drives behind SAS controllers.
- SAS drives behind selected RAID interfaces.
- External USB drives (SATA).

Note

1. TSBDRV Tool doesn't restrict any command for the drives behind RAID controller. However, behaviour of the tool is in-deterministic for IO commands for the drives behind RAID controller.
2. TSBDRV Tool supports SATA and SAS drives behind below RAID controllers:
   - Broadcom (LSI) SAS 2.0 series (92XX), SAS2 2208, SAS3 3008, 3108, 3408, 3508, 3416, 3516.
   - Adaptec (PMC) ASR 78XX series, Adaptec SmartRAID 3152-8i.
   - Marvell 1475 Controller.
3. TSBDRV Tool supports both SATA and SAS drives for ARM64 platform for below RAID controllers:
   - Broadcom (LSI) MegaRAID (MR) and Initiator-Target (IT).
4. Diagtest and other commands which involves IO operations are not supported for RAID volumes (Device ID starting with raid_*). It is recommended to use Physical device ID (e.g: sda, sdc etc) for complete support of commands.
5. LSI IT RAID controllers are not supported in Windows environment.
6. Drives behind RAID controller are not supported in FreeBSD environment.
7. SAS drives are not supported in FreeBSD environment.
8. For command support details on various Operating system, refer Section-4: List of CLI Commands
9. Behavior of the tool is in-deterministic for environment where multiple RAID controllers are connected.
10. It is not recommended to use LSI9300 RAID controller with firmware version v15.00.00.00 and v16.00.10.
11. TSBDRV Tool supports both SATA and SAS drives for ESXI 7.0 platform for below RAID controllers:
    - Broadcom (LSI) MegaRAID (MR-7).

2. Overview

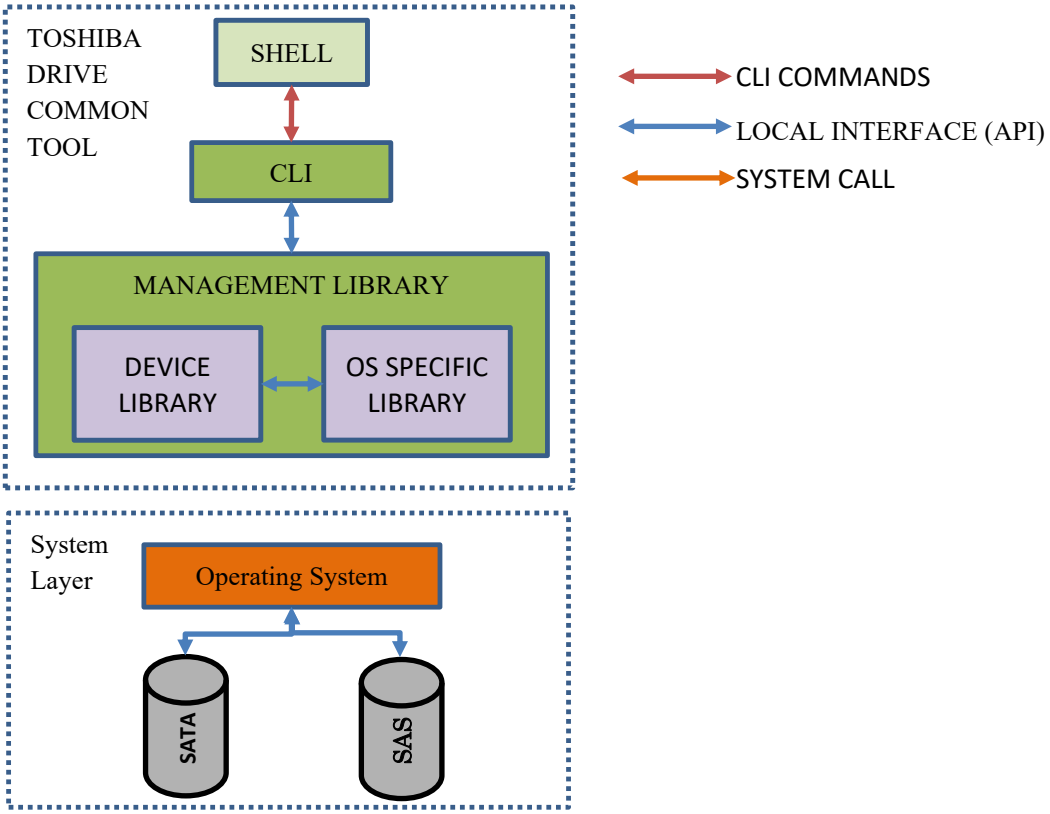
TOSHIBA Drive Common Tool (TSBDRV) CLI supports commands to list and manage all TOSHIBA drives attached to the system. With the help of this CLI tool, we can download firmware to TOSHIBA SAS/SATA drives that are attached to the SAS/SATA Controllers. Also, we can perform following operations:

- List all the drives and query on those drives.
- Firmware update on drives.
- Package/unpackage firmware image.
- Read SMART, events and statistics information from drives.
- Perform secure erase.
- Manage non-volatile cache.
- Manage user-capacity/maximum accessible LBA from drive.
- Read device log pages.
- Execute Self-tests and view results.
- Perform device diagnostic tests via Ios like write, read, lbatest, unit-test (Stop/Start) & error duplication test.
- Manage device features (Power State, Temperature and other thresholds, Drive Cache etc.).
- Perform device format and erase operations.
- Collect device dump log in binary format from supported devices.
- Perform device format and supports polling to know the status of the format operation.

2.1 Software Structure of TOSHIBA Drive Common Tool

Below figure gives an overview of host software in the TOSHIBA Drive Common Tool stack.

Figure 2-1 Host software for managing TOSHIBA drives.



3. TSBDRV CLI Overview & its Usage

TOSHIBA TSBDRV tool runs on Windows, Linux, FreeBSD & VMware ESXI operating systems.

The primary user interface for this tool is a Command Line Interface (CLI). After installing the software on Windows/Linux, this CLI can be executed from the command Prompt/Shell. CLI executable can be found in the installed directory.

The tool needs to be run with Administrative/Super User privileges.

Descriptive log files for usage are generated in below directories for the respective operating systems:

- On Windows, 'TSBDRV' named sub-folder at "%PROGRAMDATA%\toshiba\" path.
- On Linux/FreeBSD/VMware ESXI, sub-directory namely 'tsbdrv' at "/var/log/toshiba/" path.

Note

1. TSBDRV executable can be invoked from any path as
   a. On Windows, installer modifies the 'PATH' environment variable.
   b. On Linux, installer creates the symbolic link of executables and libraries on standard path.
2. Tool doesn't clear the log files during installation/uninstallation/processing. User should clean the log directory manually or via other means (e.g. periodic scripts) as and when required.
3. This log path was different in and before 02.00.1902 (Windows "%PROGRAMDATA%\TSBDRV", in Linux "/var/log/tsbdrv")
4. If tool is upgraded from version 02.00.1902, then for user benefit (in case user need older log files), log files created on older log path will not be cleaned by tool during installation or execution. User should clean the older log files manually if those are not required.

3.1 Command Parameter Format

All commands in TOSHIBA TSBDRV CLI conform to the following mechanism for specification of command parameters.

Table 3-1 General syntax for the CLI command parameters.

Parameter Syntax	Parameter Description
<x>	A parameter enclosed within angular brackets <> is mandatory.
[x]	A parameter enclosed within square brackets [] is optional flag.
[x <v>]	A parameter enclosed within square brackets [] containing angular brackets <> is optional parameter value pair.

The following special characters are used in the syntax to indicate certain behavior but they are not part of the command syntax:

Square [] and angular <> brackets - Used to differentiate between optional and mandatory parameters.

"|" character indicates an option available to the user to choose between short and long options. Example: [-h|--help]

3.2 TOSHIBA TSBDRV CLI Usage

All commands which are supported by the TOSHIBA TSBDRV CLI adhere to the following syntax:

```
tsbdrv <cmd> [subcmd] [arglist]
```

- Mandatory arguments mentioned in <> brackets should be placed before the optional arguments in explicit sequence. These are indicated as shown below:

  POS-PARAM → Mandatory arguments

- Optional arguments mentioned in [] brackets should be qualified with a switch. Order of optional parameters is not significant. Optional arguments are indicated as shown below:

  OPT-PARAM → Optional arguments

3.3 Common TSBDRV CLI Options

3.3.1 Help Option

The TSBDRV CLI help is displayed in hierarchical order.

For example, below command displays all the supported commands.

```
tsbdrv [-h | --help]
```

Use below command to display all supported sub-commands along with their argument list and supported values.

```
tsbdrv <cmd> [-h | --help]
```

Note

1. Every command/sub-command contains a hidden option as -h|--help.
2. If `-h|--help` is specified for any command, then all other options are ignored and help for the command/sub-command is displayed.

Synopsis

```
tsbdrv [-h]
```

Parameters

Argument	Description	Mandatory/ Optional	Default Value
-h, --help	Help option to list down all commands available in CLI	-	-

Output

```
Usage: tsbdrv <command> [sub-command] [arglist]
       By default the following optional parameters are specified: <option>
<value>
```

Command	Description
version	Displays current product version
query	Displays information about all the drives
identify	Displays identify data of device
firmware	Manages device firmware
smart	Displays SMART information
secerase	Performs secure erase
format	Performs device format
cache	Manages Non-Volatile cache related operations
feature	Manages device feature set/get operations
maxlba	Manages maximum user accessible space on device
logs	Reads log pages and prints the Hex dump
mode	Manages SCSI mode parameters
selftest	Executes SMART self-test on device
diagtest	Performs device diagnostic test via IO
osntf	On-site NTF test for SATA and SCSI devices
devdump	Collects device dump log
decodelog	Analyzes FE log data and judges the drive health
mediacache/mc	Performs media cache management commands
logdiag	Performs log diagnostics and produces 64-bit output
genfile	Generates config file
analyze	Analyzes specified parameter of drive

To view help for a specific command/sub-command, type

```
tsbdrv <command> -h
tsbdrv <command> <sub-command> -h
```

or

```
tsbdrv <command> --help
tsbdrv <command> <sub-command> --help
```

3.3.2 Silent Option

Silent option is used to execute commands in silent/unattended mode. When this option is specified, CLI does not wait for any input from the user. Check the return value to determine the status of command completion. This option is available only for few commands.

Syntax is as follows:

```
tsbdrv <cmd> <sub-command> <arglist> [--silent | -s]
```

3.3.3 Force Option

Force option is used to execute commands even in adverse condition/result. When this option is not specified, CLI aborts the command with error. Check the return value to determine the reason of abort. This option is available only for few commands.

Syntax is as follows:

```
tsbdrv <cmd> <sub-command> <arglist> [--force | -f]
```

3.3.4 Exclusive Option

Exclusive option is used to execute commands by locking the device operations exclusively by any command. This option is available with the selected commands (see respective help section of command).

Syntax is as follows:

```
tsbdrv <cmd> <sub-command> <arglist> [--exclusive | -x]

tsbdrv <cmd> <sub-command> <arglist> [--no_exclusive | -nx]
```

Note

1. This creates a lock directory on host machine. This lock directory is not cleared during uninstallation. User should clean the lock directory manually.
2. Lock directory path:
   On Windows: %PROGRAMDATA%\TOSHIBA\TSBDRV\lock
   On Linux: /var/lock/toshiba/tsbdrv
3. If any command started with '–x' option, then other tsbdrv operation started on same device will abort with error "`TSBERR166`". This lock is applicable only to lock the TSBDRV CLI.
4. Few commands enforce the 'exclusive' operation. Exclusive operation can be disabled using -nx/--no_exclusive (if option is available with command).

3.3.5 Signal Handling

TSBDRV handle 3 system signals:

- Interrupt (SIGINT)
- Terminate (SIGTERM)
- Abort (SIGABRT)

These signals are caught by TSBDRV as and when raised but the caught signal is processed when TSBDRV is not communicating with device via some synchronous command.

TSBDRV will not cancel or rollback any previous synchronous/asynchronous command issued to device prior to signal processing. This fact is asserted by following statement after signal handling

```
"Command already initiated on device will not be aborted."
```

3.3.6 User Confirmation

User confirmation may be required for few steps/commands. Following convention is used while performing user confirmation.

[y/N] and [Y/n] represents the different default behavior i.e. when 'ENTER' is pressed without any input.

- [y/N] indicates that CAPITALIZED N i.e. NO is the default value if only 'ENTER' is pressed.
- [Y/n] indicates that CAPITALIZED Y i.e. YES is the default value if only 'ENTER' is pressed.

This behavior was kept on-purpose depending on the requirement of the specific command at specific stage.

4. List of CLI Commands

This section provides a list of supported commands on different platforms.

Table 4-1 List of supported commands

Commands	x64							ARM64	
	Windows		Linux		FBSD	VMware ESXI		Linux	
	SATA	SCSI	SATA	SCSI	SATA	SATA	SCSI	SATA	SCSI
version	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ready[3]	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
devlist[3]	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
powerport[3]	Yes	Yes	Yes	Yes	No	No	No	No	No
query	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
identify/inquiry	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
firmware status	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
firmware download	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
firmware activate	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
firmware package	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
firmware unpackage	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
firmware pkginfo	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
smart info	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
smart errors	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
smart attr	Yes	No	Yes	No	No	No	No	Yes	No
secerase	Yes[1]	No	Yes[1]	Yes	No	No	No	Yes[1]	Yes
format start	No	Yes	No	Yes	No	No	No	No	Yes
format status	No	Yes	No	Yes	No	No	No	No	Yes
format fast	No	Yes	No	Yes	No	No	No	No	Yes
cache status	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
cache enable	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
cache disable	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
cache flush	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
feature list	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
feature get	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
feature set	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
maxlba get	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
maxlba set	Yes[1]	Yes	Yes[1]	Yes	No	No	No	Yes[1]	Yes
maxlba restore	Yes[1]	Yes	Yes[1]	Yes	No	No	No	Yes[1]	Yes
logs directory	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
logs read	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
logs internal	Yes[2]	Yes[2]	Yes[2]	Yes[2]	No	No	No	Yes[2]	Yes[2]
logs vendorlog	Yes[2]	Yes[2]	Yes[2]	Yes[2]	Yes	No	No	Yes[2]	Yes[2]

mode directory	No	Yes	No	Yes	No	No	No	No	Yes
mode desc	No	Yes	No	Yes	No	No	No	No	Yes
mode get	No	Yes	No	Yes	No	No	No	No	Yes
mode set	No	Yes	No	Yes	No	No	No	No	Yes
mode setfield	No	Yes	No	Yes	No	No	No	No	Yes
selftest short	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
selftest long	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
selftest status	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
selftest abort	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
selftest result	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest unittest	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest read	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest write	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest lbatest	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest errdup	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest errdupgenfile[3]	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest quick	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest standard	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest extended	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest ntf	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
diagtest custom	Yes[2]	No	Yes[2]	No	No	No	No	Yes[2]	No
uncorrect write	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
uncorrect recover	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
devdump	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
mediacache usage	Yes[2]	No	Yes[2]	No	No	No	No	Yes[2]	No
mediacache init	Yes[2]	No	Yes[2]	No	No	No	No	Yes[2]	No
mediacache flush	Yes[2]	No	Yes[2]	No	No	No	No	Yes[2]	No
binview[3]	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
raw[3]	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
logview[3]	Yes[2]	Yes[2]	Yes[2]	Yes[2]	No	No	No	Yes[2]	Yes[2]
decodelog	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
osntf genfile	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
osntf run	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
logdiag	Yes[2]	No	Yes[2]	No	No	No	No	Yes[2]	No
genfile	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
analyze drivehealth[3]	Yes[2]	Yes[2]	Yes[2]	Yes[2]	No	No	No	Yes[2]	Yes[2]
analyze smartntf	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
tcg discovery0	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
tcg status	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes

Note

1. Yes[1]: Command will fail for SATA devices behind SATA controller if device is in frozen state.
2. Yes[2]: Command is supported only for selective models.
3. Parallel operations like *'secerase', 'firmware download', 'selftest'* and *'maxlba'* on same device should be avoided (or executed with --exclusive option) as device may go in an inconsistent state or it may cause data loss due to this.
4. Please note that the sample outputs are from various TOSHIBA Drives with varying configuration. All the features shown in the samples may/may not be available even on similar drives/models.

5. Usage of CLI Commands

5.1 Version

Version command is used to display current product version.

The syntax for this command is as follows:

```
tsbdrv version
```

Below table describes the parameters and sample usage of '*version'* command.

Argument	Description
Mandatory Parameter	
None	-
Optional Parameter	
-a, --about	Display version detail and supported features

Example 1 Current version display

```
tsbdrv version

        tsbdrv-toshiba version: 01-13.04.7095
```

Example 2 Detail version display

```
tsbdrv version -a

tsbdrv-toshiba version: 01-13.04.7095

Supported features:
       Deferred firmware download support
       Device data binary dump support
       Device diagnostic test support
       Device feature management support
       Device format support
       Device health analysis support
       Device identify data display support
       Device log pages read support
       Device maximum accessible LBA configuration support
       Device mode pages management support
       Device non-volatile cache management support
       Device secure erase support
       Device self-test support
       Firmware download support
       Firmware image file packaging support
       Media cache management support
       Offline log analysis for Macrosan
       SMART errors read support
       SMART information read support
       SMR device support
```

5.2 Query

Query command is used to list and display information of physical drives.

The syntax for this command is as follows:

```
tsbdrv query <devid> [-xml] [-j] [-vv] [-v]
```

Below table describes the parameters and sample usage of '*query*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier (Single device ID, all:query all devices, sata :query all SATA devices, sas:query all SAS devices)
Optional Parameter	
-xml, --xml	Display XML output
-j, --json	Display JSon output
-vv, --detail	Display detailed output
-v, --verbose	Display verbose output

Note

1. Query can be done on specific drive or all the drives or on specific device type as SATA or SAS by passing device type parameter to devid.
2. SATA or SAS keywords are not case-sensitive.
3. Drive information details for SATA and SAS differ for few fields according to feature supported by SATA/SAS specifications.
4. In case if any drive connected to the system is in BAD state or in Not-Ready state (standby state) then query all command may take more time to execute.

Example 1: List the drives in tabular format

```
tsbdrv query all

PHYSICAL-DRIVE  UNIT-STATUS FW-VER    MODEL-NUMBER
SERIAL-NUMBER                  TRANSPORT DEV-TYPE
-------------------------------------------------------------------------
-----------------------------------------------------
/dev/sda        Ready       DM05      MG03SCA300
13J0A01RFVL9                   SCSI      SCSI

/dev/sdb        Ready       JZEE6102  TOSHIBA THNSNJ960PCSZ
45MS10KGTM9W                   SCSI      ATA

/dev/sdc        Ready       FT1D      TOSHIBA MG04ACA600EY
Z4H1K00AF2MC                   ATA       ATA

/dev/sdd        Ready       CC45      ST1000DM003-1ER162
Z4Y6B6C6                       ATA       ATA

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: List the drives in XML format

```
tsbdrv query all -xml

<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
enable="1">
        <DRIVE>
                <PHYSICAL_DRIVE>/dev/sda</PHYSICAL_DRIVE>
                <UNIT_STATUS>Ready</UNIT_STATUS>
                <FW_VER>DM03</FW_VER>
                <MODEL_NUMBER>MG03SCA300</MODEL_NUMBER>
                <SERIAL_NUMBER>13J0A01RFVL9</SERIAL_NUMBER>
                <TRANSPORT_TYPE>SCSI</TRANSPORT_TYPE>
                <DEV_TYPE>SCSI</DEV_TYPE>
```



```
        </DRIVE>
        <DRIVE>
                <PHYSICAL_DRIVE>/dev/sdb</PHYSICAL_DRIVE>
                <UNIT_STATUS>Ready</UNIT_STATUS>
                <FW_VER>JZEE6102</FW_VER>
                <MODEL_NUMBER>TOSHIBA THNSNJ960PCSZ</MODEL_NUMBER>
                <SERIAL_NUMBER>45MS10KGTM9W</SERIAL_NUMBER>
                <TRANSPORT_TYPE>SCSI</TRANSPORT_TYPE>
                <DEV_TYPE>ATA</DEV_TYPE>
        </DRIVE>
        <DRIVE>
                <PHYSICAL_DRIVE>/dev/sdc</PHYSICAL_DRIVE>
                <UNIT_STATUS>Ready</UNIT_STATUS>
                <FW_VER>FT1D</FW_VER>
                <MODEL_NUMBER>TOSHIBA MG04ACA600EY</MODEL_NUMBER>
                <SERIAL_NUMBER>Z4H1K00AF2MC</SERIAL_NUMBER>
                <TRANSPORT_TYPE>ATA</TRANSPORT_TYPE>
                <DEV_TYPE>ATA</DEV_TYPE>
        </DRIVE>
        <DRIVE>
                <PHYSICAL_DRIVE>/dev/sdd</PHYSICAL_DRIVE>
                <UNIT_STATUS>Ready</UNIT_STATUS>
                <FW_VER>CC45</FW_VER>
                <MODEL_NUMBER>ST1000DM003-1ER162</MODEL_NUMBER>
                <SERIAL_NUMBER>Z4Y6B6C6</SERIAL_NUMBER>
                <TRANSPORT_TYPE>ATA</TRANSPORT_TYPE>
                <DEV_TYPE>ATA</DEV_TYPE>
        </DRIVE>
</tsbdrv>
```

Example 3: Drive information query on SATA Drive

```
tsbdrv query sdb -vv

/dev/sdb
------------------------------------------------------------------------
Firmware Version                                        : JZEE6102
Unit Status                                             : Ready
Model Number                                            : TOSHIBA
MG03SCA300
Serial Number                                           : 45MS10KGTM9W
Transport type                                          : SCSI
Device type                                             : ATA
Smart support                                           : Yes
Download Firmware support                               : Yes
Deferred Download Firmware support                      : Yes
Provision support                                       : Yes
Write Cache support                                     : Yes
Read Cache support                                      : Yes
Self-Test support                                       : Yes
Sense data reporting                                    : No
Security support                                        : Yes
Enhanced secure erase mode support                      : Yes
Download Firmware DMA support                           : Yes
Read Log DMA support                                    : Yes
------------------------------------------------------------------------

Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Drive information query on SAS Drive

```
tsbdrv query  sda -vv

/dev/sda
------------------------------------------------------------------------
Firmware Version                                        : DG08
Unit Status                                             : Ready
Model Number                                            : MG03SCA300
Serial Number                                           : 13J0A01RFVL9
```



```
    Transport type                                              : SCSI
    Device type                                                 : SCSI
    Smart support                                               : Yes
    Download Firmware support                                   : Yes
    Deferred Download Firmware support                          : Yes
    Provision support                                           : Yes
    Write Cache support                                         : Yes
    Read Cache support                                          : Yes
    Self-Test support                                           : Yes
    Sense data reporting                                        : Yes
    Secure erase support (Block Erase)                          : No
    Enhanced Secure erase support (Cryptographic Erase)         : No
    Read Log support                                            : Yes
    ------------------------------------------------------------------------

    Command return code: 0x00000000 [Command completed successfully]
```

Example 5: SATA device information in JSon format

```
tsbdrv query sdc -j

{
        “DrvCommonTool”:{
                "drive": [
                        {
                                "physical_drive" : "/dev/sdc",
                                "unit_status" : "Ready",
                                "fw_ver" : "JZEE6102",
                                "model_number" : "TOSHIBA THNSNJ960PCSZ",
                                "serial_number" : "45MS10JWTM9W",
                                "transport_type" : "ATA",
                                "dev_type" : "ATA"
                        }
                ]
        }
}
```

Example 6: List the drives in tabular format from iRST (SATA) setup.

```
tsbdrv query all

PHYSICAL-DRIVE  UNIT-STATUS FW-VER    MODEL-NUMBER
SERIAL-NUMBER                  TRANSPORT DEV-TYPE
------------------------------------------------------------------------------
-------------------------------------------------
PHYSICALDRIVE1  Not ready   1.0.      Raid 0 Volume
Volume0                        RAID      UNKNOWN
SCSI1:0         Ready       AV0A2C    TOSHIBA MQ01ACF032
264BW0PTT                      CSMI      ATA
SCSI1:3         Ready       AV0A2C    TOSHIBA MQ01ACF032
264BW0PVT                      CSMI      ATA
SCSI1:5         Not ready
CSMI      ATA
Command return code: 0x00000000 [Command completed successfully]
```

Example 7 : List the drives in tabular format by device type(sata)

```
tsbdrv query sata

PHYSICAL-DRIVE  UNIT-STATUS FW-VER    MODEL-NUMBER
SERIAL-NUMBER                  TRANSPORT DEV-TYPE
------------------------------------------------------------------------------
-------------------------------------------------
PHYSICALDRIVE0  Ready       GZ2D      TOSHIBA MG05ACA800EY
5662K002FYVD                   SCSI      ATA

PHYSICALDRIVE2  Ready       HDFD1C    TOSHIBA MQ02ABF050H
75ERC0M0T                      SCSI      ATA
```



```
PHYSICALDRIVE3  Ready       KC48      ST500DM002-1BD142
Z6EDDGXA                      ATA       ATA

PHYSICALDRIVE4  Ready       AUF01A    TOSHIBA MQ01ABD100H
147LC0KIT                     ATA       ATA
Command return code: 0x00000000 [Command completed successfully
```

Example 8 : List the drives in tabular format by device type(sas)

```
tsbdrv query sas

PHYSICAL-DRIVE  UNIT-STATUS FW-VER    MODEL-NUMBER
SERIAL-NUMBER                 TRANSPORT DEV-TYPE
-------------------------------------------------------------------------------
-------------------------------------------------
PHYSICALDRIVE1  Ready       DG08      MG03SCA100
84C0A09TFVN1                  SCSI      SCSI

Command return code: 0x00000000 [Command completed successfully]
```

Example 9: List the drives in tabular format from VMware ESXI (Linux) setup.

```
tsbdrv query all


PHYSICAL-DRIVE                UNIT-STATUS FW-VER    MODEL-NUMBER
SERIAL-NUMBER                  TRANSPORT DEV-TYPE
-------------------------------------------------------------------------------
-------------------------------------------------
naa.500003978b8047c9          Ready       FS5J      MG04ACA600A
17U3K10AFPFD                   SCSI      ATA


naa.5000039b3819a089          Ready       0105      MG09SCA18TE
X160A00TFHVH                   SCSI      SCSI


naa.5000039b981917d1          Ready       0105      MG09SCA12TE
42W0A004FTMH                   SCSI      SCSI


naa.5000039d48c81b18          Ready       4302      TOSHIBA MG10ADA400N
5420A003FCJL                   SCSI      ATA


naa.5000039d48c97791          Ready       4302      TOSHIBA MG10ADA400N
5480A00GFCJL                   SCSI      ATA


naa.5000039d48c9ed41          Ready       4302      TOSHIBA MG10ADA400N
54C0A009FCJL                   SCSI      ATA


naa.5000039d48c9ed4b          Ready       0803      MG10ADA400N
54C0A00KFCJL                   SCSI      ATA

Command return code: 0x00000000 [Command completed successfully]
```


5.3 Identify/ Inquiry

The command is used to display identify or inquiry data of device.

The syntax for this command is as follow:

```
tsbdrv identify <devid> [-xml] [-j] [-hex] [-v] [-e]
```

Below table describes the parameters and sample usage of '*identify/ inquiry*' command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-t, --terse	Display terse output
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output
-v, --verbose	Display verbose output
-e, --ext	Display Extended INQUIRY Data 0x86 VPD page (Applicable only for SCSI, it will be ignored for others)

Example 1: Identify SATA device data

```
tsbdrv identify sdd

/dev/sdd Identify data

Attribute
Value
------------------------------------------------------------------------------------------------------------
------------------
Non ATA device                                                                                          0
[0x0]
Incomplete response                                                                                     0
[0x0]
Specific configuration
51255 [0xc837]
Serial number
45DS109CT9UW
Firmware revision
JUGA0101
Model number
TOSHIBA THNSNJ512GCSU
Maximum logical sectors transferred per DRQ data block                                                 16
[0x10]
Trusted computing feature set options Bit 15                                                            0
[0x0]
Trusted computing feature set options Bit 14                                                            1
[0x1]
Trusted computing feature reserved options                                                              0
[0x0]
Trusted computing feature support                                                                       0
[0x0]
Standby timer specific to SAT-3 standard                                                                1
[0x1]
IORDY supported                                                                                         1
[0x1]
IORDY enabled                                                                                           1
[0x1]
LBA supported                                                                                           1
[0x1]
DMA supported                                                                                           1
[0x1]
Long physical sector alignment error reporting                                                          0
[0x0]
Minimum standby vendor specific time value supported                                                    0
[0x0]
Free-fall control sensitivity                                                                           0
[0x0]
Word 88 validity                                                                                        1
[0x1]
Words 64..70 validity                                                                                   1
[0x1]
BLOCK ERASE EXT command supported                                                                       1
[0x1]
OVERWRITE EXT command supported                                                                         0
[0x0]
```



```
CRYPTO SCRAMBLE EXT command supported                                   0
[0x0]
Sanitize feature set supported                                          1
[0x1]
Commands allowed during a sanitize operation as per SATA-3              0
[0x0]
SANITIZE ANTIFREEZE LOCK EXT command supported                          0
[0x0]
Multiple logical sector setting is valid                                1
[0x1]
Current logical sectors setting transferred per DRQ data block          16
[0x10]
User addressable logical sectors 28-bit                                 250
[0xfa]
Multi-word DMA mode 2 selected                                          0
[0x0]
Multi-word DMA mode 1 selected                                          0
[0x0]
Multi-word DMA mode 0 selected                                          0
[0x0]
Multi-word DMA mode 2 and below supported                               1
[0x1]
Multi-word DMA mode 1 and below supported                               1
[0x1]
Multi-word DMA mode 0 supported                                         1
[0x1]
PIO mode 3 and mode 4 supported                                         3
[0x3]
Minimum multi-word DMA transfer cycle time per word                     120
[0x78]
Recommended multi-word DMA transfer cycle time                          120
[0x78]
Minimum PIO transfer cycle time without flow control                    120
[0x78]
Minimum PIO transfer cycle time with IORDY                              120
[0x78]
Deterministic data in trimmed LBA range supported                       1
[0x1]
Long physical sector alignment error reporting control supported        0
[0x0]
READ BUFFER DMA supported                                               1
[0x1]
WRITE BUFFER DMA supported                                              1
[0x1]
DOWNLOAD MICROCODE DMA supported                                        1
[0x1]
Optional ATA device 28-bit commands supported disabled                  0
[0x0]
Trimmed LBA range returning zeroed data is supported                    1
[0x1]
All user data encryption active                                         0
[0x0]
Extended user addressable sectors supported                             0
[0x0]
All write cache non-volatile                                            0
[0x0]
Maximum queue depth                                                     31
[0x1f]
READ LOG DMA EXT equivalent to READ LOG EXT supported                   1
[0x1]
Device auto partial to slumber transition supported                     1
[0x1]
Host auto partial to slumber transition supported                       1
[0x1]
NCQ priority info supported                                             0
[0x0]
Unload while NCQ commands outstanding supported                         0
[0x0]
SATA PHY event counters log supported                                   1
[0x1]
Host initiated power management requests supported                      1
[0x1]
NCQ feature set supported                                               1
[0x1]
SATA gen3 signalling speed 6.0Gbps supported                            1
[0x1]
SATA gen2 signalling speed 3.0Gbps supported                            1
[0x1]
SATA gen1 signalling speed 1.5Gbps supported                            1
[0x1]
RECEIVE FPDMA QUEUED and SEND FPDMA QUEUED supported                    0
[0x0]
NCQ queue management supported                                          0
[0x0]
NCQ streaming supported                                                 0
[0x0]
Current negotiated serial ATA signal speed                              3
[0x3]
```



```
NCQ auto-sense supported                                                    0
[0x0]
Software settings preservation supported                                    1
[0x1]
Hardware feature control supported                                          0
[0x0]
In-order data delivery supported                                            0
[0x0]
Initiating power management supported                                       1
[0x1]
DMA setup auto-activation supported                                         1
[0x1]
Non-zero buffer offsets supported                                           0
[0x0]
Auto partial to slumber transitions enabled                                 0
[0x0]
Software settings preservation enabled                                      1
[0x1]
Hardware feature control is enabled                                         0
[0x0]
In-order data delivery enabled                                              0
[0x0]
Device initiated power management enabled                                   0
[0x0]
DMA setup auto-activation enabled                                           1
[0x1]
Non-zero buffer offsets enabled                                             0
[0x0]
ACS-3 supported                                                             0
[0x0]
ACS-2 supported                                                             1
[0x1]
ATA8-ACS supported                                                          1
[0x1]
ATA/ATAPI-7 supported                                                       1
[0x1]
ATA/ATAPI-6 supported                                                       1
[0x1]
ATA/ATAPI-5 supported                                                       1
[0x1]
Minor version number                                                        0
[0x0]
NOP command supported(Word82)                                               1
[0x1]
READ BUFFER command supported(Word82)                                       1
[0x1]
WRITE BUFFER command supported(Word82)                                      1
[0x1]
DEVICE RESET command supported                                              0
[0x0]
Read look-ahead supported                                                   1
[0x1]
Volatile write cache supported                                              1
[0x1]
PACKET feature set supported                                                0
[0x0]
Power management feature set supported(Word82)                              1
[0x1]
Security feature set supported                                              1
[0x1]
SMART feature set supported                                                 1
[0x1]
FLUSH CACHE EXT command supported(Word83)                                   1
[0x1]
FLUSH CACHE command supported)                                              1
[0x1]
DCO feature set supported                                                   1
[0x1]
The 48-bit address feature set supported(Word83)                            1
[0x1]
SET FEATURES subcommand  required to spin-up(Word83)                        0
[0x0]
PUIS feature set supported                                                  0
[0x0]
APM feature set supported                                                   1
[0x1]
DOWNLOAD MICROCODE command supported(Word83)                                1
[0x1]
IDLE IMMEDIATE command with UNLOAD FEATURE supported(Word84)                0
[0x0]
World wide name supported(Word84)                                           1
[0x1]
WRITE DMA FUA EXT and MULTIPLE FUA EXT command supported                    1
[0x1]
GPL feature set supported(Word84)                                           1
[0x1]
Streaming feature set supported                                             0
[0x0]
```



```
SMART self-test supported(Word84)                                                1
[0x1]
SMART error logging supported(Word84)                                            1
[0x1]
NOP command supported(Word85)                                                    1
[0x1]
READ BUFFER command supported(Word85)                                            1
[0x1]
WRITE BUFFER command supported(Word85)                                           1
[0x1]
DEVICE RESET command not supported                                               0
[0x0]
Read look-ahead enabled                                                          1
[0x1]
Volatile write cache enabled                                                     1
[0x1]
PACKET feature set not supported                                                 0
[0x0]
Power management feature set supported(Word85)                                   1
[0x1]
Security feature set enabled                                                     0
[0x0]
SMART feature set enabled                                                        1
[0x1]
Words 119..120 validity                                                          1
[0x1]
FLUSH CACHE EXT command supported(Word86)                                        1
[0x1]
FLUSH CACHE command supported                                                    1
[0x1]
The 48-bit address feature set supported(Word86)                                 1
[0x1]
SET FEATURES subcommand required to spin-up(Word86)                              0
[0x0]
PUIS feature set enabled                                                         0
[0x0]
APM feature set enabled                                                          1
[0x1]
DOWNLOAD MICROCODE command supported(Word86)                                     1
[0x1]
IDLE IMMEDIATE command with UNLOAD FEATURE supported(Word87)                    0
[0x0]
World wide name supported(Word87)                                                1
[0x1]
WRITE DMA FUA EXT and MULTIPLE FUA EXT commands supported                        1
[0x1]
GPL feature set supported(Word87)                                                1
[0x1]
Media serial number valid                                                        0
[0x0]
SMART self-test supported(Word87)                                                1
[0x1]
SMART error logging supported(Word87)                                            1
[0x1]
Ultra DMA mode 6 selected                                                        0
[0x0]
Ultra DMA mode 5 selected                                                        1
[0x1]
Ultra DMA mode 4 selected                                                        0
[0x0]
Ultra DMA mode 3 selected                                                        0
[0x0]
Ultra DMA mode 2 selected                                                        0
[0x0]
Ultra DMA mode 1 selected                                                        0
[0x0]
Ultra DMA mode 0 selected                                                        0
[0x0]
Ultra DMA mode 6 and below supported                                             0
[0x0]
Ultra DMA mode 5 and below supported                                             1
[0x1]
Ultra DMA mode 4 and below supported                                             1
[0x1]
Ultra DMA mode 3 and below supported                                             1
[0x1]
Ultra DMA mode 2 and below supported                                             1
[0x1]
Ultra DMA mode 1 and below supported                                             1
[0x1]
Ultra DMA mode 0 supported                                                       1
[0x1]
Extended time reported for normal erase mode                                     0
[0x0]
Time required for normal erase mode                                              1
[0x1]
Extended time reported for enhanced erase mode                                   0
[0x0]
```



```
Time required for enhanced erase mode                                   1
[0x1]
Current APM level value                                                 254
[0xfe]
Master password identifier
65534 [0xfffe]
Stream minimum request size                                             0
[0x0]
DMA streaming transfer time                                             0
[0x0]
DMA and PIO streaming access latency                                    0
[0x0]
Streaming performance granularity                                       0
[0x0]
User addressable logical sectors                                        250
[0xfa]
PIO streaming transfer time                                             0
[0x0]
Maximum blocks per DATA SET MANAGEMENT command                          8
[0x8]
Multiple logical sectors per physical sector                            0
[0x0]
Logical sector longer than 256 words                                    0
[0x0]
Logical sectors per physical sector                                     0
[0x0]
Inter-seek delay                                                        0
[0x0]
World wide name
17432044608943640576 [0xf1eb103680d95000]
Logical sector size                                                     0
[0x0]
DSN feature set supported                                               0
[0x0]
Accessible maximum address configuration feature set supported          0
[0x0]
EPC feature set supported                                               0
[0x0]
Sense data reporting feature set supported                              0
[0x0]
Free-fall control feature set supported                                 0
[0x0]
Download microcode mode 3 supported(Word119)                            1
[0x1]
READ and WRITE LOG DMA EXT commands supported                           1
[0x1]
WRITE UNCORRECTABLE EXT command supported(Word119)                      1
[0x1]
Write-Read-Verify feature set supported                                 0
[0x0]
DSN feature set enabled                                                 0
[0x0]
EPC feature set enabled                                                 0
[0x0]
Sense data reporting feature set enabled                                0
[0x0]
Free-fall control feature set enabled                                   0
[0x0]
Download microcode mode 3 supported(Word120)                            1
[0x1]
READ LOG DMA EXT command and WRITE LOG DMA EXT command supported        1
[0x1]
WRITE UNCORRECTABLE EXT command supported(Word120)                      1
[0x1]
Write-Read-Verify feature set enabled                                   0
[0x0]
Master password capability                                              0
[0x0]
Enhanced security erase supported                                       1
[0x1]
Security count expired                                                  0
[0x0]
Security frozen                                                         0
[0x0]
Security locked                                                         0
[0x0]
Security enabled                                                        0
[0x0]
Security supported                                                      1
[0x1]
Device nominal form factor                                              3
[0x3]
TRIM bit in the DATA SET MANAGEMENT command supported                   1
[0x1]
Additional product identifier                                           0
[0x0]
Current media serial number
SCT data tables command supported                                       1
[0x1]
```



```
SCT feature control command supported                                                                    1
[0x1]
SCT error recovery control command supported                                                             1
[0x1]
SCT write same command supported                                                                         1
[0x1]
SCT command transport supported                                                                          1
[0x1]
Logical sector offset within first physical sector                                                       0
[0x0]
Write-Read-Verify sector mode 3 count                                                                    0
[0x0]
Write-Read-Verify sector mode 2 count                                                                    0
[0x0]
Nominal media rotation rate                                                                              1
[0x1]
Write-Read-Verify feature set current mode                                                               0
[0x0]
Transport type                                                                                           1
[0x1]
SATA 30.1 supported                                                                                      1
[0x1]
SATA 3 supported                                                                                         1
[0x1]
SATA 20.6 supported                                                                                      1
[0x1]
SATA 20.5 supported                                                                                      1
[0x1]
SATA iI: extensions supported                                                                            1
[0x1]
SATA 1.0a supported                                                                                      1
[0x1]
ATA8-AST supported                                                                                       1
[0x1]
Transport minor version number                                                                           0
[0x0]
Extended number of user addressable sectors                                                              0
[0x0]
Minimum number of blocks per download microcode                                                          1
[0x1]
Maximum number of blocks per download microcode
65535 [0xffff]
Checksum                                                                                                 69
[0x45]
Checksum validity indicator                                                                              165
[0xa5]
-------------------------------------------------------------------------------------------------------------------
-------------------

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Identify SAS device in XML format

```
tsbdrv identify sdf -xml
<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
    <DRIVE>
        <PHYSICAL_DRIVE>/dev/sdf</PHYSICAL_DRIVE>
        <IDENTIFY_DATA>
            <FIELD>Peripheral qualifier</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>0</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Peripheral device type</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>0</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Removable medium</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>false</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Version</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>6</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Normal ACA supported</FIELD>
            <VALTYPE>bool</VALTYPE>
```



```
            <BOOLVALUE>false</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Hierarchical support</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>true</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Response data format</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>2</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Additional length</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>91</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>SCC supported</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>false</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Access controls coordinator</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>false</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Target port group supported</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>0</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Third-Party copy</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>false</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Protect</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>true</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Enclosure services</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>false</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Vendor specific byte6:bit5</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>false</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Multi port</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>true</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Command management model SAM-4 supported</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>true</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Vendor specific byte7:bit0</FIELD>
            <VALTYPE>bool</VALTYPE>
            <BOOLVALUE>false</BOOLVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>T10 vendor identification</FIELD>
```



```
            <VALTYPE>str</VALTYPE>
            <STRVALUE>TOSHIBA</STRVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Product identification</FIELD>
            <VALTYPE>str</VALTYPE>
            <STRVALUE>PX05SMB040</STRVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Product revision level</FIELD>
            <VALTYPE>str</VALTYPE>
            <STRVALUE>0101</STRVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Version descriptor 1</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>24588</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Version descriptor 2</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>40960</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Version descriptor 3</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>49157</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Version descriptor 4</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>6</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Version descriptor 5</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>0</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Version descriptor 6</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>0</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Version descriptor 7</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>0</NUMVALUE>
        </IDENTIFY_DATA>
        <IDENTIFY_DATA>
            <FIELD>Version descriptor 8</FIELD>
            <VALTYPE>num</VALTYPE>
            <NUMVALUE>0</NUMVALUE>
        </IDENTIFY_DATA>
    </DRIVE>
</tsbdrv>
```

Example 3: Identify data of device in hexadecimal format

```
tsbdrv identify sdd -hex
/dev/sdd Identify data Hexdump
-------------------------------------------------------
00000000: 40 00 00 00 37 c8 10 00 00 00 00 00 3f 00 00 00   '@...7.......?...'
00000010: 00 00 00 00 20 20 20 20 20 20 20 20 35 34 53 44   '....        54SD'
00000020: 30 31 43 39 39 54 57 55 00 00 00 00 00 00 55 4a   '01C99TWU......UJ'...
...
Output snippet
...
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 a5 45   '..............E'
-------------------------------------------------------
```



```
Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Identify data of device in JSon format

```
tsbdrv identify sdd -j
{
    “DrvCommonTool”: {
        "drive": [
            {
                "physical_drive": "/dev/sdd",
                "identify_data": [
                    {
                        "field": "Non ATA device",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Incomplete response",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Specific configuration",
                        "valtype": "num",
                        "numvalue": 51255
                    },
                    {
                        "field": "Serial number",
                        "valtype": "str",
                        "strvalue": "45DS109CT9UW"
                    },
                    {
                        "field": "Firmware revision",
                        "valtype": "str",
                        "strvalue": "JUGA0101"
                    },
                    {
                        "field": "Model number",
                        "valtype": "str",
                        "strvalue": "TOSHIBA THNSNJ512GCSU "
                    },
                    {
                        "field": "Maximum logical sectors transferred per DRQ data
block",
                        "valtype": "num",
                        "numvalue": 16
                    },
                    {
                        "field": "Trusted computing feature set options Bit 15",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Trusted computing feature set options Bit 14",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Trusted computing feature reserved options",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Trusted computing feature support",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Standby timer specific to SAT-3 standard",
```



```
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "IORDY supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "IORDY enabled",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "LBA supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "DMA supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Long physical sector alignment error reporting",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Minimum standby vendor specific time value
supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Free-fall control sensitivity",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Word 88 validity",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Words 64..70 validity",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "BLOCK ERASE EXT command supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "OVERWRITE EXT command supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "CRYPTO SCRAMBLE EXT command supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Sanitize feature set supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
```



```
                    {
                        "field": "Commands allowed during a sanitize operation as
per SATA-3",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "SANITIZE ANTIFREEZE LOCK EXT command supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Multiple logical sector setting is valid",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Current logical sectors setting transferred per
DRQ data block",
                        "valtype": "num",
                        "numvalue": 16
                    },
                    {
                        "field": "User addressable logical sectors 28-bit",
                        "valtype": "num",
                        "numvalue": 250
                    },
                    {
                        "field": "Multi-word DMA mode 2 selected",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Multi-word DMA mode 1 selected",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Multi-word DMA mode 0 selected",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Multi-word DMA mode 2 and below supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Multi-word DMA mode 1 and below supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Multi-word DMA mode 0 supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "PIO mode 3 and mode 4 supported",
                        "valtype": "num",
                        "numvalue": 3
                    },
                    {
                        "field": "Minimum multi-word DMA transfer cycle time per
word",
                        "valtype": "num",
                        "numvalue": 120
                    },
                    {
```



```
                        "field": "Recommended multi-word DMA transfer cycle time",
                        "valtype": "num",
                        "numvalue": 120
                    },
                    {
                        "field": "Minimum PIO transfer cycle time without flow
control",
                        "valtype": "num",
                        "numvalue": 120
                    },
                    {
                        "field": "Minimum PIO transfer cycle time with IORDY",
                        "valtype": "num",
                        "numvalue": 120
                    },
                    {
                        "field": "Deterministic data in trimmed LBA range
supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Long physical sector alignment error reporting
control supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "READ BUFFER DMA supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "WRITE BUFFER DMA supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "DOWNLOAD MICROCODE DMA supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Optional ATA device 28-bit commands supported
disabled",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Trimmed LBA range returning zeroed data is
supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "All user data encryption active",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Extended user addressable sectors supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "All write cache non-volatile",
                        "valtype": "bool",
                        "boolvalue": false
                    },
```



```
                    {
                        "field": "Maximum queue depth",
                        "valtype": "num",
                        "numvalue": 31
                    },
                    {
                        "field": "READ LOG DMA EXT equivalent to READ LOG EXT
supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Device auto partial to slumber transition
supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Host auto partial to slumber transition
supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "NCQ priority info supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Unload while NCQ commands outstanding
supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "SATA PHY event counters log supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Host initiated power management requests
supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "NCQ feature set supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SATA gen3 signalling speed 6.0Gbps supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SATA gen2 signalling speed 3.0Gbps supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SATA gen1 signalling speed 1.5Gbps supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "RECEIVE FPDMA QUEUED and SEND FPDMA QUEUED
supported",
                        "valtype": "bool",
```



```
                "boolvalue": false
            },
            {
                "field": "NCQ queue management supported",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "NCQ streaming supported",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Current negotiated serial ATA signal speed",
                "valtype": "num",
                "numvalue": 3
            },
            {
                "field": "NCQ auto-sense supported",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Software settings preservation supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Hardware feature control supported",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "In-order data delivery supported",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Initiating power management supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "DMA setup auto-activation supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Non-zero buffer offsets supported",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Auto partial to slumber transitions enabled",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Software settings preservation enabled",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Hardware feature control is enabled",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "In-order data delivery enabled",
```



```
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Device initiated power management enabled",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "DMA setup auto-activation enabled",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Non-zero buffer offsets enabled",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "ACS-3 supported",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "ACS-2 supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "ATA8-ACS supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "ATA/ATAPI-7 supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "ATA/ATAPI-6 supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "ATA/ATAPI-5 supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Minor version number",
                "valtype": "num",
                "numvalue": 0
            },
            {
                "field": "NOP command supported(Word82)",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "READ BUFFER command supported(Word82)",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "WRITE BUFFER command supported(Word82)",
                "valtype": "bool",
                "boolvalue": true
            },
            {
```



```
                        "field": "DEVICE RESET command supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Read look-ahead supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Volatile write cache supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "PACKET feature set supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Power management feature set supported(Word82)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Security feature set supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SMART feature set supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "FLUSH CACHE EXT command supported(Word83)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "FLUSH CACHE command supported)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "DCO feature set supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "The 48-bit address feature set
supported(Word83)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SET FEATURES subcommand  required to spin-
up(Word83)",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "PUIS feature set supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "APM feature set supported",
                        "valtype": "bool",
```



```
                        "boolvalue": true
                    },
                    {
                        "field": "DOWNLOAD MICROCODE command supported(Word83)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "IDLE IMMEDIATE command with UNLOAD FEATURE
supported(Word84)",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "World wide name supported(Word84)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "WRITE DMA FUA EXT and MULTIPLE FUA EXT command
supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "GPL feature set supported(Word84)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Streaming feature set supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "SMART self-test supported(Word84)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SMART error logging supported(Word84)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "NOP command supported(Word85)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "READ BUFFER command supported(Word85)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "WRITE BUFFER command supported(Word85)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "DEVICE RESET command not supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Read look-ahead enabled",
                        "valtype": "bool",
                        "boolvalue": true
                    },
```



```
                    {
                        "field": "Volatile write cache enabled",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "PACKET feature set not supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Power management feature set supported(Word85)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Security feature set enabled",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "SMART feature set enabled",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Words 119..120 validity",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "FLUSH CACHE EXT command supported(Word86)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "FLUSH CACHE command supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "The 48-bit address feature set
supported(Word86)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SET FEATURES subcommand required to spin-
up(Word86)",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "PUIS feature set enabled",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "APM feature set enabled",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "DOWNLOAD MICROCODE command supported(Word86)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
```



```
                        "field": "IDLE IMMEDIATE command with UNLOAD FEATURE
supported(Word87)",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "World wide name supported(Word87)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "WRITE DMA FUA EXT and MULTIPLE FUA EXT commands
supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "GPL feature set supported(Word87)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Media serial number valid",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "SMART self-test supported(Word87)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SMART error logging supported(Word87)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Ultra DMA mode 6 selected",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Ultra DMA mode 5 selected",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Ultra DMA mode 4 selected",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Ultra DMA mode 3 selected",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Ultra DMA mode 2 selected",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Ultra DMA mode 1 selected",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Ultra DMA mode 0 selected",
                        "valtype": "bool",
```



```
                "boolvalue": false
            },
            {
                "field": "Ultra DMA mode 6 and below supported",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Ultra DMA mode 5 and below supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Ultra DMA mode 4 and below supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Ultra DMA mode 3 and below supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Ultra DMA mode 2 and below supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Ultra DMA mode 1 and below supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Ultra DMA mode 0 supported",
                "valtype": "bool",
                "boolvalue": true
            },
            {
                "field": "Extended time reported for normal erase mode",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Time required for normal erase mode",
                "valtype": "num",
                "numvalue": 1
            },
            {
                "field": "Extended time reported for enhanced erase mode",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Time required for enhanced erase mode",
                "valtype": "num",
                "numvalue": 1
            },
            {
                "field": "Current APM level value",
                "valtype": "num",
                "numvalue": 254
            },
            {
                "field": "Master password identifier",
                "valtype": "num",
                "numvalue": 65534
            },
            {
                "field": "Stream minimum request size",
```



```
                "valtype": "num",
                "numvalue": 0
            },
            {
                "field": "DMA streaming transfer time",
                "valtype": "num",
                "numvalue": 0
            },
            {
                "field": "DMA and PIO streaming access latency",
                "valtype": "num",
                "numvalue": 0
            },
            {
                "field": "Streaming performance granularity",
                "valtype": "num",
                "numvalue": 0
            },
            {
                "field": "User addressable logical sectors",
                "valtype": "num",
                "numvalue": 250
            },
            {
                "field": "PIO streaming transfer time",
                "valtype": "num",
                "numvalue": 0
            },
            {
                "field": "Maximum blocks per DATA SET MANAGEMENT command",
                "valtype": "num",
                "numvalue": 8
            },
            {
                "field": "Multiple logical sectors per physical sector",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Logical sector longer than 256 words",
                "valtype": "bool",
                "boolvalue": false
            },
            {
                "field": "Logical sectors per physical sector",
                "valtype": "num",
                "numvalue": 0
            },
            {
                "field": "Inter-seek delay",
                "valtype": "num",
                "numvalue": 0
            },
            {
                "field": "World wide name",
                "valtype": "num",
                "numvalue": 17432044608943640576
            },
            {
                "field": "Logical sector size",
                "valtype": "num",
                "numvalue": 0
            },
            {
                "field": "DSN feature set supported",
                "valtype": "bool",
                "boolvalue": false
            },
            {
```



```
                        "field": "Accessible maximum address configuration feature
set supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "EPC feature set supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Sense data reporting feature set supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Free-fall control feature set supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Download microcode mode 3 supported(Word119)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "READ and WRITE LOG DMA EXT commands supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "WRITE UNCORRECTABLE EXT command
supported(Word119)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Write-Read-Verify feature set supported",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "DSN feature set enabled",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "EPC feature set enabled",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Sense data reporting feature set enabled",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Free-fall control feature set enabled",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Download microcode mode 3 supported(Word120)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "READ LOG DMA EXT command and WRITE LOG DMA EXT
command supported",
```



```
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "WRITE UNCORRECTABLE EXT command
supported(Word120)",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Write-Read-Verify feature set enabled",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Master password capability",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Enhanced security erase supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Security count expired",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Security frozen",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Security locked",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Security enabled",
                        "valtype": "bool",
                        "boolvalue": false
                    },
                    {
                        "field": "Security supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Device nominal form factor",
                        "valtype": "num",
                        "numvalue": 3
                    },
                    {
                        "field": "TRIM bit in the DATA SET MANAGEMENT command
supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Additional product identifier",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Current media serial number",
                        "valtype": "str",
                        "strvalue": ""
```



```
                    },
                    {
                        "field": "SCT data tables command supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SCT feature control command supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SCT error recovery control command supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SCT write same command supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SCT command transport supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Logical sector offset within first physical
sector",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Write-Read-Verify sector mode 3 count",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Write-Read-Verify sector mode 2 count",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Nominal media rotation rate",
                        "valtype": "num",
                        "numvalue": 1
                    },
                    {
                        "field": "Write-Read-Verify feature set current mode",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Transport type",
                        "valtype": "num",
                        "numvalue": 1
                    },
                    {
                        "field": "SATA 30.1 supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SATA 3 supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SATA 20.6 supported",
```



```
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SATA 20.5 supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SATA iI: extensions supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "SATA 1.0a supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "ATA8-AST supported",
                        "valtype": "bool",
                        "boolvalue": true
                    },
                    {
                        "field": "Transport minor version number",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Extended number of user addressable sectors",
                        "valtype": "num",
                        "numvalue": 0
                    },
                    {
                        "field": "Minimum number of blocks per download
microcode",
                        "valtype": "num",
                        "numvalue": 1
                    },
                    {
                        "field": "Maximum number of blocks per download
microcode",
                        "valtype": "num",
                        "numvalue": 65535
                    },
                    {
                        "field": "Checksum",
                        "valtype": "num",
                        "numvalue": 69
                    },
                    {
                        "field": "Checksum validity indicator",
                        "valtype": "num",
                        "numvalue": 165
                    }
                ]
            }
        ]
    }
}
```


Example 5: Identify data of device behind Raid

```
tsbdrv identify raid_p0:6


raid_p0:6 Identify data
```



```
Attribute
Value
-------------------------------------------------------------------------------
-----------------------------------------

Non ATA device
0 [0x0]

Incomplete response
0 [0x0]

Specific configuration
51255 [0xc837]

Serial number
5662K001FYVD

Firmware revision
GZ2D

Model number
TOSHIBA MG05ACA800EY

Maximum logical sectors transferred per DRQ data block
16 [0x10]

Trusted computing feature set options Bit 15
0 [0x0]

Trusted computing feature set options Bit 14
0 [0x0]

Trusted computing feature reserved options
0 [0x0]

Trusted computing feature support
0 [0x0]

Standby timer specific to SAT-3 standard
1 [0x1]

IORDY supported
1 [0x1]

IORDY enabled
1 [0x1]

LBA supported
1 [0x1]

DMA supported
1 [0x1]

Long physical sector alignment error reporting
0 [0x0]

Minimum standby vendor specific time value supported
0 [0x0]

Free-fall control sensitivity
0 [0x0]

Word 88 validity
1 [0x1]

Words 64..70 validity
1 [0x1]

BLOCK ERASE EXT command supported
0 [0x0]

OVERWRITE EXT command supported
1 [0x1]

CRYPTO SCRAMBLE EXT command supported
1 [0x1]
```



```
Sanitize feature set supported
1 [0x1]

Commands allowed during a sanitize operation as per SATA-3
1 [0x1]

SANITIZE ANTIFREEZE LOCK EXT command supported
1 [0x1]

Multiple logical sector setting is valid
1 [0x1]


[...]


Minimum number of blocks per download microcode
1 [0x1]

Maximum number of blocks per download microcode
4224 [0x1080]

Checksum
247 [0xf7]

Checksum validity indicator
165 [0xa5]

-------------------------------------------------------------------------------
-----------------------------------------


Command return code: 0x00000000 [Command completed successfully]
```

Example 6: Identify data of SCSI device with -e option

```
# tsbdrv identify sdl -e


/dev/sdl Inquiry data


Attribute
Value
-------------------------------------------------------------------------------
--------------------------------------------------

Peripheral qualifier
0 [0x0]

Peripheral device type
0 [0x0]

Removable medium
0 [0x0]

Version
6 [0x6]

[   ]

Version descriptor 7
0 [0x0]

Version descriptor 8
0 [0x0]

-------------------------------------------------------------------------------
--------------------------------------------------
```



```
Extended Inquiry Data:


Attribute
Value
--------------------------------------------------------------------------------
--------------------------------------------------

Reference tag check
1 [0x1]

Application tag check
1 [0x1]

Guard check
1 [0x1]

Supported protection type
1 [0x1]

Activate microcode
1 [0x1]

Simple supported
1 [0x1]

Ordered supported
1 [0x1]

Head of queue supported
1 [0x1]

Priority supported
0 [0x0]

Grouping function supported
0 [0x0]

Unit attention condition sense key specific data supported
0 [0x0]

Volatile cache supported
1 [0x1]

Nonvolatile cache supported
0 [0x0]

Write uncorrectable supported
1 [0x1]

Logical unit I_T nexus clear
0 [0x0]

Protection information interval supported
0 [0x0]

No protection information checking
0 [0x0]

History snapshots release effects
0 [0x0]

Revert to defaults supported
0 [0x0]

Referrals supported
0 [0x0]

Logical unit collection type
0 [0x0]
```



```
Multi I_T nexus microcode download
2 [0x2]

Extended self-test completion minutes
413 [0x19d]

Download microcode support byte is valid
0 [0x0]

Vendor specific activation supported
0 [0x0]

Hard reset activation supported
0 [0x0]

Power on activation supported
0 [0x0]

Maximum supported sense data length
0 [0x0]

No redirect zero supported
0 [0x0]

No redirect one supported
0 [0x0]

Set affiliation command supported
0 [0x0]

Implicit affiliation supported
0 [0x0]

Implicit bind supported
0 [0x0]

Maximum inquiry change logs
0 [0x0]

Maximum mode page change logs
0 [0x0]

Activate deferred microcode mode supported
0 [0x0]

Download microcode with offsets, save, and defer activate mode supported
0 [0x0]

Download microcode with offsets, select activation events, save, and defer
activate mode supported    0 [0x0]

Download microcode with offsets, save, and activate mode supported
0 [0x0]

Download microcode with offsets and activate mode supported
0 [0x0]

Download microcode, save, and activate mode supported
0 [0x0]

Download microcode and activate mode supported
0 [0x0]

-------------------------------------------------------------------------
-------------------------------------------------
```

Command return code: 0x00000000 [Command completed successfully]

5.4 Firmware

Firmware command is used for managing device firmware, packaging and unpackaging of firmware files.

The syntax for this command and its sub-commands is as follows:

```
tsbdrv firmware status <devid> [-xml] [-j] [-hex] [-v]

tsbdrv firmware download <devid> <image_path> [-mn <value>] [-n] [-s] [-m] [-df] [-x] [-v]

tsbdrv firmware activate <devid> [-s] [-x] [-v]

tsbdrv firmware package <image_path> <fw_version> <action> <data_loss> [-m <value>] [-r <value>] [-u <value>] [-od <value>] [-of <value>]

tsbdrv firmware unpackage <package_path> [-od <value>] [-of <value>]

tsbdrv firmware pkginfo <package_path> [-xml] [-j]
```

5.4.1 Firmware status

This command is used to display firmware status on device.

The syntax for this command is as follows:

```
tsbdrv firmware status <devid> [-xml] [-j] [-hex] [-v]
```

Below table describes the parameters and sample usage of '*firmware status*' command.

Argument	Description
Mandatory Parameter	
devid	Device identifier
Optional Parameter	
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output
-v, --verbose	Display verbose output

Example 1: Firmware status on SATA device

```
tsbdrv firmware status sda

Firmware slot information on '/dev/sda'::

Current firmware revision : KC48

SLOT    FW-VER    READ-ONLY
---------------------------
1       KC48      No

Current active slot        : 1

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Firmware status on SAS device in XML

```
tsbdrv firmware status sdf –xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
enable="1">
    <DRIVE>
        <PHYSICAL_DRIVE>/dev/sdf</PHYSICAL_DRIVE>
        <FIRMWARE_STATUS>
```



```
                <CURRENT_FW_REV>0101</CURRENT_FW_REV>
                <CURRENT_ACTIVE_SLOT>1</CURRENT_ACTIVE_SLOT>
                <SLOT>
                    <SLOT_NO>1</SLOT_NO>
                    <FW_REV_NO>0101</FW_REV_NO>
                    <READ_ONLY>true</READ_ONLY>
                </SLOT>
            </FIRMWARE_STATUS>
        </DRIVE>
    </tsbdrv>
```

Example 3: Hex dump of firmware status on SATA device

```
tsbdrv firmware status sdd -hex

Hex-dump of firmware slot information on '/dev/sdd'::

------------------------------------------------------------
00000000: 40 00 00 00 37 c8 10 00 00 00 00 00 3f 00 00 00   '@...7.......?...'
00000010: 00 00 00 00 20 20 20 20 20 20 20 20 35 34 53 44   '....        54SD'
00000020: 30 31 43 39 39 54 57 55 00 00 00 00 00 00 55 4a   '01C99TWU......UJ'
00000030: 41 47 31 30 31 30 4f 54 48 53 42 49 20 41 48 54   'AG1010OTHSBI AHT'
...
...
Output snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 a5 45   '...............E'
------------------------------------------------------------


Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Firmware status on SATA device in JSon format

```
tsbdrv firmware status sdd –j

{
    “DrvCommonTool”: {
        "drive": [
            {
                "physical_drive": "/dev/sdd",
                "firmware_status": {
                    "current_fw_rev": "JUGA0101",
                    "current_active_slot": 1,
                    "slot": [
                        {
                            "slot_no": 1,
                            "fw_rev_no": "JUGA0101",
                            "read_only": true
                        }
                    ]
                }
            }
        ]
    }
}
```

5.4.2 Firmware download

This command is used for updating the drive firmware.
The syntax for this command is as follows:

```
tsbdrv firmware download <devid> <image_path> [-mn <value>] [-n] [-s] [-m] [-df] [-x] [-v]
```

Below table describes the parameters and sample usage of ‘*firmware download*’ command.

Argument	Description
Mandatory Parameter	
devid	Single device identifier or multiple device identifiers comma separated list [Max: 255 devid in list] or all

image_path	Firmware image/package file path
Optional Parameter	
-mn, --model_name	Device Model Name. Parameter is ignored if devid is other than all
-n, --noDataSafety	Force firmware download even if there is a possibility of user data loss
-s, --silent	Silent/unattended mode
-m, --dma	Use DMA mode to download firmware if available (Applicable only for SATA , it will be ignored for others)
-df, --defer	Deferred activation of the downloaded firmware
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output

Note

1. Firmware image being used to download must be compatible with drive.
2. Please use `--noDataSafety` option with care. Please take back-up of your sensitive data if this option is used.
3. Deferred mode download can fail if drive (or current firmware on drive) doesn't support this mode.
4. DMA mode download request is ignored if mode is not supported by system/drive.
5. TSBDRV can download firmware on multiple devices (maximum 32) with `device_id` argument provided as comma separated list to command.
6. While updating firmware on multiple devices in one command
   a. Requested devices must be of same model or given firmware image must be applicable to all the requested devices.
   b. If firmware download fails on one or more devices, then firmware download will continue on next device.
   c. Final report displays the list of device on which firmware download was successful and failed.
   d. If firmware download was successful on few devices but failed on few then final return code will not be success.
7. Failed firmware download attempts with an incompatible drive could put the drive to an inconsistent state. Please refer Appendix-A for steps to recover the drive on respective operating system.
8. This is not recommended to execute '*firmware download*' command in parallel with any other command on same device.
9. To download firmware on devices having same model number, `-mn` can be given as a sub string of model number with `device_id` as "all" with. Example: `-mn` MG08ACA will download the firmware to all connected MG08ACA drives
10. `-mn` is applicable only when `device_id` argument is "all".
11. Power cycle is required for firmware activation of native SAS drives in ESXI.

Example 1: Firmware Download with image file

```
tsbdrv firmware download sdb ../MG07ACA12TE/qa4302.ftd
Current firmware '4302' will be updated on device '/dev/sdb'.
This may cause data loss.
Do you want to continue? [y/N] Y

/dev/sdb: FIRMWARE DOWNLOAD IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...

/dev/sdb: Firmware download command completed successfully.

[Old-revision:4302] [New-revision:4302]  (Same revision)
Firmware may not be activated.

Firmware download was successful on following device(s):
/dev/sdb
```

```
Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Firmware Download with package file having data loss flag OFF

```
tsbdrv firmware download sdb qa4302-pkg2.ftd
Current firmware '4302' will be updated to '4302' on device '/dev/sdb'.
Do you want to continue? [Y/n] Y

/dev/sdb: FIRMWARE DOWNLOAD IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...

/dev/sdb: Firmware download command completed successfully.

[Current-revision:4302] [Pending-revision:Unknown(activation pending)]
Please perform 'System Reboot' to activate the firmware.

Firmware download was successful on following device(s):
/dev/sdb

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Firmware Download with package file having data loss flag ON

```
tsbdrv firmware download sdb qa4302-pkg.ftd
Current firmware '4303' will be updated to '4302' on device '/dev/sdb'.
This may cause data loss.
Do you want to continue? [y/N] y

/dev/sdb: FIRMWARE DOWNLOAD IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...

/dev/sdb: Firmware download and activation command completed
successfully.

[Old-revision:4303] [New-revision:4302]
Firmware download was successful on following device(s):
/dev/sdb

Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Firmware download with –x option

```
tsbdrv firmware download sdb qa4303.ftd -x
Current firmware '4302' will be updated on device '/dev/sdb'.
This may cause data loss.
Do you want to continue? [y/N] Y

/dev/sdb: FIRMWARE DOWNLOAD IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...

/dev/sdb: Firmware download and activation command completed
successfully.

[Old-revision:4302] [New-revision:4303]
Firmware download was successful on following device(s):
/dev/sdb

Command return code: 0x00000000 [Command completed successfully]
```

Example 5: Firmware Download with image file on multiple devices of same Model number

```
tsbdrv firmware download sda,sdb,sdd MG07ACA12TE/qa4302.ftd

Current firmware '4303' will be updated on device '/dev/sda'.
This may cause data loss.
Do you want to continue? [y/N] y
```



```
    /dev/sda: FIRMWARE DOWNLOAD IS STARTED.
    WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
    OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
    THIS MAY TAKE SOME TIME. PLEASE WAIT...

    /dev/sda: Firmware download and activation command completed
    successfully.

    [Old-revision:4303] [New-revision:4302]
    Current firmware '4303' will be updated on device '/dev/sdb'.
    This may cause data loss.
    Do you want to continue? [y/N] y
    Invalid input! Try again.
    Do you want to continue? [y/N] y

    /dev/sdb: FIRMWARE DOWNLOAD IS STARTED.
    WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
    OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
    THIS MAY TAKE SOME TIME. PLEASE WAIT...

    /dev/sdb: Firmware download and activation command completed
    successfully.

    [Old-revision:4303] [New-revision:4302]
    Current firmware '4303' will be updated on device '/dev/sdd'.
    This may cause data loss.
    Do you want to continue? [y/N] Y

    /dev/sdd: FIRMWARE DOWNLOAD IS STARTED.
    WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
    OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
    THIS MAY TAKE SOME TIME. PLEASE WAIT...

    /dev/sdd: Firmware download and activation command completed
    successfully.

    [Old-revision:4303] [New-revision:4302]
    Firmware download was successful on following device(s):
    /dev/sda
    /dev/sdb
    /dev/sdd

Command return code: 0x00000000 [Command completed successfully]
```

Example 7: Deferred firmware download on SCSI device

```
    tsbdrv firmware download sdf MG03SCA300/H2DG09.BIN -df
    Current firmware 'DG09' will be updated on device '/dev/sdf'.
    This may cause data loss.
    Do you want to continue? [y/N] y

    /dev/sdf: FIRMWARE DOWNLOAD IS STARTED.
    WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
    OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STAT
    THIS MAY TAKE SOME TIME. PLEASE WAIT...

    /dev/sdf: Firmware download command completed successfully.

    [Current-revision:DG09] [Pending-revision:Unknown(activation pending)]
    Firmware will be activated on execution of 'activate' command in tool or
    on next 'Device Reset/System Reboot'.

    Firmware download was successful on following device(s):
    /dev/sdf

    Command return code: 0x00000000 [Command completed successfully]
```

Example 8: Firmware Download on all devices with optional Model number parameter

```
    tsbdrv query all | grep MG07ACA
```



```
/dev/sda          Ready       4303      TOSHIBA MG07ACA12TE
Y9W0A053FDVG                   SCSI       ATA
/dev/sdb          Ready       4303      TOSHIBA MG07ACA12TE
79L0A2MEFDUG                   SCSI       ATA
/dev/sdd          Ready       4303      TOSHIBA MG07ACA12TE
4950A0MTFDUG                   SCSI       ATA

tsbdrv firmware download all MG07ACA12TE/qa4302.ftd -mn MG07ACA
Current firmware '4303' will be updated on device '/dev/sda'.
This may cause data loss.
Do you want to continue? [y/N] y

/dev/sda: FIRMWARE DOWNLOAD IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...

/dev/sda: Firmware download and activation command completed
successfully.

[Old-revision:4303] [New-revision:4302]
Current firmware '4303' will be updated on device '/dev/sdb'.
This may cause data loss.
Do you want to continue? [y/N] y
Invalid input! Try again.
Do you want to continue? [y/N] y

/dev/sdb: FIRMWARE DOWNLOAD IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...

/dev/sdb: Firmware download and activation command completed
successfully.

[Old-revision:4303] [New-revision:4302]
Current firmware '4303' will be updated on device '/dev/sdd'.
This may cause data loss.
Do you want to continue? [y/N] Y

/dev/sdd: FIRMWARE DOWNLOAD IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...

/dev/sdd: Firmware download and activation command completed
successfully.

[Old-revision:4303] [New-revision:4302]
Firmware download was successful on following device(s):
/dev/sda
/dev/sdb
/dev/sdd

Command return code: 0x00000000 [Command completed successfully]
```

5.4.3 Firmware activate

This command is used to activate the previously downloaded firmware in the deferred activation mode.

The syntax for this command is as follows:

```
tsbdrv firmware activate <devid> [-s] [-x] [-v]
```

Below table describes the parameters and sample usage of '*firmware activate*' command.

Argument	Description
Mandatory Parameter	
devid	Device identifier
Optional Parameter	
-s, --silent	Silent/unattended mode
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output

Note

1. Firmware activation request will fail if there is no firmware download pending for activation. Such case can put device in inconsistent/inaccessible mode on some Windows system. The device must be refreshed before it can be used. Please refer Appendix-A for steps to recover the device on respective operating system.
2. This is not recommended to execute '*firmware activate*' command in parallel with any other command on same device.

Example 1: Activate when firmware activation is pending

```
tsbdrv firmware activate sdb -s

/dev/sdb: FIRMWARE ACTIVATION IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...
Active firmware code will be updated on device in silent mode.

/dev/sdb: Firmware activation command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Activate when firmware activation is not pending

```
tsbdrv firmware activate sdb -s

/dev/sdb: FIRMWARE ACTIVATION IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...
Active firmware code will be updated on device in silent mode.
Command return code: 0x80002800
TSBERR40: ATA Microcode Activation failed

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1491583049-14988.log' for
details.
```

Example 3: Activate with –x option when firmware activation is pending on device

```
tsbdrv firmware activate sde -s -x

/dev/sde: FIRMWARE ACTIVATION IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...
Active firmware code will be updated on device in silent mode.

/dev/sde: Firmware activation command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Activate without –s option

```
tsbdrv firmware activate sdb

/dev/sdb: FIRMWARE ACTIVATION IS STARTED.
```



```
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...
/dev/sdb: Active firmware code will updated on device.
Do you want to continue? [y/N] y

/dev/sdb: Firmware activation command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

5.4.4 Firmware package

This command is used to create a packaged firmware file from a raw firmware file. It creates the package with information such as action required to be performed after the download is completed, whether a data loss can occur if the firmware file is downloaded, model number and package date. Also user can add information up to 8 bytes in the reserved field that can be fetched later from the packaged file.

The syntax for this command is as follows:

```
tsbdrv firmware package <image_path> <fw_version> <action> <data_loss> [-m <value>]
[-r <value>] [-u <value>] [-od <value>] [-of <value>]
By default the following optional parameters are specified: -m "" -r "" -u "" -od ""
-of ""
```

Below table describes the parameters and sample usage of '*firmware package*' command.

Argument	Description
Mandatory Parameter	
image_path	Firmware image file path
fw_version	Firmware version string (Max: 8 char)
action	Action required after firmware download (0:No operation, 1:Reboot, 2:Power down, 3:Power cycle, 4:Full power down, 5:Full power cycle)
data_loss	Can Firmware download cause data loss (Y/N)
Optional Parameter	
-m, --model	Device model number (Max: 40 char)
-r, --pkg_date	Package release date in format DDMMYYYY
-u, --usr_data	User data (Max: 8 bytes. First 8 bytes will be accepted and rest of the data will be ignored)
-od, --out_dir	Output directory (if not provided then new file will be saved in same directory as of firmware image file)
-of, --out_file	Output file name (do not include path)

Note

1. Output file name parameter with --out_file option should contain file name only. File name with relative or absolute path will be rejected.
2. To change the path, use --out_dir option in combination with --out_file option to save file with specific name at specific path.
3. If --out_file option is used for file name of user choice while a file with same file name exists, the existing file will be over-written without warning.

Example 1: Package creation with default file name [decided by tool] and default directory [Same as of firmware image path]

```
tsbdrv firmware package ~/fw-images/JZEE60@1.enc JZEE60@1 0 N

Package file '~/fw-images/JZEE60@1-pkg.enc' created successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Package creation with default file name [decided by tool] and current directory

```
tsbdrv firmware package ~/fw-images/JZEE60@1.enc JZEE60@1 0 N -od .

Package file './JZEE60@1-pkg.enc' created successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Package creation with model number

```
tsbdrv firmware package ~/fw-images/JZEE60@1.enc JZEE60@1 0 N -m
"TOSHIBA THNSNJ960PCSZ"

Package file '~/fw-images/JZEE60@1-pkg1.enc' created successfully.

Command return code: 0x00000000 [Command completed successfully]
```

5.4.5 Firmware unpackage

This command is used to extract a raw firmware image from the packaged firmware file.

The syntax for this command is as follows:

```
tsbdrv firmware unpackage <package_path> [-od <value>] [-of <value>]
By default the following optional parameters are specified: -od "" -of ""
```

Below table describes the parameters and sample usage of '*firmware unpackage*' command.

Argument	Description
Mandatory Parameter	
package_path	Package file path
Optional Parameter	
-od, --out_dir	Output directory (if not provided then new file will be saved in same directory as of package file)
-of, --out_file	Output file name (do not include path)

Note

1. Output file name parameter with --out_file option should contain file name only. File name with relative or absolute path will be rejected.
2. To change the path, use --out_dir option in combination with --out_file option to save file with specific name at specific path.
3. If --out_file option is used for file name of user choice while a file with same file name exists, the existing file will be over-written without warning.

Example 1: Unpackage with default file name [decided by tool] and default directory [Same as of package file path]

```
tsbdrv firmware unpackage ./JZEE60@1-pkg.enc

Firmware image extracted successfully as './JZEE60@1.enc'

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Unpackage with default file name [decided by tool] and path of user choice

```
tsbdrv firmware unpackage ./JZEE60@1-pkg.enc -od /tmp

Firmware image extracted successfully as '/tmp/JZEE60@1.enc'

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Unpackage with file name of user choice and default directory [Same as of package file path]

```
tsbdrv firmware unpackage ./JZEE60@1-pkg.enc -of myfw.enc

Firmware image extracted successfully as './myfw.enc'
```

```
    Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Unpackage with file name and path of user choice

```
    tsbdrv firmware unpackage ./JZEE60@1-pkg.enc -od /tmp -of myfw.enc
    Firmware image extracted successfully as '/tmp/myfw.enc'

    Command return code: 0x00000000 [Command completed successfully]
```

5.4.6 Firmware pkginfo

This command is used to print package header information from the packaged file.

The syntax for this command is as follows:

```
tsbdrv firmware pkginfo <package_path> [-xml] [-j]
```

Below table describes the parameters and sample usage of '*firmware pkginfo*' command.

Argument	Description
Mandatory Parameter	
package_path	Package file path
Optional Parameter	
-xml, --xml	Display XML output
-j, --json	Display JSon output

Example 1: Package information of package having model number

```
    tsbdrv firmware package JZEE60@1.enc JZEE60@1 0 N -m "TOSHIBA
    THNSNJ960PCSZ"

    Package file './JZEE60@1-pkg.enc' created successfully

    Command return code: 0x00000000 [Command completed successfully]


    tsbdrv firmware pkginfo ./JZEE60@1-pkg.enc
    Package header:
    Package file           : ./JZEE60@1-pkg.enc
    Signature              : #TOSHIBA
    Header size            : 128 bytes
    Model number           : TOSHIBA THNSNJ960PCSZ
    Firmware version       : JZEE60@1
    Update action          : No operation
    Data loss possibility  : No
    Package date           : 31-08-2015
    User data              :
    Firmware size          : 516096 bytes

    Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Package information of package having user operation as "Reboot" and data loss as "Yes"

```
    tsbdrv firmware package JZEE60@1.enc JZEE60@1 1 Y

    Package file './JZEE60@1-pkg1.enc' created successfully

    Command return code: 0x00000000 [Command completed successfully]


    tsbdrv firmware pkginfo ./JZEE60@1-pkg1.enc
```



```
    Package header:
    Package file           : ./JZEE60@1-pkg1.enc
    Signature              : #TOSHIBA
    Header size            : 128 bytes
    Model number           :
    Firmware version       : JZEE60@1
    Update action          : Reboot
    Data loss possibility  : Yes
    Package date           :
    User data              :
    Firmware size          : 516096 bytes

    Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Package information of package having user data and release date

```
    tsbdrv firmware package JZEE60@1.enc JZEE60@1 0 N --usr_data "MY DATA" -r
    "02052016"

    Package file './JZEE60@1-pkg2.enc' created successfully

    Command return code: 0x00000000 [Command completed successfully]


    tsbdrv firmware pkginfo ./JZEE60@1-pkg2.enc
    Package header:
    Package file           : ./JZEE60@1-pkg2.enc
    Signature              : #TOSHIBA
    Header size            : 128 bytes
    Model number           : TOSHIBA THNSNJ960PCSZ
    Firmware version       : JZEE60@1
    Update action          : No operation
    Data loss possibility  : No
    Package date           : 02-05-2016
    User data              : MY DATA
    Firmware size          : 516096 bytes

    Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Package information of package having model number in XML

```
tsbdrv firmware package JZEE6102.enc JZEE6102 0 N -m "TOSHIBA THNSNJ960PCSZ"

Package file './JZEE6102-pkg.enc' created successfully.

Command return code: 0x00000000 [Command completed successfully]


tsbdrv firmware pkginfo ./JZEE6102-pkg.enc -xml
<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
enable="1">
<PACKAGE_HEADER>
           <PACKAGE_FILE>./JZEE6102-pkg.enc</PACKAGE_FILE>
           <SIGNATURE>#TOSHIBA</SIGNATURE>
           <HEADER_SIZE>128</HEADER_SIZE>
           <MODEL_NUMBER>TOSHIBA THNSNJ960PCSZ</MODEL_NUMBER>
           <FIRMWARE_VERSION>JZEE6102</FIRMWARE_VERSION>
           <UPDATE_ACTION>No operation</UPDATE_ACTION>
           <DATA_LOSS_POSSIBILITY>No</DATA_LOSS_POSSIBILITY>
           <PACKAGE_DATE></PACKAGE_DATE>
           <USER_DATA></USER_DATA>
           <FIRMWARE_SIZE>516096</FIRMWARE_SIZE>
</PACKAGE_HEADER>
</tsbdrv>
```

Example 5: Firmware package information in JSon format


```
tsbdrv firmware pkginfo /home/SATA/THNSNJ960PCSZ/JZEE6102-pkg.enc -j

{
        “DrvCommonTool”:{
                "package_header": {
                        "package_file" : "/home/SATA/THNSNJ960PCSZ/JZEE6102-
pkg.enc",
                        "signature" : "#TOSHIBA",
                        "headersize_bytes" : "128 [0x80]",
                        "firmware_version" : "JZEE6102",
                        "model_number" : "",
                        "update_action" : "No operation",
                        "data_loss_possibility" : "No",
                        "package_date" : "",
                        "user_data" : "",
                        "firmware_size_bytes" : "516096 [0x7e000]"
                }
          }
}
```


5.5 Smart

Smart command displays SMART attributes, event information and statistical information of the drive.

The syntax for its commands and sub-commands is as follows:

```
tsbdrv smart info <devid> [-src <value>] [-r] [-e] [-tc] [-xml] [-j] [-hex] [-v]

tsbdrv smart errors <devid> [-a] [-xml] [-j] [-hex] [-v]

tsbdrv smart attr <devid> [-xml] [-j] [-hex] [-v]
```

5.5.1 Smart info

This command is used to display SMART attributes, events and statistics information.

The syntax for this command is as follow:

```
tsbdrv smart info <devid> [-src <value>] [-r] [-e] [-tc] [-xml] [-j] [-hex] [-v]
By default the following optional parameters are specified: -src attr
```

Below table describes the parameters and sample usage of '*smart info*' command.

Argument	Description
Mandatory Parameter	
devid	Specific Device Identifier or 'all' to display SMART info of all supported devices
Optional Parameter	
-src, --source	SMART data source [attr: SMART attributes, events: Event Log, stats: Statistics Log, all: All]
-r, --reset	Reset Event Logs (Applicable only for events, it will be ignored for others)
-e, --sme	Enable SMART feature if feature is supported and currently disabled (by default all SMART action will fail if SMART is disabled). (Applicable only for SATA, it will be ignored for others)
-tc, --trip_check	Returns error in case of SMART-trip failure on device (Applicable only for source as 'attr'/'all')
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output
-v, --verbose	Display verbose output

Note

1. If requesting SMART attributes info on SATA device but SMART feature is not supported or disabled on device, then command will fail.
2. If requesting SMART attributes info on SAS device but SMART feature (information exception) is not supported or disabled on device, then command may either fail or print 0 values.
3. If --sme option is provided then tool tries to enable SMART feature but tool doesn't disable feature back.
4. If source 'all' is selected then SMART attributes/ events info / statistics data which are not available on device will not be printed.
5. Option –r/--reset flag resets only events information logs. Therefore, this option is effective only when events info source is selected with '-src events' or '-src all'.
6. Attribute ID printed has following format
   SAS:
   Byte3- Log page
   Byte2- Byte offset in parameter
   Byte0:1- Parameter code

SATA:
Byte3- Log page
Byte2- Log sub-page
Byte1- Offset in attributes field
Byte0- Attribute ID

Example 1: SMART attributes display of all connected devices

```
tsbdrv smart info all

::Device info for /dev/sda::

SMART attributes
-------------------------------------------------------------------------------------------------------------
[0x2F040000] SMART trip additional sense code                                    : 0 (0x0)
[0x2F050000] SMART trip additional sense code qualifier                          : 0 (0x0)
[0x2F000000] SMART trip failure                                                  : 0 (0x0)
[0x2F060000] Recent temperature                                                  : 0 (0x0)
[0x38000001] Power-on Time                                                       : 65544 (0x10008)
-------------------------------------------------------------------------------------------------------------


::Device info for /dev/sdb::

SMART attributes
-------------------------------------------------------------------------------------------------------------
[0x2F040000] SMART trip additional sense code                                    : 0 (0x0)
[0x2F050000] SMART trip additional sense code qualifier                          : 0 (0x0)
[0x2F000000] SMART trip failure                                                  : 0 (0x0)
[0x2F060000] Recent temperature                                                  : 0 (0x0)
[0x38000001] Power-on Time                                                       : 65544 (0x10008)
-------------------------------------------------------------------------------------------------------------


::Device info for /dev/sdc::

SMART attributes
-------------------------------------------------------------------------------------------------------------
[0x00000001] Raw Read Error Rate                                                 : 100 (0x64)
[0x00000009] Power on Hours                                                      : 1290 (0x50A)
[0x0000000C] Drive Power Cycle Count                                             : 7 (0x7)
[0x000000C0] Unexpected Power Loss Count                                         : 2 (0x2)
[0x000000C2] Current Temperature(in Celsius)                                     : 43 (0x2B)
[0x000001C2] Minimum Temperature(in Celsius)                                     : 16 (0x10)
[0x000002C2] Maximum Temperature(in Celsius)                                     : 47 (0x2F)
[0x000000F1] Host Writes                                                         : 38881 (0x97E1)
[0x000000F2] Host Reads                                                          : 15554791
(0xED58E7)
[0x2F000400] SMART trip additional sense code                                    : 0 (0x0)
[0x2F000500] SMART trip additional sense code qualifier                          : 0 (0x0)
[0x2F000000] SMART trip failure                                                  : 0 (0x0)
-------------------------------------------------------------------------------------------------------------


::Device info for /dev/sdd::

SMART attributes
-------------------------------------------------------------------------------------------------------------
[0x2F040000] SMART trip additional sense code                                    : 0 (0x0)
[0x2F050000] SMART trip additional sense code qualifier                          : 0 (0x0)
[0x2F000000] SMART trip failure                                                  : 0 (0x0)
[0x2F060000] Recent temperature                                                  : 0 (0x0)
[0x38000001] Power-on Time                                                       : 65544 (0x10008)
-------------------------------------------------------------------------------------------------------------


::Device info for /dev/sde::

SMART attributes
-------------------------------------------------------------------------------------------------------------
[0x2F040000] SMART trip additional sense code                                    : 0 (0x0)
[0x2F050000] SMART trip additional sense code qualifier                          : 0 (0x0)
[0x2F000000] SMART trip failure                                                  : 0 (0x0)
[0x2F060000] Recent temperature                                                  : 0 (0x0)
[0x38000001] Power-on Time                                                       : 65544 (0x10008)
-------------------------------------------------------------------------------------------------------------

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Event information display on SATA device

```
tsbdrv smart info sda -src events

::Device info for /dev/sda::

Event information
```



```
-------------------------------------------------------------------------------------------------------------
[0x02000000] Write Error:Errors Corrected without substantial delay                    : 0 (0x0)
[0x02000001] Write Error:Errors Corrected with possible delays                         : 0 (0x0)
[0x02000002] Write Error:Total Rewrites or Rereads                                     : 0 (0x0)
[0x02000003] Write Error:Total Errors Corrected                                        : 0 (0x0)
[0x02000004] Write Error:Total times Correction Algorithm processed                    : 0 (0x0)
[0x02000006] Write Error:Total Uncorrected Errors                                      : 0 (0x0)
[0x03000000] Read Error:Errors Corrected without substantial delay                     : 0 (0x0)
[0x03000001] Read Error:Errors Corrected with possible delays                          : 0 (0x0)
[0x03000002] Read Error:Total Rewrites or Rereads                                      : 0 (0x0)
[0x03000003] Read Error:Total Errors Corrected                                         : 0 (0x0)
[0x03000004] Read Error:Total times Correction Algorithm processed                     : 0 (0x0)
[0x03000006] Read Error:Total Uncorrected Errors                                       : 0 (0x0)
[0x05000000] Verify Error:Errors Corrected without substantial delay                   : 0 (0x0)
[0x05000001] Verify Error:Errors Corrected with possible delays                        : 0 (0x0)
[0x05000002] Verify Error:Total Rewrites or Rereads                                    : 0 (0x0)
[0x05000003] Verify Error:Total Errors Corrected                                       : 0 (0x0)
[0x05000004] Verify Error:Total times Correction Algorithm processed                   : 0 (0x0)
[0x05000006] Verify Error:Total Uncorrected Errors                                     : 0 (0x0)
[0x06000000] Non Medium:Non-medium Error Count                                         : 36 (0x24)
-------------------------------------------------------------------------------------------------------------

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: All statistics information display on SAS device in XML format

```
tsbdrv smart info sda -src all -xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
    <DRIVE>
        <PHYSICAL_DRIVE>/dev/sda</PHYSICAL_DRIVE>
        <SMART_ATTRIBUTES>
            <ID>0x2f000000</ID>
            <FIELD>SMART trip failure</FIELD>
            <VALUE>1</VALUE>
        </SMART_ATTRIBUTES>
        <SMART_ATTRIBUTES>
            <ID>0x2f040000</ID>
            <FIELD>SMART trip additional sense code</FIELD>
            <VALUE>93</VALUE>
        </SMART_ATTRIBUTES>
        <SMART_ATTRIBUTES>
            <ID>0x2f050000</ID>
            <FIELD>SMART trip additional sense code qualifier</FIELD>
            <VALUE>0</VALUE>
        </SMART_ATTRIBUTES>
        <SMART_ATTRIBUTES>
            <ID>0x2f060000</ID>
            <FIELD>Recent temperature (in Celsius)</FIELD>
            <VALUE>43</VALUE>
        </SMART_ATTRIBUTES>
        <SMART_ATTRIBUTES>
            <ID>0x38000001</ID>
            <FIELD>Power-on Time (in minutes)</FIELD>
            <VALUE>627986</VALUE>
        </SMART_ATTRIBUTES>
        <EVENT_INFORMATION>
            <ID>0x02000000</ID>
            <FIELD>Write Error:Errors Corrected without substantial delay</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x02000001</ID>
            <FIELD>Write Error:Errors Corrected with possible delays</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x02000002</ID>
            <FIELD>Write Error:Total Rewrites or Rereads</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x02000003</ID>
            <FIELD>Write Error:Total Errors Corrected</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x02000006</ID>
            <FIELD>Write Error:Total Uncorrected Errors</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x02008000</ID>
            <FIELD>Write Error:Vendor Specific</FIELD>
            <VALUE>2171881</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
```



```
            <ID>0x02008001</ID>
            <FIELD>Write Error:Vendor Specific</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x03000000</ID>
            <FIELD>Read Error:Errors Corrected without substantial delay</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x03000001</ID>
            <FIELD>Read Error:Errors Corrected with possible delays</FIELD>
            <VALUE>5</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x03000002</ID>
            <FIELD>Read Error:Total Rewrites or Rereads</FIELD>
            <VALUE>122</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x03000003</ID>
            <FIELD>Read Error:Total Errors Corrected</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x03000006</ID>
            <FIELD>Read Error:Total Uncorrected Errors</FIELD>
            <VALUE>122</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x03008000</ID>
            <FIELD>Read Error:Vendor Specific</FIELD>
            <VALUE>35347235</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x03008001</ID>
            <FIELD>Read Error:Vendor Specific</FIELD>
            <VALUE>127</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x03008003</ID>
            <FIELD>Read Error:Vendor Specific</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x04000000</ID>
            <FIELD>Read Reverse Error:Errors Corrected without substantial delay</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x04000001</ID>
            <FIELD>Read Reverse Error:Errors Corrected with possible delays</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x04000002</ID>
            <FIELD>Read Reverse Error:Total Rewrites or Rereads</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x04000003</ID>
            <FIELD>Read Reverse Error:Total Errors Corrected</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x04000006</ID>
            <FIELD>Read Reverse Error:Total Uncorrected Errors</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x05000000</ID>
            <FIELD>Verify Error:Errors Corrected without substantial delay</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x05000001</ID>
            <FIELD>Verify Error:Errors Corrected with possible delays</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x05000002</ID>
            <FIELD>Verify Error:Total Rewrites or Rereads</FIELD>
            <VALUE>117</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x05000003</ID>
            <FIELD>Verify Error:Total Errors Corrected</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
```



```
        <EVENT_INFORMATION>
            <ID>0x05000006</ID>
            <FIELD>Verify Error:Total Uncorrected Errors</FIELD>
            <VALUE>117</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x06000000</ID>
            <FIELD>Non Medium:Non-medium Error Count</FIELD>
            <VALUE>4313187</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x06008001</ID>
            <FIELD>Non Medium:Vendor Specific</FIELD>
            <VALUE>0</VALUE>
        </EVENT_INFORMATION>
        <EVENT_INFORMATION>
            <ID>0x06008003</ID>
            <FIELD>Non Medium:Vendor Specific</FIELD>
            <VALUE>4</VALUE>
        </EVENT_INFORMATION>
        <GENERAL_STATISTICS>
            <ID>0x0d000000</ID>
            <FIELD>Current Temperature</FIELD>
            <VALUE>43</VALUE>
        </GENERAL_STATISTICS>
        <GENERAL_STATISTICS>
            <ID>0x0d000001</ID>
            <FIELD>Reference Temperature</FIELD>
            <VALUE>65</VALUE>
        </GENERAL_STATISTICS>
    </DRIVE>
</tsbdrv>
```

Example 4: Hex dump of all statistics information on SATA device

```
tsbdrv smart info sdc -src all -hex

/dev/sdc: SMART attributes Hexdump(s):
SMART Data [Page: 0x00, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------------
00000000: 10 00 01 0a 00 64 64 00 00 00 00 00 00 00 02 05   '.....dd.........'
00000010: 00 64 64 00 00 00 00 00 00 00 03 07 00 64 64 00   '.dd..........dd.'
...
...
Output snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 a6   '................'
-------------------------------------------------------------

SAT information exception log page [Page: 0x2F, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------------
00000000: 2f 00 00 0c 00 00 03 08 00 00 1f 00               '/...........'
-------------------------------------------------------------


/dev/sdc: Event information Hexdump(s):
SATA PHY Event Counters Log [Page: 0x11, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------------
00000000: 00 00 00 00 01 10 00 00 02 20 00 00 00 00 03 10   '......... ......'
00000010: 00 00 04 10 00 00 05 20 00 00 00 00 06 10 00 00   '....... ........'
...
...
Output snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0a   '................'
-------------------------------------------------------------


/dev/sdc: General statistics Hexdump(s):
General Statistics [Page: 0x04, SubPage: 0x0001] Hex-Dump
-------------------------------------------------------------
00000000: 02 00 01 00 00 00 00 00 3d 00 00 00 00 00 00 c0   '........=.......'
00000010: 3a 29 00 00 00 00 00 00 be 8f 58 90 05 00 00 c0   ':).........X.....'
...
```



```
...
Output snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
------------------------------------------------------------

General Errors Statistics [Page: 0x04, SubPage: 0x0004] Hex-Dump
------------------------------------------------------------
00000000: 01 00 04 00 00 00 00 00 f6 00 00 00 00 00 00 c0   '................'
00000010: 09 00 00 00 00 00 00 c0 00 00 00 00 00 00 00 00   '................'
...
...
Output snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
------------------------------------------------------------

Temperature Statistics [Page: 0x04, SubPage: 0x0005] Hex-Dump
------------------------------------------------------------
00000000: 01 00 05 00 00 00 00 00 1f 00 00 00 00 00 00 c0   '................'
00000010: 1f 00 00 00 00 00 00 c0 1f 00 00 00 00 00 00 c0   '................'
...
...
Output snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
------------------------------------------------------------

Transport Statistics [Page: 0x04, SubPage: 0x0006] Hex-Dump
------------------------------------------------------------
00000000: 01 00 06 00 00 00 00 00 a9 07 00 00 00 00 00 c0   '................'
00000010: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 c0   '................'
...
...
Output snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
------------------------------------------------------------

Solid State Device Statistics [Page: 0x04, SubPage: 0x0007] Hex-Dump
------------------------------------------------------------
00000000: 01 00 07 00 00 00 00 00 02 00 00 00 00 00 00 e0   '................'
00000010: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
...
...
Output snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
------------------------------------------------------------


Command return code: 0x00000000 [Command completed successfully]
```

Example 5: Smart information in JSon format

```
tsbdrv smart info 2 –j

{
       “DrvCommonTool”:{
              "drive": [
                     {
                            "physical_drive" : "PHYSICALDRIVE2",
                            "smart_attributes": {
                                   "smart_trip_additional_sense_code_0x2f040000" : "0 [0x0]",
                                   "smart_trip_additional_sense_code_qualifier_0x2f050000" : "0
[0x0]",
```



```
                                        "smart_trip_failure_0x2f000000" : "0 [0x0]",
                                        "recent_temperature_in_celsius_0x2f060000" : "38 [0x26]",
                                        "power_on_time_in_minutes_0x38000001" : "2700000 [0x2932e0]"
                                    }
                                }
                            ]
                        }
}
```


Example 6: Smart information with smart trip check

```
tsbdrv smart info sda -src attr -tc

::Device info for /dev/sda::

SMART attributes
-------------------------------------------------------------------------------------------------------------
SMART trip failure [0x2f000000]                                                          : 1 (0x1)
SMART trip additional sense code [0x2f040000]                                            : 93 (0x5D)
SMART trip additional sense code qualifier [0x2f050000]                                  : 18 (0x12)
Recent temperature (in Celsius) [0x2f060000]                                             : 45 (0x2D)
Power-on Time (in minutes) [0x38000001]                                                  : 2700000 (0x2932E0)
Error                                                                                    : TSBERR181: SMART-
trip failure detected on device
-------------------------------------------------------------------------------------------------------------

Command return code: 0x8000b500
TSBERR181: SMART-trip failure detected on device

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1474539816-6972.log' for details.
```

5.5.2 Smart errors

This is used to display command errors for SATA and LBA defects for SCSI.

The syntax for this command is as follow:

```
tsbdrv smart errors <devid> [-a] [-xml] [-j] [-hex] [-v]
```

Below table describes the parameters and sample usage of '*smart errors*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-a, --all	Display all the available command errors (Applicable only for SATA, for SCSI all LBA defects will be printed always)
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output
-v, --verbose	Display verbose output

Note For SATA errors, commands are printed in following order:

- Previous Command 1: Command or reset for which the error is being reported.
- Previous Command 2: Command or reset that preceded the command or reset for which the error is being reported.
- Previous Command 3: Command or reset preceding the one in the fourth command data structure.
- Previous Command 4: Command or reset preceding the one in the third command data structure.
- Previous Command 5: Command or reset preceding the one in the second command data structure.

Example 1: Display command errors for SATA device

```
tsbdrv smart errors sdc
```

```
::Comprehensive error information '/dev/sdc'::
Total                           : 127
------------------------------------------------------------
Error counter 1
    ATA Status
        Transport               : 0
        Error                   : 4
        Count                   : 8
        LBA                     : 111681541480
        Device                  : 64
        Status                  : 81
        Device State            : Active/Idle
        Life timestamp (Hours)  : 4804
    Previous command 1
        Device Control          : 0
        Feature                 : 0
        Count                   : 8
        LBA                     : 111681541480
        Device                  : 64
        Command (OpCode)        : 52
        Timestamp (milliseconds)  : 3541122053
    Previous command 2
        Device Control          : 0
        Feature                 : 0
        Count                   : 8
        LBA                     : 111681541472
        Device                  : 64
        Command (OpCode)        : 52
        Timestamp (milliseconds)  : 3541122052
    Previous command 3
        Device Control          : 0
        Feature                 : 0
        Count                   : 8
        LBA                     : 111681541464
        Device                  : 64
        Command (OpCode)        : 52
        Timestamp (milliseconds)  : 3541122050
    Previous command 4
        Device Control          : 0
        Feature                 : 0
        Count                   : 8
        LBA                     : 111681541456
        Device                  : 64
        Command (OpCode)        : 52
        Timestamp (milliseconds)  : 3541122048
    Previous command 5
        Device Control          : 0
        Feature                 : 0
        Count                   : 8
        LBA                     : 111681541448
        Device                  : 64
        Command (OpCode)        : 52
        Timestamp (milliseconds)  : 3541122048

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Display LBA defects of SCSI devices

```
tsbdrv smart errors sda

::SCSI LBA defect list '/dev/sda'::

------------------------------------------------------------------
Total Primary defects : 0
------------------------------------------------------------------

------------------------------------------------------------------
Total Grown defects : 0
```



```
------------------------------------------------------------------

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Smart command errors of SATA devices in xml

```
tsbdrv smart errors sdc -xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <COMPREHENSIVE_ERROR_INFORMATION>
         <PHYSICAL_DRIVE>/dev/sdc</PHYSICAL_DRIVE>
         <TOTAL>127</TOTAL>
         <ERROR>
          <COUNTER>1</COUNTER>
          <ATA_STATUS>
            <TRANSPORT>0</TRANSPORT>
            <ERROR>4</ERROR>
            <COUNT>8</COUNT>
            <LBA>111681541480</LBA>
            <DEVICE>64</DEVICE>
            <STATUS>81</STATUS>
            <DEVICE_STATE>Active/Idle</DEVICE_STATE>
            <LIFE_TIMESTAMP_HOURS>4804</LIFE_TIMESTAMP_HOURS>
          </ATA_STATUS>
          <PREVIOUS_COMMAND>
            <COUNTER>1</COUNTER>
            <DEVICE_CONTROL>0</DEVICE_CONTROL>
            <FEATURE>0</FEATURE>
            <COUNT>8</COUNT>
            <LBA>111681541480</LBA>
            <DEVICE>64</DEVICE>
            <COMMAND_OPCODE>52</COMMAND_OPCODE>
            <TIMESTAMP_MILLISECONDS>3541122053</TIMESTAMP_MILLISECONDS>
          </PREVIOUS_COMMAND>
          <PREVIOUS_COMMAND>
            <COUNTER>2</COUNTER>
            <DEVICE_CONTROL>0</DEVICE_CONTROL>
            <FEATURE>0</FEATURE>
            <COUNT>8</COUNT>
            <LBA>111681541472</LBA>
            <DEVICE>64</DEVICE>
            <COMMAND_OPCODE>52</COMMAND_OPCODE>
            <TIMESTAMP_MILLISECONDS>3541122052</TIMESTAMP_MILLISECONDS>
          </PREVIOUS_COMMAND>
          <PREVIOUS_COMMAND>
            <COUNTER>3</COUNTER>
            <DEVICE_CONTROL>0</DEVICE_CONTROL>
            <FEATURE>0</FEATURE>
            <COUNT>8</COUNT>
            <LBA>111681541464</LBA>
            <DEVICE>64</DEVICE>
            <COMMAND_OPCODE>52</COMMAND_OPCODE>
            <TIMESTAMP_MILLISECONDS>3541122050</TIMESTAMP_MILLISECONDS>
          </PREVIOUS_COMMAND>
          <PREVIOUS_COMMAND>
            <COUNTER>4</COUNTER>
            <DEVICE_CONTROL>0</DEVICE_CONTROL>
            <FEATURE>0</FEATURE>
            <COUNT>8</COUNT>
            <LBA>111681541456</LBA>
            <DEVICE>64</DEVICE>
            <COMMAND_OPCODE>52</COMMAND_OPCODE>
            <TIMESTAMP_MILLISECONDS>3541122048</TIMESTAMP_MILLISECONDS>
          </PREVIOUS_COMMAND>
          <PREVIOUS_COMMAND>
            <COUNTER>5</COUNTER>
            <DEVICE_CONTROL>0</DEVICE_CONTROL>
            <FEATURE>0</FEATURE>
```



```
            <COUNT>8</COUNT>
            <LBA>111681541448</LBA>
            <DEVICE>64</DEVICE>
            <COMMAND_OPCODE>52</COMMAND_OPCODE>
            <TIMESTAMP_MILLISECONDS>3541122048</TIMESTAMP_MILLISECONDS>
          </PREVIOUS_COMMAND>
         </ERROR>
        </COMPREHENSIVE_ERROR_INFORMATION>
</tsbdrv>
```

Example 4: Smart LBA defects of SCSI devices in xml format

```
tsbdrv smart errors sda -xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <SCSI_LBA_DEFECT_LIST>
         <PHYSICAL_DRIVE>/dev/sda</PHYSICAL_DRIVE>
         <PRIMARY_DEFECTS>
          <TOTAL>0</TOTAL>
         </PRIMARY_DEFECTS>
         <GROWN_DEFECTS>
          <TOTAL>0</TOTAL>
         </GROWN_DEFECTS>
        </SCSI_LBA_DEFECT_LIST>
</tsbdrv>
```

Example 5: Smart command errors of SATA device in JSon format

```
tsbdrv smart errors 3 -j

{
        "DrvCommonTool":{
                "comprehensive_error_information": {
                        "physical_drive" : "PHYSICALDRIVE3",
                        "total" : "14 [0xe]",
                        "errors": {
                                "error": [
                                        {
                                                "counter" : "1 [0x1]",
                                                "ata_status": {
                                                        "transport" : "0 [0x0]",
                                                        "error" : "64 [0x40]",
                                                        "count" : "100 [0x64]",
                                                        "lba" : "1048576
[0x100000]",
                                                        "device" : "64 [0x40]",
                                                        "status" : "81 [0x51]",
                                                        "device_state" :
"Active/Idle",
                                                        "life_timestamp_hours" :
"8571 [0x217b]"
                                                },
                                                "previous_commands": {
                                                        "count" : "5 [0x5]",
                                                        "command": [
                                                                {

"command_number" : "1 [0x1]",

"device_control" : "0 [0x0]",

"feature" : "0 [0x0]",
                                                                        "count" :
"100 [0x64]",
                                                                        "lba" :
"1048576 [0x100000]",
```



```
                                                                    "device" :
"64 [0x40]",
"command_opcode" : "36 [0x24]",
"timestamp_milliseconds" : "5163044 [0x4ec824]"
                                                                  },
                                                                  {
"command_number" : "2 [0x2]",
"device_control" : "0 [0x0]",
"feature" : "0 [0x0]",
                                                                    "count" :
"1 [0x1]",
                                                                    "lba" : "0
[0x0]",
                                                                    "device" :
"0 [0x0]",
"command_opcode" : "236 [0xec]",
"timestamp_milliseconds" : "5163040 [0x4ec820]"
                                                                  },
                                                                  {
"command_number" : "3 [0x3]",
"device_control" : "0 [0x0]",
"feature" : "0 [0x0]",
                                                                    "count" :
"0 [0x0]",
                                                                    "lba" : "0
[0x0]",
                                                                    "device" :
"0 [0x0]",
"command_opcode" : "229 [0xe5]",
"timestamp_milliseconds" : "5163040 [0x4ec820]"
                                                                  },
                                                                  {
"command_number" : "4 [0x4]",
"device_control" : "0 [0x0]",
"feature" : "0 [0x0]",
                                                                    "count" :
"1 [0x1]",
                                                                    "lba" : "0
[0x0]",
                                                                    "device" :
"0 [0x0]",
"command_opcode" : "236 [0xec]",
"timestamp_milliseconds" : "5163040 [0x4ec820]"
                                                                  },
                                                                  {
"command_number" : "5 [0x5]",
"device_control" : "0 [0x0]",
"feature" : "0 [0x0]",
```



```
                                                                                "count" :
"0 [0x0]",
                                                                                "lba" : "0
[0x0]",
                                                                                "device" :
"0 [0x0]",
"command_opcode" : "229 [0xe5]",
"timestamp_milliseconds" : "5162238 [0x4ec4fe]"
                                                                        }
                                                                ]
                                                        }
                                                }
                                        ]
                                }
                        }
                }
        }
}
```


5.5.3 Smart attr

This command is used to display information of SMART attributes of SATA devices.

The syntax for this command is as follow:

```
tsbdrv smart attr <devid> [-xml] [-j] [-hex] [-v]
```

Below table describes the parameters and sample usage of '*smart attr*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output
-v, --verbose	Display verbose output

Example 1: Display smart attributes of SATA device

```
tsbdrv smart attr sdb
::SMART attributes for /dev/sdb::


ID    NAME                                          FLAG        RAW VALUE
VALUE       WORST VALUE      THRESHOLD VALUE
-------------------------------------------------------------------------------
-----------------------------------------
0x01  Raw Read Error Rate                           11 [0xB]    0 [0x0]
100 [0x64]  100 [0x64]       50 [0x32]
0x03  Spin-Up Time                                  39 [0x27]   2573 [0xA0D]
100 [0x64]  100 [0x64]       1 [0x1]
0x05  Re-allocated Sector Count                     51 [0x33]   1008 [0x3F0]
100 [0x64]  100 [0x64]       50 [0x32]
0x09  Power-On Hours Count                          50 [0x32]   1110 [0x456]
98 [0x62]   98 [0x62]        0 [0x0]
0x0C  Power Cycle Count                             50 [0x32]   9 [0x9]
100 [0x64]  100 [0x64]       0 [0x0]
0xBF  Shock Sensor Count                            50 [0x32]   0 [0x0]
100 [0x64]  100 [0x64]       0 [0x0]
0xC0  Emergency Retract Cycle Count                 50 [0x32]   0 [0x0]
100 [0x64]  100 [0x64]       0 [0x0]
0xC1  Load/Unload Cycle Count                       50 [0x32]   6601 [0x19C9]
100 [0x64]  100 [0x64]       0 [0x0]
0xC2  HDA Temperature                               34 [0x22]   28 [0x1C]
100 [0x64]  100 [0x64]       0 [0x0]
```



```
0xC7  Ultra DMA CRC Error Rate                          50 [0x32]   97361 [0x17C51]
100 [0x64]  100 [0x64]       0 [0x0]
0xC8  Unknown_C8                                        50 [0x32]   113090
[0x1B9C2]100 [0x64]  100 [0x64]       0 [0x0]
0xF0  Total Host Writes / Write Head                    50 [0x32]   56 [0x38]
100 [0x64]  100 [0x64]       0 [0x0]
0xF1  Total LBAs Written                                50 [0x32]   1004 [0x3EC]
100 [0x64]  100 [0x64]       0 [0x0]
0xF2  Total LBAs Read                                   50 [0x32]   187637792
[0xB2F2020]100 [0x64]  100 [0x64]       0 [0x0]
0xFE  Free Fall Sensor Event Count (optional)           50 [0x32]   0 [0x0]
100 [0x64]  100 [0x64]       0 [0x0]
-------------------------------------------------------------------------------
-----------------------------------------


Command return code: 0x00000000 [Command completed successfully]
```


5.6 Secerase

Secerase command is used to perform secure erase of the drive. It clears all the user data from device.

The syntax for this command is as follows:

```
tsbdrv secerase <devid> [-pwd <value>] [-enh] [-st <value>] [-s] [-nx] [-v]
```

```
By default the following optional parameters are specified: -pwd "#TOSHIBA" -st ""
```

Below table describes the parameters and sample usage of '*secerase*' command.

Argument	Description
Mandatory Parameter	
devid	Device identifier
Optional Parameter	
-pwd, --password	Security password (Min:2 chars, Max:32 chars). (Applicable only for SATA, it will be ignored for others)
-enh, --enhanced	Use enhanced/cryptographic erase mode (by default normal/block erase mode is used)
-st, --sanitize	Use sanitize operation mode (block:block erase, crypto: Crypto scramble, write: Overwrite, clear: Error-clear)
-s, --silent	Silent/unattended mode
-nx, --no_exclusive	Do not run with exclusive lock operation on device (By default command runs with exclusive lock)
-v, --verbose	Display verbose output

Note

1. By default normal/block erase mode will be used.
2. Secure erase will erase all the data from device. Please back-up sensitive data before executing this command.
3. This is not recommended to execute '*secerase*' command in parallel with any other command on same device.
4. If -st/--sanitize option is not provided, then ATA secure erase will be performed on device.
5. ATA Secure erase operation is not recommended on HDD. Command may get aborted due to SCSI bus reset.
6. Secure erase command on SCSI device may fail on Windows.

Example 1: Secure erase in normal mode

```
tsbdrv secerase sda

Secure erase will destroy all the data from device.
Do you want to continue? [Y/n] y
WARNING: SECURE ERASE TAKES 2 MINUTES. DO NOT POWER OFF THE SYSTEM DURING THIS
OPERATION. THE DRIVE MAY GO IN INCONSISTENT STATE

/dev/sda: Secure erase command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Secure erase in enhanced mode with silent flag

```
tsbdrv secerase sda -enh –s

Warning: Secure erase will destroy all the data from device.
Proceeding with secure erase as silent option selected.
WARNING: SECURE ERASE TAKES 2 MINUTES. DO NOT POWER OFF THE SYSTEM DURING THIS
OPERATION. THE DRIVE MAY GO IN INCONSISTENT STATE

/dev/sda: Secure erase command completed successfully.
```

```
Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Enhanced secure erase on SATA device

```
tsbdrv secerase sdd -enh
Warning: Secure erase will destroy all the data from device.
Do you want to continue? [Y/n] y

WARNING: OPERATION 'Secure erase' MAY CAUSE DATA LOSS on '/dev/sdd'.
Application will wait for '10 seconds' before starting 'Secure erase' on device.
User can cancel the operation in this time frame either by pressing 'CTRL + C' or
by sending TERM signal to process.
..........
Continuing the operation...
WARNING: SECURE ERASE TAKES 60 MINUTES.
         DO NOT POWER OFF THE SYSTEM DURING THIS OPERATION. THE DRIVE MAY GO IN
INCONSISTENT STATE.

/dev/sdd: Secure erase command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Sanitize Block erase on SED device

```
tsbdrv secerase sde -st block -s
Warning: Sanitize device will destroy all the data from device.
Proceeding with operation as silent option selected.
WARNING: OPERATION 'Sanitize device' MAY CAUSE DATA LOSS on '/dev/sde'.
Application will wait for '10 seconds' before starting 'Sanitize device' on
device.
User can cancel the operation in this time frame either by pressing 'CTRL + C' or
by sending TERM signal to process.
..........
Continuing the operation...
Sanitize Progress : 85% -
Sanitize Progress : 100% -

/dev/sde: Secure erase command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 5: Sanitize error-clear on device

```
tsbdrv secerase sdg  -st clear

/dev/sdg: Secure erase command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```


5.7 Format

This command is used to perform device format operation.

The syntax for this command and its subcommands is as follows:

```
tsbdrv format start <devid> [-p] [-s] [-x] [-v ]

tsbdrv format status <devid> [-p] [-xml] [-j] [-v]

tsbdrv format fast <devid> <sector_size> [-v]
```

5.7.1 Format start

This command is used to start device format operation.

The syntax of this command is as follows:

```
tsbdrv format start <devid> [-p] [-s] [-x] [-v]
```

Below table describes the parameters and sample usage of 'format start' command .

Argument	Description
Mandatory Parameter	
devid	Device identifier
Optional Parameter	
-p, --poll	Keeps polling for the progress after starting format operation on device (Applicable only for SCSI, it will be ignored for others)
-s, --silent	Silent/unattended mode
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output

Note

1. Format command is not supported on SATA device(s).
2. Do not execute Format start command for drives connected behind ASR8885 controller.

Example 1: Format of SCSI device with –x option

```
tsbdrv format start sdf -p -x

Warning: Format operation will destroy all the data from device.
Do you want to continue? [Y/n] Y
WARNING: FORMAT OPERATION STARTED ON DEVICE.
         THIS MAY TAKE SOME TIME.
         DO NOT POWER OFF THE SYSTEM DURING THIS OPERATION.THE DRIVE MAY GO IN
INCONSISTENT STATE.

Format status polling will start now.
Press CTRL+C or send abort signal to exit polling at any point on time.

Device format: 0%.................
/dev/sdf: Format unit start command completed successfully
```

5.7.2 Format status

This command is used to display status of format command progress on device. It is applicable only for SCSI devices.

The syntax for this command is as follows:

```
tsbdrv format status <devid> [-p] [-xml] [-j] [-v]
```


Below table describes the parameters and sample usage of '*format status*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-p, --poll	Displays current status of format and keeps on polling for the progress (if format is running)
-xml, --xml	Display XML output (ignored if --poll option is selected)
-j, --json	Display JSon output (ignored if --poll option is selected)
-v, --verbose	Display verbose output

Example 1: Check the status with –p option

```
tsbdrv format status sdf –p

Format status polling will start now.
Press CTRL+C or send abort signal to exit polling at any point on time.

Device format: 18%....
```

Example 2: Check the status in xml format

```
tsbdrv format status sdf –xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <FORMAT_STATUS>
                <PHYSICAL_DRIVE>/dev/sdf</PHYSICAL_DRIVE>
                <ACTIVE>Yes</ACTIVE>
                <COMPLETION>18%</COMPLETION>
        </FORMAT_STATUS>
</TSBDRV>
```

Example 3: Check the status in JSon format

```
tsbdrv format status sda –j

{
        "DrvCommonTool":{
                "format_status": {
                        "physical_drive" : "/dev/sda",
                        "active" : "Yes",
                        "completion" : "18%"
                }
        }
}
```

5.7.3 Format fast

This command is used to change device sector format.

The syntax for this command is as follows:

```
tsbdrv format fast <devid> <sector_size> [-v]
```

Below table describes the parameters and sample usage of '*format fast*' command.

Argument	Description
Mandatory Parameter	

devid	Device Identifier
sector_size	Target sector size (SCSI:512/520/4096/4160, SATA:512/4096)
Optional Parameter	
-v, --verbose	Display verbose output

Note For SATA drives, change in sector size should be confirmed by checking manually using tsbdrv identify command (Word 106).

Example 1: Fast format of SCSI device

```
tsbdrv format fast sdy 512

Fast format operation started on : /dev/sdy

/dev/sdy: Fast Format command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Fast format of SATA device to 4096 sector and validation

```
tsbdrv format fast sdt 4096

Fast format operation started on : /dev/sdt

/dev/sdt: Fast Format command completed successfully.

Command return code: 0x00000000 [Command completed successfully]

tsbdrv identify sdt |grep sector
...
Logical sectors per physical sector                   0 [0x0]
Logical sector size                                   2048 [0x800]
```

Example 3: Fast format of SATA device to 512 sector and validation

```
tsbdrv format fast sdt 512

Fast format operation started on : /dev/sdt

/dev/sdt: Fast Format command completed successfully.

Command return code: 0x00000000 [Command completed successfully]

tsbdrv identify sdt |grep sector
...
Logical sectors per physical sector                    3 [0x3]
Logical sector size                                    0 [0x0]
```

5.8 Cache

Cache command is used to manage non-volatile cache on device.

The syntax for this command and its subcommands is as follows:

```
tsbdrv cache enable <devid> <mode> [-v]

tsbdrv cache disable <devid> <mode> [-v]

tsbdrv cache status <devid> [-xml] [-j] [-v]

tsbdrv cache flush <devid> [-v]
```

5.8.1 Cache enable

This command is used to enable Non-Volatile write and read cache.

The syntax for this command is as follows:

```
tsbdrv cache enable <devid> <mode> [-v]
```

Below table describes the parameters and sample usage of '*cache enable*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
mode	Cache mode: (read / write)
Optional Parameter	
-v, --verbose	Display verbose output

Note Tool doesn't send any command if cache is already enabled on device.

Example 1: Enable write cache

```
tsbdrv cache enable sdb write

/dev/sdb: Enable write cache command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
[root@WIN-6AQV2PMFSKK tsbdrv]#
```

Example 2: Enable read cache

```
/dev/sdb: Enable read cache command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

5.8.2 Cache disable

This command is used to disable Non-Volatile write and read cache.

The syntax for this command is as follows:

```
tsbdrv cache disable <devid> <mode> [-v]
```

Below table describes the parameters and sample usage of '*cache disable*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
mode	Cache mode: (read / write)
Optional Parameter	
-v, --verbose	Display verbose output

Note Tool doesn't send any command if cache is already disabled on device.

Example 1: Disable write cache

```
tsbdrv cache disable sdb write

/dev/sdb: Disable write cache command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Disable read cache

```
tsbdrv cache disable sdb read

/dev/sdb: Disable read cache command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

5.8.3 Cache status

This command is used to provide Non-volatile write and read cache support status and enable status.

The syntax for this command is as follows:

```
tsbdrv cache status <devid> [-xml] [-j] [-v]
```

Below table describes the parameters and sample usage of '*cache status*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier(Single device ID or 'all' to list cache status of all devices)
Optional Parameter	
-xml, --xml	Display XML output
-j, --json	Display JSon output
-v, --verbose	Display verbose output

Example 1: Status of cache on single device

```
tsbdrv cache status sdb
Feature status on '/dev/sdb'::

FEATURE-ID          DESCRIPTION                                SUPPORTED
VALUE/ENABLED
-------------------------------------------------------------------------------
---
wcache              Write cache                                Yes         No
rcache              Read cache                                 Yes         No

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Status of cache on all device

```
tsbdrv cache status sdb
```

```
Feature status of 'cache' (Device cache)

PHYSICAL-DRIVE    WCACHE         RCACHE
-----------------------------------------
/dev/sdb          Disabled       Enabled
/dev/sdc          Disabled       Disabled
/dev/sdd          Disabled       Enabled

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Status of cache on all devices in XML format

```
tsbdrv cache status all –xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
    <DRIVE>
        <PHYSICAL_DRIVE>/dev/sdb</PHYSICAL_DRIVE>
        <FEATURE>
            <ID>wcache</ID>
            <FEATURE_DESCRIPTION>Write cache</FEATURE_DESCRIPTION>
            <SUPPORTED>true</SUPPORTED>
            <ENABLED>false</ENABLED>
            <VALTYPE>bool</VALTYPE>
        </FEATURE>
        <FEATURE>
            <ID>rcache</ID>
            <FEATURE_DESCRIPTION>Read cache</FEATURE_DESCRIPTION>
            <SUPPORTED>true</SUPPORTED>
            <ENABLED>false</ENABLED>
            <VALTYPE>bool</VALTYPE>
        </FEATURE>
    </DRIVE>
    <DRIVE>
        <PHYSICAL_DRIVE>/dev/sdc</PHYSICAL_DRIVE>
        <FEATURE>
            <ID>wcache</ID>
            <FEATURE_DESCRIPTION>Write cache</FEATURE_DESCRIPTION>
            <SUPPORTED>true</SUPPORTED>
            <ENABLED>false</ENABLED>
            <VALTYPE>bool</VALTYPE>
        </FEATURE>
        <FEATURE>
            <ID>rcache</ID>
            <FEATURE_DESCRIPTION>Read cache</FEATURE_DESCRIPTION>
            <SUPPORTED>true</SUPPORTED>
            <ENABLED>false</ENABLED>
            <VALTYPE>bool</VALTYPE>
        </FEATURE>
    </DRIVE>
    <DRIVE>
        <PHYSICAL_DRIVE>/dev/sdd</PHYSICAL_DRIVE>
        <FEATURE>
            <ID>wcache</ID>
            <FEATURE_DESCRIPTION>Write cache</FEATURE_DESCRIPTION>
            <SUPPORTED>true</SUPPORTED>
            <ENABLED>true</ENABLED>
            <VALTYPE>bool</VALTYPE>
        </FEATURE>
        <FEATURE>
            <ID>rcache</ID>
            <FEATURE_DESCRIPTION>Read cache</FEATURE_DESCRIPTION>
            <SUPPORTED>true</SUPPORTED>
            <ENABLED>true</ENABLED>
            <VALTYPE>bool</VALTYPE>
        </FEATURE>
    </DRIVE>
</DrvCommonTool>
```


Example 3: Status of cache on single device in JSon format

```
tsbdrv cache status sdb -j
{
    "DrvCommonTool": {
        "drive": [
            {
                "physical_drive": "/dev/sdb",
                "feature": [
                    {
                        "id": "wcache",
                        "feature_description": "Write cache",
                        "supported": true,
                        "enabled": false,
                        "valtype": "bool"
                    },
                    {
                        "id": "rcache",
                        "feature_description": "Read cache",
                        "supported": true,
                        "enabled": false,
                        "valtype": "bool"
                    }
                ]
            }
        ]
    }
}
```

5.8.4 Cache flush

This command is used to flush the device cache.

The syntax for this command is as follows:

```
tsbdrv cache flush <devid> [-v]
```

Below table describes the parameters and sample usage of '*cache flush*' command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-v, --verbose	Display verbose output

Example 1: Flush cache of SATA device

```
tsbdrv cache flush sda

/dev/sda: Flush cache command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```


5.9 Feature

This command is used to manage features of device via set/get operations.

- List the supported features
- Display the current value of feature
- Set feature with new value

The syntax for this command and its subcommands is as follow:

```
tsbdrv feature list

tsbdrv feature get <devid> <feature> [-xml] [-j] [-v]

tsbdrv feature set <devid> <feature> <value> [-v]
```

5.9.1 Feature list

This command is used to list the features supported with tool.

Below table describes the sample usage of '*feature list*' command

Note

1. A device may support only subset of features listed with this command.
2. Column 'Changeable' doesn't imply that the device doesn't allow changing the feature value. This only indicates that the respective feature cannot be changed using this tool.

Example 1: Display features supported by this command set

```
tsbdrv feature list

FEATURE-ID          DESCRIPTION                              VALUE
TYPE      MIN     MAX     CHANGEABLE
-------------------------------------------------------------------------------------------
-----------------------------------
wcache              Write cache                              Enable status
Boolean   0       1       Yes
rcache              Read cache                               Enable status
Boolean   0       1       Yes
smart               SMART                                    Enable status
Boolean   0       1       No
sec                 Security                                 Enable status
Boolean   0       1       No
enhsec              Enhanced security                        Enable status
Boolean   0       1       No
pstate              Power management                         Power state
Numeric   0       31      Yes
ssc                 Spread Spectrum Clocking                 Enable status
Boolean   0       1       Yes

Note: Minimum and Maximum are boundary values; however device may support only subset of
this specified range.

Command return code: 0x00000000 [Command completed successfully]
```

5.9.2 Feature get

This command is used to display current value of feature.

The syntax for this command is as follows:

```
tsbdrv feature get <devid> <feature> [-xml] [-j] [-v]
```

Below table describes the parameters and sample usage of '*feature get*' command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
feature	Feature id (Single Feature ID or 'all' to list status of all features) [Execute 'feature list' command for feature ID]
Optional Parameter	
-xml, --xml	Display XML output
-j, --json	Display JSon output
-v, --verbose	Display verbose output

Example 1: Fetch the status of all the features on SATA device

```
tsbdrv feature get sdb all
Feature status on '/dev/sdb'::

FEATURE-ID          DESCRIPTION                                SUPPORTED   VALUE/ENABLED
-------------------------------------------------------------------------------------
wcache              Write cache                                Yes         No
rcache              Read cache                                 Yes         No
smart               SMART                                      Yes         Yes
sec                 Security                                   Yes         No
enhsec              Enhanced security                          Yes         Yes
pstate              Power management                           Yes         Standby(2)
ssc                 Spread Spectrum Clocking                   No          NA

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Fetch the status of SMART on SATA device and display in XML

```
tsbdrv feature get sda smart –xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <DRIVE>
                <PHYSICAL_DRIVE>/dev/sda</PHYSICAL_DRIVE>
                <SMART>
                        <FEATURE_DESCRIPTION>SMART</FEATURE_DESCRIPTION>
                        <SUPPORTED>Yes</SUPPORTED>
                        <ENABLED>Yes</ENABLED>
                </SMART>
        </DRIVE>
</tsbdrv>
```

Example 3: Fetch the status of all features in JSon format

```
tsbdrv feature get sdb all -j
{
    "DrvCommonTool": {
        "drive": [
            {
                "physical_drive": "/dev/sdb",
                "feature": [

                    {
                        "id": "wcache",
                        "feature_description": "Write cache",
                        "supported": true,
                        "enabled": false,
                        "valtype": "bool"
                    },
                    {
                        "id": "rcache",
                        "feature_description": "Read cache",
                        "supported": true,
                        "enabled": false,
                        "valtype": "bool"
                    },
                    {
                        "id": "smart",
                        "feature_description": "SMART",
                        "supported": true,
                        "enabled": true,
                        "valtype": "bool"
```



```
                    },
                    {
                        "id": "sec",
                        "feature_description": "Security",
                        "supported": true,
                        "enabled": false,
                        "valtype": "bool"
                    },
                    {
                        "id": "enhsec",
                        "feature_description": "Enhanced security",
                        "supported": true,
                        "enabled": true,
                        "valtype": "bool"
                    },
                    {
                        "id": "pstate",
                        "feature_description": "Power management",
                        "supported": true,
                        "value": "Active(0)/Idle(1)",
                        "valtype": "string"
                    },
                    {
                        "id": "ssc",
                        "feature_description": "Spread Spectrum Clocking",
                        "supported": false,
                        "enabled": false,
                        "valtype": "bool"
                    }
                ]
            }
        ]
    }
}
```


5.9.3 Feature set

This command is used to set feature with new value.

The syntax for this command is as follows:

```
tsbdrv feature set <devid> <feature> <value> [-v]
```

Below table describes the parameters and sample usage of '*feature set*' command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
feature	Feature id [Execute 'feature list' command for feature ID]
value	New value of the feature
Optional Parameter	
-v, --verbose	Display verbose output

Note This is not recommended to execute '*feature set*' command in parallel with any other command on same device.

Example 1: Set the value of changeable feature to new value

```
sbdrv feature set sdc pstate 1

/dev/sdc: Change device feature 'Power management' command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

5.10 Max LBA

Max LBA command is used to get/set/restore total number of user addressable sectors of the device.

It is not recommended to execute Max LBA commands for drives connected behind RAID controller.

The syntax for this command and its subcommands are as follows:

```
tsbdrv maxlba get <devid> [-xml] [-j] [-v]

tsbdrv maxlba set <devid> <num_sec> [-f] [-s] [-x] [-v]

tsbdrv maxlba restore <devid> [-s] [-v]
```

5.10.1 Max LBA get

This command is used to get the total number of user addressable sectors.

The syntax for this command is as follows:

```
tsbdrv maxlba get <devid> [-a] [-xml] [-j] [-v]
```

Below table describes the parameters and sample usage of '*maxlba get*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-a, --all	Additional Capacity Information
-xml, --xml	Display XML output
-j, --json	Display JSon output
-v, --verbose	Display verbose output

Example 1: Fetch current MAX LBA

```
tsbdrv maxlba get sdl

/dev/sdl: Capacity Information:

User Addressable Sectors: 7577248168 (Sector size: 528 bytes)
Device Size : 4000787032704 Bytes | 4000787.03 MB | 4000.79 GB | 4.00 TB
Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Fetch current MAX LBA and display in XML

```
tsbdrv maxlba get sda –xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
<DRIVE_MAX_LBA_CONFIG>
        <PHYSICAL_DRIVE>/dev/sda</PHYSICAL_DRIVE>
        <USER_ADDRESSABLE_SECTORS>3125627568</USER_ADDRESSABLE_SECTORS>
        <SECTORS_SIZE>512 bytes</SECTORS_SIZE>
</DRIVE_MAX_LBA_CONFIG>
</tsbdrv>
```

Example 3: Fetch current MAX LBA and display in JSon format

```
tsbdrv maxlba get sda –j
{
        "DrvCommonTool":{
                "drive_max_lba_config": {
                        "physical_drive" : "/dev/sda",
                        "user_addressable_sectors" : "5860533168",
                        "sector_size" : "512 bytes"
                }
        }
```



```
}
```

Example 4: Fetch current MAX LBA with additional information

```
Tsbdrv maxlba get sdl -a

/dev/sdl: Capacity Information:

User Addressable Sectors: 7577248168 (Sector size: 528 bytes)
Device Size : 4000787032704 Bytes | 4000787.03 MB | 4000.79 GB | 4.00 TB

Additional Information:
------------------------------------------------------------------------------
----
Protection Enabled (PROT_EN)                              : No
Protection Type (P_TYPE)                                  : 0 (0x0)
Protection (Information) Interval (P_I_EXPONENT)          : 0 (0x0)
Returned Logical Block Address Field (RC BASIS)           : 0 (0x0)
Logical Block Provisioning Management Enabled (LBPME)     : No
Logical Block Provisioning Read Zeros(LBPRZ)              : No
Logical Block Length (Sector Size)                        : 528 (0x210)
Logical Blocks per Physical Block Exponent                : 3 (0x3)
Effective Physical Block Length                           : 4224 (0x1080)
Number of Logical Blocks                                  : 7577248168
(0x1C3A3A1A8)
Last Logical Block Address                                : 7577248167
(0x1C3A3A1A7)
Lowest Aligned Logical Block Address                      : 0 (0x0)
------------------------------------------------------------------------------
-----
Command return code: 0x00000000 [Command completed successfully]
```

5.10.2 Max LBA set

This command is used to set total number of user addressable sectors.

The syntax for this command is as follows:

```
tsbdrv maxlba set <devid> <num_sec> [-f] [-s] [-x] [-v]
```

Below table describes the parameters and sample usage of '*maxlba set*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
num_sec	User addressable space in terms of LBA count [Min: 1]
Optional Parameter	
-f, --force	Forcibly reducing the disk size (this may cause data loss)
-s, --silent	Silent/unattended mode
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output

Note

1. -s and -f options are independent of each other.
   a. -s option skips the user confirmation step for operation.
   b. -f option forces to reduce the disk size.
   c. If -s option is used and requested disk size is less than the current disk size then operation will be aborted.
   d. Use of -s option in combination with -f option is required to force reducing disk size in an unattended mode.
2. Power cycle is required between two consecutive set or restore commands for SATA drives.
3. Sometimes failure of "maxlba set" command can bring the device to an inconsistent state. Please refer Appendix-A for steps to recover the device on respective operating system.

4. This is not recommended to execute '*maxlba set*' command in parallel with any other command on same device.
5. Decreasing disk size substantially to smaller (e.g. less than 1KB) may cause issues like disk identification failure, format failure or file system error etc.
6. For SAS device, if requested capacity is not reflecting after successful set command, issue a power cycle.
7. Do not execute MAXLBA commands on RAID configured drives connected behind PMC controllers.

Example 1: Set MAX LBA in user-attended mode

```
tsbdrv maxlba get sda

/dev/sda: No. of user addressable sectors: 1875385008 (Sectors size: 512 bytes)

Command return code: 0x00000000 [Command completed successfully]

tsbdrv maxlba set sda 187538500

This operation will change the disk size
Do you want to continue? [Y/n] y
WARNING: New disk size 187538500 is less than current size 1875385008.
         Reducing the disk size may cause data loss.
         Use option --force to forcefully reduce the size.
TSBERR66: Aborting as operation may cause data loss

Command return code: 0x00000000 [Command completed successfully]


tsbdrv maxlba set sda 187538500 -f
This operation will change the disk size
Do you want to continue? [Y/n] y
WARNING: New disk size 187538500 is less than current size 1875385008.

/dev/sda: Capacity of device is changed to '187538500' successfully.

Command return code: 0x00000000 [Command completed successfully]


tsbdrv maxlba get sda

/dev/sda: No. of user addressable sectors: 187538500 (Sectors size: 512 bytes)

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Set MAX LBA in unattended mode

```
tsbdrv maxlba get sda

/dev/sda: No. of user addressable sectors: 1875385008 (Sectors size: 512 bytes)

Command return code: 0x00000000 [Command completed successfully]


tsbdrv maxlba set sda 187538500 -f –s

WARNING: New disk size 187538500 is less than current size 1875385008.

/dev/sda: Capacity of device is changed to '187538500' successfully.


tsbdrv maxlba get sda

/dev/sda: No. of user addressable sectors: 187538500 (Sectors size: 512 bytes)

Command return code: 0x00000000 [Command completed successfully]
```


Example 3: Set MAX LBA with –x option

```
tsbdrv maxlba set 5 1875385008 -x
This operation will change the disk size
Do you want to continue? [Y/n] Y

Requested size is more than actual capacity of device. Device capacity changed to
actual capacity.

New capacity of device is changed to '1758174768'.

PHYSICALDRIVE5: Set Max LBA command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

5.10.3 Max LBA restore

This command is used to restore total number of user addressable sectors to default/maximum.

The syntax for this command is as follows:

```
tsbdrv maxlba restore <devid> [-s] [-v]
```

Below table describes the parameters and sample usage of '*maxlba restore*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-s, --silent	Silent/unattended mode
-v, --verbose	Display verbose output

Note

1. Any restore on SATA device without a "maxlba set" will fail.
2. Sometimes failure of "maxlba set" command can bring the device to an inconsistent state. Please refer Appendix-A for steps to recover the device on respective operating system.
3. This is not recommended to execute '*maxlba restore*' command in parallel with any other command on same device.
4. For SATA device, power cycle might be required between two consecutive set or restore commands.
5. If maximum drive capacity is not restored after successful command completion for SAS drives, issue a "Format start" command.

Example 1: Restoring in user-attended mode

```
tsbdrv maxlba get sda

/dev/sda: No. of user addressable sectors: 187538500 (Sectors size: 512 bytes)

Command return code: 0x00000000 [Command completed successfully]


tsbdrv maxlba restore sda

This operation will change the disk size
Do you want to continue? [Y/n] y

/dev/sda: Capacity of device is restored successfully.

Command return code: 0x00000000 [Command completed successfully]


tsbdrv maxlba get sda
```

```
/dev/sda: No. of user addressable sectors: 1875385008 (Sectors size: 512 bytes)
Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Restoring MAX LBA in unattended mode

```
tsbdrv maxlba get sda
/dev/sda: No. of user addressable sectors: 187538500 (Sectors size: 512 bytes)
Command return code: 0x00000000 [Command completed successfully]

tsbdrv maxlba restore sda -s
/dev/sda: Capacity of device is restored successfully.
Command return code: 0x00000000 [Command completed successfully]

tsbdrv maxlba get sda
/dev/sda: No. of user addressable sectors: 1875385008 (Sectors size: 512 bytes)
Command return code: 0x00000000 [Command completed successfully]
```


5.11 Logs

Logs command reads device logs and prints the Hex dump of log pages.

The syntax for this command and its subcommands are as follows:

```
tsbdrv logs directory <devid> [-a <value>] [-m] [-e] [-xml] [-j] [-hex] [-v]

tsbdrv logs read <devid> <page> [-sp <value>] [-a <value>] [-m] [-e] [-bin] [-od
<value>] [-v]

tsbdrv logs internal <devid> <mode> [-ls] [-o <value>] [-c <value>] [-bin] [-od
<value>]

tsbdrv logs vendorlog <devid> <mode> [-od <value>] [-v]
```

5.11.1 Logs directory

This command is used to display log directory information.

The syntax for this command is as follows:

```
tsbdrv logs directory <devid> [-a <value>] [-m] [-e] [-xml] [-j] [-hex] [-v]
By default the following optional parameters are specified: -a auto
```

Below table describes the parameters and sample usage of '*logs directory*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-a, --access	SATA Log access type (gpl:GPL, sl:SMART, auto: Print GPL and SMART both). (Applicable only for SATA, it will be ignored for others)
-m, --dma	Use DMA mode to read log if available (Applicable only for GPL directory on SATA , it will be ignored for others)
-e, --sme	Enable SMART feature if feature is supported and currently disabled (by default all SMART action will fail if SMART is disabled). (Applicable only for SATA, it will be ignored for others)
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output
-v, --verbose	Display verbose output

Note

1. On SATA device, if SMART feature is not supported or disabled, then
   a. if access mode is auto, SMART directory content will not be displayed
   b. if access mode is sl, operation will fail
2. If --sme option is provided then tool tries to enable SMART feature but tool doesn't disable feature back.
3. DMA mode log read request is ignored if mode is not supported by system/device.
4. Output of 'logs directory' command are different for SATA and SCSI.
   a. SATA: Fields' Page name ',' Log addresses and 'Page count' will be printed.
   b. SCSI: Fields 'Page name', 'Page' and 'Sub Page' will be printed.

Example 1: Read Log directory on with auto access

```
tsbdrv logs directory sda

Log Directory: /dev/sda
GPL Directory
PAGE NAME                                          LOG ADDRESS    PAGE COUNT
------------------------------------------------------------------------------
General Purpose Log directory                      0x00           1
```



```
Extended Comprehensive Smart Error Log          0x03          64
Device Statistics                               0x04          8
Extended Smart Self-test Log                    0x07          1
NCQ Command Error Log                           0x10          1
SATA PHY Event Counters Log                     0x11          1
Identify Device Data Log                        0x30          9
Host Specific Log                               0x80          16
Host Specific Log                               0x81          16
Host Specific Log                               0x82          16
Host Specific Log                               0x83          16
Host Specific Log                               0x84          16
Host Specific Log                               0x85          16
Host Specific Log                               0x86          16
Host Specific Log                               0x87          16
Host Specific Log                               0x88          16
Host Specific Log                               0x89          16
Host Specific Log                               0x8A          16
Host Specific Log                               0x8B          16
Host Specific Log                               0x8C          16
Host Specific Log                               0x8D          16
Host Specific Log                               0x8E          16
Host Specific Log                               0x8F          16
Host Specific Log                               0x90          16
Host Specific Log                               0x91          16
Host Specific Log                               0x92          16
Host Specific Log                               0x93          16
Host Specific Log                               0x94          16
Host Specific Log                               0x95          16
Host Specific Log                               0x96          16
Host Specific Log                               0x97          16
Host Specific Log                               0x98          16
Host Specific Log                               0x99          16
Host Specific Log                               0x9A          16
Host Specific Log                               0x9B          16
Host Specific Log                               0x9C          16
Host Specific Log                               0x9D          16
Host Specific Log                               0x9E          16
Host Specific Log                               0x9F          16
SCT Command/status Log                          0xE0          1
SCT Data Transfer Log                           0xE1          1
------------------------------------------------------------------------------

SMART Log Directory
PAGE NAME                                       LOG ADDRESS   PAGE COUNT
------------------------------------------------------------------------------
SMART Log directory                             0x00          1
Summary Smart Error Log                         0x01          1
Comprehensive Smart Error Log                   0x02          51
Device Statistics                               0x04          8
Smart Self-test Log                             0x06          1
Selective Self-test Log                         0x09          1
Identify Device Data Log                        0x30          9
Host Specific Log                               0x80          16
Host Specific Log                               0x81          16
Host Specific Log                               0x82          16
Host Specific Log                               0x83          16
Host Specific Log                               0x84          16
Host Specific Log                               0x85          16
Host Specific Log                               0x86          16
Host Specific Log                               0x87          16
Host Specific Log                               0x88          16
Host Specific Log                               0x89          16
Host Specific Log                               0x8A          16
Host Specific Log                               0x8B          16
Host Specific Log                               0x8C          16
Host Specific Log                               0x8D          16
Host Specific Log                               0x8E          16
Host Specific Log                               0x8F          16
Host Specific Log                               0x90          16
```



```
Host Specific Log                                       0x91          16
Host Specific Log                                       0x92          16
Host Specific Log                                       0x93          16
Host Specific Log                                       0x94          16
Host Specific Log                                       0x95          16
Host Specific Log                                       0x96          16
Host Specific Log                                       0x97          16
Host Specific Log                                       0x98          16
Host Specific Log                                       0x99          16
Host Specific Log                                       0x9A          16
Host Specific Log                                       0x9B          16
Host Specific Log                                       0x9C          16
Host Specific Log                                       0x9D          16
Host Specific Log                                       0x9E          16
Host Specific Log                                       0x9F          16
SCT Command/status Log                                  0xE0          1
SCT Data Transfer Log                                   0xE1          1
------------------------------------------------------------------------------

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Display SMART Log directory in XML format

```
tsbdrv logs directory sdb -a sl -xml
<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
    <DRIVE>
        <PHYSICAL_DRIVE>/dev/sdb</PHYSICAL_DRIVE>
        <LOG_DIRECTORY>
            <SMART>
                <PAGE_NAME>SMART Log directory</PAGE_NAME>
                <LOG_PAGE>0</LOG_PAGE>
                <PAGE_COUNT>1</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Summary Smart Error Log</PAGE_NAME>
                <LOG_PAGE>1</LOG_PAGE>
                <PAGE_COUNT>1</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Comprehensive Smart Error Log</PAGE_NAME>
                <LOG_PAGE>2</LOG_PAGE>
                <PAGE_COUNT>51</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Device Statistics</PAGE_NAME>
                <LOG_PAGE>4</LOG_PAGE>
                <PAGE_COUNT>8</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Smart Self-test Log</PAGE_NAME>
                <LOG_PAGE>6</LOG_PAGE>
                <PAGE_COUNT>1</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Selective Self-test Log</PAGE_NAME>
                <LOG_PAGE>9</LOG_PAGE>
                <PAGE_COUNT>1</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>128</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>129</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
```



```
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>130</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>131</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>132</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>133</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>134</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>135</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>136</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>137</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>138</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>139</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>140</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>141</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>142</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
    <SMART>
        <PAGE_NAME>Host Specific Log</PAGE_NAME>
        <LOG_PAGE>143</LOG_PAGE>
        <PAGE_COUNT>16</PAGE_COUNT>
    </SMART>
```



```
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>144</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>145</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>146</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>147</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>148</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>149</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>150</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>151</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>152</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>153</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>154</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>155</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>156</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>157</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
```



```
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>158</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>Host Specific Log</PAGE_NAME>
                <LOG_PAGE>159</LOG_PAGE>
                <PAGE_COUNT>16</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>SCT Command/status Log</PAGE_NAME>
                <LOG_PAGE>224</LOG_PAGE>
                <PAGE_COUNT>1</PAGE_COUNT>
            </SMART>
            <SMART>
                <PAGE_NAME>SCT Data Transfer Log</PAGE_NAME>
                <LOG_PAGE>225</LOG_PAGE>
                <PAGE_COUNT>1</PAGE_COUNT>
            </SMART>
        </LOG_DIRECTORY>
    </DRIVE>
</DrvCommonTool>
```

Example 3: Display SCSI Log directory

```
tsbdrv logs directory sdb

Log Directory: /dev/sdb
SCSI Log Directory
PAGE NAME                                                PAGE    SUB PAGE
-------------------------------------------------------------------------
Log Directory                                            0x00    0x00
Log Directory (Subpages)                                 0x00    0xFF
Write Error Counter                                      0x02    0x00
Write Error Counter (Subpages)                           0x02    0xFF
Read Error Counter                                       0x03    0x00
Read Error Counter (Subpages)                            0x03    0xFF
Verify Error Counter                                     0x05    0x00
Verify Error Counter (Subpages)                          0x05    0xFF
Non-Medium Error                                         0x06    0x00
Non-Medium Error (Subpages)                              0x06    0xFF
Logical Block Provisioning                               0x0C    0x00
Logical Block Provisioning (Subpages)                    0x0C    0xFF
Temperature                                              0x0D    0x00
Temperature (Subpages)                                   0x0D    0xFF
Start-Stop Cycle Counter                                 0x0E    0x00
Start-Stop Cycle Counter (Subpages)                      0x0E    0xFF
Application Client                                       0x0F    0x00
Application Client (Subpages)                            0x0F    0xFF
Self-Test Results                                        0x10    0x00
Self-Test Results (Subpages)                             0x10    0xFF
Solid State Media                                        0x11    0x00
Solid State Media (Subpages)                             0x11    0xFF
Protocol Specific Port                                   0x18    0x00
Protocol Specific Port (Subpages)                        0x18    0xFF
Statistics                                               0x19    0x00
Statistics (Subpages)                                    0x19    0xFF
Power Condition Transitions                              0x1A    0x00
Power Condition Transitions (Subpages)                   0x1A    0xFF
Informational Exceptions                                 0x2F    0x00
Informational Exceptions (Subpages)                      0x2F    0xFF
Vendor specific                                          0x30    0x00
Vendor specific (Subpages)                               0x30    0xFF
Vendor specific                                          0x38    0x00
Vendor specific (Subpages)                               0x38    0xFF
Background Scan Results                                  0x15    0x02
Background Scan Results (Subpages)                       0x15    0xFF

Command return code: 0x00000000 [Command completed successfully]
```


5.11.2 Logs read

This command prints the content of the log page in hex dump format.

The syntax for this command is as follows:

```
tsbdrv logs read <devid> <page> [-sp <value>] [-a <value>] [-m] [-e] [-nohex] [-bin] [-od <value>] [-v]
```

```
By default the following optional parameters are specified: -sp 0 -a auto -od ""
```

Below table describes the parameters and sample usage of '*logs read*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
page	Log page in decimal format or hexadecimal (prefix with 0x) [Min:0x0, Max:0xFF]
Optional Parameter	
-sp, --subpage	Single log page in decimal or hexadecimal (prefix with 0x) or Multiple log pages as comma separated list (e.g. 0x1,0x2,0x5) or range (e.g. 0x1-0xA) [Min: 0x0, Max: 0xFFFF] (Applicable only for SATA and SCSI, it will be ignored for others)
-a, --access	SATA Log access type (gpl:GPL, sl:SMART, auto: SMART if applicable otherwise GPL). (Applicable only for SATA, it will be ignored for others)
-m, --dma	Use DMA mode to read log if available (Applicable only for GPL on SATA , it will be ignored for others)
-e, --sme	Enable SMART feature if feature is supported and currently disabled (By default all SMART action will fail if SMART is disabled). (Applicable only for SATA, it will be ignored for others)
-bin, --bin_dump	Create binary dump file(s)
-od, --out_dir	Output directory (By default binary log file(s) will be created in current working directory)
-nohex, --nohex	Do not print hex-dump of log content on console (ignored if -bin/--bin_dump option is not provided)
-v, --verbose	Display verbose output

Note

1. Argument for --subpage can be passed in either of the following formats
   a. Single log page (e.g. 0x01)
   b. List of log pages with comma separation (e.g. 0x01,0x04,0x07)
   c. Range of log pages with hyphen separation (e.g. 4-7 which means 4,5,6,7)
   d. List of log pages or ranges (e.g. 0,2-4,7,9-11)
2. If SMART feature is not supported or currently, it is in disabled state and access mode is sl, then operation will fail.
3. If --sme option is provided then tool tries to enable SMART feature but tool doesn't disable feature back.
4. SMART access on GPL only log address and GPL access on SMART only log address will fail.
5. While reading a log page from SATA device, if access mode parameter is not provided and specified log address supports both GPL and SMART access, then
   a. SMART READ LOG will be used if SMART feature is supported and enabled.
   b. READ LOG EXT will be used if SMART feature is not supported or currently disabled.
6. DMA mode log read request is ignored if mode is not supported by system/device.
7. Refer the output of command 'tsbdrv logs directory <devid>' to get page address and sub-page range.

Example 1: Read single log page from SATA in auto mode

```
tsbdrv logs read sdc 0x04 -sp 0x01

Device Statistics:General Statistics [Page: 0x04, SubPage: 0x0001] Hex-Dump
------------------------------------------------------------
00000000: 02 00 01 00 00 00 00 00 3a 00 00 00 00 00 00 c0   '........:.......'
00000010: 21 29 00 00 00 00 00 00 be 8f 58 90 05 00 00 c0   '!).........X.....'
...
...
Output Snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
------------------------------------------------------------

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Read multiple log pages from SATA in GPL mode

```
tsbdrv logs read sdc 0x04 -sp 0x01,0x02-0x04 -a gpl

Device Statistics:General Statistics [Page: 0x04, SubPage: 0x0001] Hex-Dump
------------------------------------------------------------
00000000: 02 00 01 00 00 00 00 00 3a 00 00 00 00 00 00 c0   '........:.......'
00000010: 21 29 00 00 00 00 00 00 be 8f 58 90 05 00 00 c0   '!).........X.....'
00000020: 05 ce 52 8d 00 00 00 c0 e6 17 ed 3a 01 00 00 c0   '..R........:....'
00000030: 71 69 5a 02 00 00 00 c0 00 00 00 00 00 00 00 00   'qiZ.............'
00000040: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
...
...
Output Snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
------------------------------------------------------------
Device Statistics:Free Fall Statistics [Page: 0x04, SubPage: 0x0002] Hex-Dump
------------------------------------------------------------
00000000: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
00000010: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
...
...
Output Snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
------------------------------------------------------------
Device Statistics:Rotating Media Statistics [Page: 0x04, SubPage: 0x0003] Hex-Dump
------------------------------------------------------------
00000000: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
00000010: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
...
...
Output Snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
------------------------------------------------------------
Device Statistics:General Errors Statistics [Page: 0x04, SubPage: 0x0004] Hex-Dump
------------------------------------------------------------
00000010: 00 00 00 00 00 00 00 c0 00 00 00 00 00 00 00 00  '................'
00000020: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
...
...
Output Snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  '................'
```



```
-------------------------------------------------------

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Read single log page from SAS

```
tsbdrv logs read sdb 0x03 -sp 0x00

Read Error Counter [Page: 0x03, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------
00000000: 03 00 00 36 00 00 00 04 00 00 00 00 00 01 00 04   '...6............'
00000010: 00 00 00 52 00 02 00 04 00 00 00 3f 00 03 00 04   '...R.......?....'
00000020: 00 00 00 00 00 05 00 0a 00 00 00 00 3d 18 53 5e   '............=.S^'
00000030: 40 00 00 06 00 04 00 00 00 3f                     '@........?'
-------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

Example 5: Read single log page from SATA and create binary dump of the same

```
tsbdrv logs read sdb 0x0 -bin -od /home

SMART Log directory [Page: 0x00, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------
00000000: 01 00 01 00 33 00 00 00 08 00 00 00 01 00 00 00   '....3...........'
00000010: 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
...
...
Output Snippet
...
000001e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
000001f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
-------------------------------------------------------

[Page:0x00, Subpage:0x0000] Binary dump file: '/home/tsbdrv-sdb-00-00-
1478768931.bin'
Command return code: 0x00000000 [Command completed successfully]
```

Example 6: Read multiple log pages from SATA and create binary dump without printing hexdump on screen

```
tsbdrv logs read /dev/sda 0x03 -sp 0-63 -bin –nohex

Binary dump file: './tsbdrv-dev_sda-03-00-1517560279.bin'

Command return code: 0x00000000 [Command completed successfully]
```

5.11.3 Logs internal

This command reads the internal log pages of device and prints the hex dump of the same.

The syntax for this command is as follows:

```
tsbdrv logs internal <devid> <mode> [-ls] [-o <value>] [-c <value>] [-nohex] [-bin]
[-od <value>]
By default, the following optional parameters are specified: -o 0 -c 0 -od ""
```

Below table describes the parameters and sample usage of '*logs internal*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Mode	Internal log mode (DS:SAS Drive status, WLL:SAS Extended drive history, DCS: SAS device current state, DI:SAS drive internal, CMD:SAS command, EDD:SAS controller internal info, TLL: SAS Time Line log info, II: SAS Inside Information log,

	FIR: SAS FIR Dump Log, RI:SAS Request Internal log all modes, A1:SATA Internal log area1, A2:SATA Internal log area2, A3:SATA Internal log area3)
Optional Parameter	
-ls, --logsize	Print log size (in term of page count for SATA/in term of bytes for SAS) instead of log buffer (All other valid arguments will be ignored)
-o, --offset	Offset value (in term of page start for SATA/in term of bytes for SAS) from the head of the data to receive
-c, --count	Count (in term of pages for SATA/in term of bytes for SAS) to be transmitted from device (0 means complete log from offset will be transmitted)
-nohex, --nohex	Do not print hex-dump of log content on console (ignored if -bin/--bin_dump option is not provided)
-bin, --bin_dump	Create binary dump file(s)
-od, --out_dir	Output directory (By default binary log file(s) will be created in current working directory)

Note For SAS devices, offset value is recommended multiple of 8 only.

Example 1: Print Drive internal logs of SCSI device

```
tsbdrv logs internal sdc CMD

Command Log [Page: 0x04, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------
00000000: 04 04 7e e4 04 04 7e e0 00 01 3f ec 69 2b 03 01   '..~...~...?.i+..'
00000010: 0c 0c 00 00 87 00 27 01 00 00 00 00 00 00 00 00   '......'.........'
00000020: 00 00 00 00 00 00 00 00 ff 26 00 00 01 00 00 00   '.........&......'
...
...
Output Snippet
...
00047ec0: c6 00 00 00 54 67 54 67 12 00 00 00 4a 00 00 00   '....TgTg....J...'
00047ed0: 00 00 00 00 00 00 00 00 52 27 00 00 02 01 00 00   '........R'......'
00047ee0: cb 00 00 00                                       '....'
-------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Print 100 bytes of Drive internal logs of SCSI device

```
tsbdrv logs internal sdc CMD -c 100

Command Log [Page: 0x04, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------
00000000: 04 04 7e e4 04 04 7e e0 00 01 3f ec 69 2b 03 01   '..~...~...?.i+..'
00000010: 0c 0c 00 00 87 00 27 01 00 00 00 00 00 00 00 00   '......'.........'
00000020: 00 00 00 00 00 00 00 00 ff 26 00 00 01 00 00 00   '.........&......'
00000030: cd 00 00 00 54 67 54 67 88 00 00 00 10 00 00 00   '....TgTg........'
00000040: 00 00 00 00 08 00 00 00 18 27 00 02 00 01 31 03   '.........'....1.'
00000050: cc 00 00 00 54 67 54 67 a3 0c 02 9e 00 10 00 00   '....TgTg........'
00000060: 00 04 00 00                                       '....'
-------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Print Drive internal logs of SCSI device with nonzero offset

```
tsbdrv logs internal sdc CMD -o 128

Command Log [Page: 0x04, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------
00000000: 00 00 00 00 08 00 00 00 cf 26 00 02 00 01 31 03   '.........&....1.'
00000010: c2 00 00 00 3b 67 3b 67 88 00 00 00 00 00 00 00   '....;g;g........'
...
...
```



```
Output Snippet
...
00000130: cb 00 00 00                                           '....'
-------------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Print Drive internal log size of SCSI device

```
tsbdrv logs internal 8 DS -ls

[PHYSICALDRIVE8] Internal log (mode 'DS') size: 4448624 bytes

Command return code: 0x00000000 [Command completed successfully]
```

Example 5 : Read SATA internal area 1 log page

```
tsbdrv logs internal 0 A1 -o 0 -c 2
Current Device Internal Status Data Area 1 [Page: 0x24, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------------
00000000: 24 00 00 00 39 00 00 00 ff 02 ff 3f ff 3f 00 00   '$...9......?.?..'
00000010: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
...
Output Snippet
...
000003e0: 7f de 16 ec 76 b7 f4 ab 2b 58 c9 1f 22 a5 95 28   '....v...+X.."..('
000003f0: 42 a0 be 22 f8 87 b5 6b 9c 02 c4 75 cb 75 f7 48   'B.."...k...u.u.H'
-------------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

Example 6: Read SATA internal area 2 log page

```
tsbdrv logs internal 0 A2 -o 0 -c 2
Current Device Internal Status Data Area 1 [Page: 0x24, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------------
00000000: 24 00 00 00 39 00 00 00 ff 02 ff 3f ff 3f 00 00   '$...9......?.?..'
00000010: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
...
Output Snippet
...
000003e0: 7f de 16 ec 76 b7 f4 ab 2b 58 c9 1f 22 a5 95 28   '....v...+X.."..('
000003f0: 42 a0 be 22 f8 87 b5 6b 9c 02 c4 75 cb 75 f7 48   'B.."...k...u.u.H'
-------------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

Example 7: Read 100 bytes of current state log page from SAS Drive

```
tsbdrv logs internal sdi DCS -o 0 -c 100
Unknown [Page: 0x20, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------------
00000000: 20 96 78 b4 20 96 78 b0 00 00 00 00 81 03 04 00   ' .x. .x.........'
00000010: 36 38 50 30 41 30 30 46 46 31 50 46 48 53 54 20   '68P0A00FF1PFHST '
00000020: 20 20 20 20 00 00 00 00 40 00 00 00 14 76 12 11   '    ....@....v..'
00000030: 02 14 12 81 12 80 0f ff 22 02 22 22 22 00 00 00   '........"."""...'
00000040: 00 00 00 00 00 00 00 00 00 09 08 0b 05 08 ff 06   '................'
00000050: 07 04 01 02 03 00 ff ff ff ff ff ff 00 01 ff 02   '................'
00000060: 03 04 05 06                                       '....'
-------------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

Example 8: Read 100 bytes of Request Internal log from SAS Drive

```
tsbdrv logs internal sds RI -o 0
[Page: 0x00, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------------
00000000: 01 0f a8 d4 01 0f a8 d0 4c 4f 47 20 39 5c 00 00   '........LOG 9\..'
00000010: ff ff ff fc 00 0d cf e0 54 69 6d 65 00 00 00 38   '........Time...8'
00000020: a4 c8 ba 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
00000030: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
```



```
00000040: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
00000050: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   '................'
00000060: 00 00 00 00 06                                       '....'
------------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully
```

Example 9: Request Internal log mode is given for SATA drive [Invalid model for RI]

```
tsbdrv logs internal sdb RI -bin -nohex

Command return code: 0x80002300
TSBERR35: Invalid parameter value

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1611731974-4166.log' for details.
```

Example 10: Print FIR Dump log for SAS drive

```
tsbdrv logs internal sdj FIR
FIR Dump Log [Page: 0x14, SubPage: 0x0000] Hex-Dump
------------------------------------------------------------
00000000: 14 05 60 04 14 05 60 00 46 44 4c 30 00 00 00 00
'..`...`.FDL0....'
00000010: 00 00 00 00 00 05 5e 00 00 00 00 00 00 00 02 18
'......^.........'
00000020: 00 00 00 00 00 00 02 18 00 02 f4 c5 00 24 78 00
'.............$x.'
00000030: 03 11 01 c0 00 00 00 00 ff ff ff ff ff ff ff ff
'................'
00000040: ff ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
'................'
00000050: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
'................'
00000060: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
[    ]
00056000: 00 00 00 00 00 00 00 00                          '........'
------------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

5.11.4 Logs vendorlog

This command is used to dump the vendor specific log pages(s) in a binary file. This command is only for the drive with special Firmware which support command sequence log pages.

The syntax for this command is as follows:

```
tsbdrv logs vendorlog <devid> <mode> [-od <value>] [-v]

By default, the following optional parameters are specified: -od ""
```

Below table describes the parameters and sample usage of *'logs vendorlog'* command.

Argument	Description
Mandatory Parameter	
devid	Device identifier
mode	Log mode (CSL: Command Sequence Log, MFM: FIR Dump Log)
Optional Parameter	
-od, --out_dir	Output directory (By default binary log file(s) will be created in current working directory).
-v, --verbose	Display verbose output

Example 1: Dump command sequence log of SATA or SAS drive

```
tsbdrv logs vendorlog sdr CSL

Binary dump file (mode 'CSL') : './tsbdrv-1600840110-dev_sdr-01-88W0A01SF4RG.bin'
Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Dump command sequence log of SATA drive using 'od' option

```
tsbdrv logs vendorlog sdr CSL –od logs/

Binary dump file (mode 'CSL') : 'logs/tsbdrv-1600228865-dev_sdo-01-
88W0A01SF4RG.bin'
Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Dump command sequence log of SATA drive on freebsd OS

```
tsbdrv logs vendorlog ada1 CSL

Binary dump file (mode 'CSL') : './tsbdrv-1643335841-dev_ada1-01-
Z850A02RFMSG.bin'
Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Invalid mode

```
tsbdrv logs vendorlog sdr invalid

Command return code: 0x80002300
TSBERR35: Invalid parameter value

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1600844090-30883.log' for details.
```

Example 5: Drive Firmware not supporting CSL

```
tsbdrv logs vendorlog sda CSL
Command return code: 0x80005300
TSBERR83: Feature unsupported
See log file '/var/log/toshiba/tsbdrv/tsbdrv-1629980800-5992.log' for details.
```

Example 6: Dump FIR log of SATA drive

```
tsbdrv logs vendorlog sdr MFM

Binary dump file (mode 'MFM') : './tsbdrv-1677042888-dev_sdr-02-12X0A003FPPH.bin'
Command return code: 0x00000000 [Command completed successfully]
```

Example 7: Dump FIR log of SATA drive using –log option

```
tsbdrv logs vendorlog sdr MFM -log

Binary dump file (mode 'MFM') : './tsbdrv-1674647393-dev_sdr-02-12X0A003FPPH.bin'
Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1674647392-10411.log' for details.
```


5.12 Mode

This command is used to manage SCSI mode parameters. This command serves below purposes:

- Print mode directory
- Print mode descriptor values
- Print mode parameter values
- Change mode parameter values

The syntax for this command and its subcommands is as follows:

```
tsbdrv mode directory <devid> [-xml] [-j] [-hex] [-v]

tsbdrv mode desc <devid> [-hdr] [-xml] [-j] [-hex] [-v]

tsbdrv mode get <devid> <page> [-sp <value>] [-hdr] [-xml] [-j] [-hex] [-v]

tsbdrv mode set <devid> <page> <params> [-sp <value>] [-v]

tsbdrv mode setfield <devid> <page> <offset> <mask> <value> [-sp <value>] [-v]
```

5.12.1 Mode directory

This command is used to print mode directory.

The syntax for this command is as follows:

```
tsbdrv mode directory <devid> [-xml] [-j] [-hex] [-v]
```

Below table describes the parameters and sample usage of '*mode directory*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output
-v, --verbose	Display verbose output

Example 1: Print mode directory of SCSI device.

```
tsbdrv mode directory PHYSICALDRIVE15
::[PHYSICALDRIVE15]:Mode directory::
Page name                                                    Page    Sub-Page
-------------------------------------------------------------------------
Read-Write Error Recovery mode page                          0x01    0x00
Disconnect-Reconnect mode page                               0x02    0x00
Format Device mode page                                      0x03    0x00
Rigid Disk Geometry mode page                                0x04    0x00
Verify Error Recovery mode page                              0x07    0x00
Caching mode page                                            0x08    0x00
Control mode page                                            0x0A    0x00
Control Extension mode page                                  0x0A    0x01
Protocol-Specific Logical Unit mode page                     0x18    0x00
Protocol-Specific Port mode page0x00                         0x19    0x00
Protocol-Specific Port mode page0x01-Subpage:0x01 0x19    0x01
Protocol-Specific Port mode page0x02-Subpage:0x02 0x19    0x02
Protocol-Specific Port mode page0x03-Subpage:0x03 0x19    0x03
Power Condition mode page                                    0x1A    0x00
Power Consumption mode page                                  0x1A    0x01
Informational Exceptions Control mode page                   0x1C    0x00
```



```
Restricted-Page:0x24-Subpage:0x00                  0x24    0x00
Restricted-Page:0x24-Subpage:0x01                  0x24    0x01

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Print mode directory of SCSI device in XML format

```
tsbdrv mode directory PHYSICALDRIVE15 -xml
<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <MODE_DIRECTORY>
                <PHYSICAL_DRIVE>PHYSICALDRIVE3</PHYSICAL_DRIVE>
                <READ_WRITE_ERROR_RECOVERY_MODE_PAGE>
                        <PAGE>0x01</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </READ_WRITE_ERROR_RECOVERY_MODE_PAGE>
                <DISCONNECT_RECONNECT_MODE_PAGE>
                        <PAGE>0x02</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </DISCONNECT_RECONNECT_MODE_PAGE>
                <FORMAT_DEVICE_MODE_PAGE>
                        <PAGE>0x03</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </FORMAT_DEVICE_MODE_PAGE>
                <RIGID_DISK_GEOMETRY_MODE_PAGE>
                        <PAGE>0x04</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </RIGID_DISK_GEOMETRY_MODE_PAGE>
                <VERIFY_ERROR_RECOVERY_MODE_PAGE>
                        <PAGE>0x07</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </VERIFY_ERROR_RECOVERY_MODE_PAGE>
                <CACHING_MODE_PAGE>
                        <PAGE>0x08</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </CACHING_MODE_PAGE>
                <CONTROL_MODE_PAGE>
                        <PAGE>0x0A</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </CONTROL_MODE_PAGE>
                <CONTROL_EXTENSION_MODE_PAGE>
                        <PAGE>0x0A</PAGE>
                        <SUB_PAGE>0x01</SUB_PAGE>
                </CONTROL_EXTENSION_MODE_PAGE>
                <PROTOCOL_SPECIFIC_LOGICAL_UNIT_MODE_PAGE>
                        <PAGE>0x18</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </PROTOCOL_SPECIFIC_LOGICAL_UNIT_MODE_PAGE>
                <PROTOCOL_SPECIFIC_PORT_MODE_PAGE0x00>
                        <PAGE>0x19</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </PROTOCOL_SPECIFIC_PORT_MODE_PAGE0x00>
                <PROTOCOL_SPECIFIC_PORT_MODE_PAGE0x01_SUBPAGE_0x01>
                        <PAGE>0x19</PAGE>
                        <SUB_PAGE>0x01</SUB_PAGE>
                </PROTOCOL_SPECIFIC_PORT_MODE_PAGE0x01_SUBPAGE_0x01>
                <PROTOCOL_SPECIFIC_PORT_MODE_PAGE0x02_SUBPAGE_0x02>
                        <PAGE>0x19</PAGE>
                        <SUB_PAGE>0x02</SUB_PAGE>
                </PROTOCOL_SPECIFIC_PORT_MODE_PAGE0x02_SUBPAGE_0x02>
                <PROTOCOL_SPECIFIC_PORT_MODE_PAGE0x03_SUBPAGE_0x03>
                        <PAGE>0x19</PAGE>
                        <SUB_PAGE>0x03</SUB_PAGE>
                </PROTOCOL_SPECIFIC_PORT_MODE_PAGE0x03_SUBPAGE_0x03>
                <POWER_CONDITION_MODE_PAGE>
                        <PAGE>0x1A</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </POWER_CONDITION_MODE_PAGE>
                <POWER_CONSUMPTION_MODE_PAGE>
```



```
                        <PAGE>0x1A</PAGE>
                        <SUB_PAGE>0x01</SUB_PAGE>
                </POWER_CONSUMPTION_MODE_PAGE>
                <INFORMATIONAL_EXCEPTIONS_CONTROL_MODE_PAGE>
                        <PAGE>0x1C</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </INFORMATIONAL_EXCEPTIONS_CONTROL_MODE_PAGE>
                <RESTRICTED_PAGE_0x24_SUBPAGE_0x00>
                        <PAGE>0x24</PAGE>
                        <SUB_PAGE>0x00</SUB_PAGE>
                </RESTRICTED_PAGE_0x24_SUBPAGE_0x00>
                <RESTRICTED_PAGE_0x24_SUBPAGE_0x01>
                        <PAGE>0x24</PAGE>
                        <SUB_PAGE>0x01</SUB_PAGE>
                </RESTRICTED_PAGE_0x24_SUBPAGE_0x01>
        </MODE_DIRECTORY>
</TSBDRV>
```

Example 3: Print mode directory of SCSI device in JSon format

```
tsbdrv mode directory PHYSICALDRIVE15 –j
{
        “DrvCommonTool”:{
                "mode_directory": {
                        "physical_drive" : "PHYSICALDRIVE3",
                        "read_write_error_recovery_mode_page": {
                                "page" : "0x01",
                                "sub_page" : "0x00"
                        },
                        "disconnect_reconnect_mode_page": {
                                "page" : "0x02",
                                "sub_page" : "0x00"
                        },
                        "format_device_mode_page": {
                                "page" : "0x03",
                                "sub_page" : "0x00"
                        },
                        "rigid_disk_geometry_mode_page": {
                                "page" : "0x04",
                                "sub_page" : "0x00"
                        },
                        "verify_error_recovery_mode_page": {
                                "page" : "0x07",
                                "sub_page" : "0x00"
                        },
                        "caching_mode_page": {
                                "page" : "0x08",
                                "sub_page" : "0x00"
                        },
                        "control_mode_page": {
                                "page" : "0x0A",
                                "sub_page" : "0x00"
                        },
                        "control_extension_mode_page": {
                                "page" : "0x0A",
                                "sub_page" : "0x01"
                        },
                        "protocol_specific_logical_unit_mode_page": {
                                "page" : "0x18",
                                "sub_page" : "0x00"
                        },
                        "protocol_specific_port_mode_page0x00": {
                                "page" : "0x19",
                                "sub_page" : "0x00"
                        },
                        "protocol_specific_port_mode_page0x01_subpage_0x01": {
                                "page" : "0x19",
                                "sub_page" : "0x01"
                        },
```



```
                        "protocol_specific_port_mode_page0x02_subpage_0x02": {
                                "page" : "0x19",
                                "sub_page" : "0x02"
                        },
                        "protocol_specific_port_mode_page0x03_subpage_0x03": {
                                "page" : "0x19",
                                "sub_page" : "0x03"
                        },
                        "power_condition_mode_page": {
                                "page" : "0x1A",
                                "sub_page" : "0x00"
                        },
                        "power_consumption_mode_page": {
                                "page" : "0x1A",
                                "sub_page" : "0x01"
                        },
                        "informational_exceptions_control_mode_page": {
                                "page" : "0x1C",
                                "sub_page" : "0x00"
                        },
                        "restricted_page_0x24_subpage_0x00": {
                                "page" : "0x24",
                                "sub_page" : "0x00"
                        },
                        "restricted_page_0x24_subpage_0x01": {
                                "page" : "0x24",
                                "sub_page" : "0x01"
                        }
                }
        }
}
```

Example 4: Print mode directory of SCSI device in hexdump format

```
tsbdrv mode directory PHYSICALDRIVE15 –hex
Mode directory [Page: 0x3F, SubPage: 0x00FF] Hex-Dump
------------------------------------------------------------
00000000: 01 86 00 10 00 00 00 00 81 0a c0 ff ff 00 00 00   '................'
00000010: 3f 00 1f 40 82 0e 00 00 00 0a 00 00 00 00 00 00   '?..@............'
00000020: 00 00 00 00 83 16 01 a0 00 00 00 00 00 50 0b a1   '.............P..'
00000030: 02 00 00 01 02 ca 01 22 40 00 00 00 84 16 05 04   '.......”@.......'
00000040: 66 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00   'f...............'
...
...
Output Snippet
...
00000170: 00 00 00 00 dc 01 00 0c 01 00 00 18 00 00 00 fa   '................'
00000180: 07 d0 00 00 a1 02 0f 00                           '........'
------------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

5.12.2 Mode desc

This command is used to print mode descriptor values.

The syntax for this command is as follows:

```
tsbdrv mode desc <devid> [-hdr] [-xml] [-j] [-hex] [-v]
```

Below table describes the parameters and sample usage of '*mode desc*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	

-hdr, --header	Prints mode data header along with mode data descriptor
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output
-v, --verbose	Display verbose output

Example 1: Print mode descriptor value of SCSI device.

```
tsbdrv mode desc PHYSICALDRIVE15
::[PHYSICALDRIVE15]:SCSI Mode block descriptor::
                                                                                |
Values                   |
Parameter                                                       Key name    |Current
Default     Saved       Changeable| Max value
--------------------------------------------------------------------------------
------------------------------------------------
Parameter:Number of logical blocks                              NLB
1953525168  0           0           No          NA
Parameter:Logical block length                                  LBL          512
0           0           No          NA

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Print mode descriptor value along with data header of SCSI device.

```
tsbdrv mode desc PHYSICALDRIVE15 -hdr
::[PHYSICALDRIVE15]:SCSI Mode block descriptor::
                                                                                |
Values                   |
Parameter                                                       Key name    |Current
Default     Saved       Changeable| Max value
--------------------------------------------------------------------------------
------------------------------------------------
Header:Mode Data Length                                         MODELEN      22
0           0           No          NA
Header:Medium Type                                              MTYPE        0
0           0           No          NA
Header:Write Protected                                          W_PROT       0
0           0           No          NA
Header:DPO and FUA supported                                    DPO_FUA      0
0           0           No          NA
Header:Long LBA                                                 LLBA         1
0           0           No          NA
Header:Block Descriptor Length                                  BDL          16
0           0           No          NA
Parameter:Number of logical blocks                              NLB
1953525168  0           0           No          NA
Parameter:Logical block length                                  LBL          512
0           0           No          NA

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Print mode descriptor value along with data header in XML format of SCSI device.

```
tsbdrv mode desc PHYSICALDRIVE15 -hdr -xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <MODE_DATA>
                <PHYSICAL_DRIVE>PHYSICALDRIVE15</PHYSICAL_DRIVE>
                <PAGE_NAME>SCSI Mode block descriptor</PAGE_NAME>
                <HEADER>
                        <MODE_DATA_LENGTH>
                                <KEY_NAME>MODELEN</KEY_NAME>
                                <VALUE>22 [0x16]</VALUE>
                                <CHANGEABLE>No</CHANGEABLE>
                        </MODE_DATA_LENGTH>
                        <MEDIUM_TYPE>
```



```
                                <KEY_NAME>MTYPE</KEY_NAME>
                                <VALUE>0 [0x0]</VALUE>
                                <CHANGEABLE>No</CHANGEABLE>
                        </MEDIUM_TYPE>
                        <WRITE_PROTECTED>
                                <KEY_NAME>W_PROT</KEY_NAME>
                                <VALUE>0 [0x0]</VALUE>
                                <CHANGEABLE>No</CHANGEABLE>
                        </WRITE_PROTECTED>
                        <DPO_AND_FUA_SUPPORTED>
                                <KEY_NAME>DPO_FUA</KEY_NAME>
                                <VALUE>0 [0x0]</VALUE>
                                <CHANGEABLE>No</CHANGEABLE>
                        </DPO_AND_FUA_SUPPORTED>
                        <LONG_LBA>
                                <KEY_NAME>LLBA</KEY_NAME>
                                <VALUE>1 [0x1]</VALUE>
                                <CHANGEABLE>No</CHANGEABLE>
                        </LONG_LBA>
                        <BLOCK_DESCRIPTOR_LENGTH>
                                <KEY_NAME>BDL</KEY_NAME>
                                <VALUE>16 [0x10]</VALUE>
                                <CHANGEABLE>No</CHANGEABLE>
                        </BLOCK_DESCRIPTOR_LENGTH>
                </HEADER>
                <PARAMETERS>
                        <NUMBER_OF_LOGICAL_BLOCKS>
                                <KEY_NAME>NLB</KEY_NAME>
                                <MAX_VALUE>NA</MAX_VALUE>
                                <VALUES>
                                        <CURRENT_VALUE>1953525168
[0x74706db0]</CURRENT_VALUE>
                                        <DEFAULT_VALUE>0 [0x0]</DEFAULT_VALUE>
                                        <SAVED_VALUE>0 [0x0]</SAVED_VALUE>
                                        <CHANGEABLE>No</CHANGEABLE>
                                </VALUES>
                        </NUMBER_OF_LOGICAL_BLOCKS>
                        <LOGICAL_BLOCK_LENGTH>
                                <KEY_NAME>LBL</KEY_NAME>
                                <MAX_VALUE>NA</MAX_VALUE>
                                <VALUES>
                                        <CURRENT_VALUE>512 [0x200]</CURRENT_VALUE>
                                        <DEFAULT_VALUE>0 [0x0]</DEFAULT_VALUE>
                                        <SAVED_VALUE>0 [0x0]</SAVED_VALUE>
                                        <CHANGEABLE>No</CHANGEABLE>
                                </VALUES>
                        </LOGICAL_BLOCK_LENGTH>
                </PARAMETERS>
        </MODE_DATA>
</TSBDRV>
```

Example 4: Print mode descriptor value of SCSI device in JSon format

```
tsbdrv mode desc PHYSICALDRIVE15 -j
{
        “DrvCommonTool”:{
                "mode_data": {
                        "physical_drive" : "PHYSICALDRIVE15",
                        "page_name" : "SCSI Mode block descriptor",
                        "parameters": {
                                "number_of_logical_blocks": {
                                        "key_name" : "NLB",
                                        "max_value" : "NA",
                                        "values": {
                                                "current_value" : "1953525168
[0x74706db0]",
                                                "default_value" : "0 [0x0]",
                                                "saved_value" : "0 [0x0]",
                                                "changeable" : "No"
```



```
                                        }
                                },
                                "logical_block_length": {
                                        "key_name" : "LBL",
                                        "max_value" : "NA",
                                        "values": {
                                                "current_value" : "512 [0x200]",
                                                "default_value" : "0 [0x0]",
                                                "saved_value" : "0 [0x0]",
                                                "changeable" : "No"
                                        }
                                }
                        }
                }
        }
}
```


Example 5: Print mode descriptor value of SCSI device in hex format

```
tsbdrv mode desc PHYSICALDRIVE15 -hex

SCSI Mode block descriptor [Page: 0x00, SubPage: 0x0000] Hex-Dump
------------------------------------------------------------
00000000: 00 16 00 10 01 00 00 10 00 00 00 01 5d 50 a3 b0   '............]P..'
00000010: 00 00 00 00 00 00 02 00                           '........'
------------------------------------------------------------

Command return code: 0x00000000 [Command completed successfully]
```

5.12.3 Mode get

This command can be used to print mode parameter values.

The syntax for this command is as follows:

```
tsbdrv mode get <devid> <page> [-sp <value>] [-hdr] [-xml] [-j] [-hex] [-v]

By default the following optional parameters are specified: -sp 0
```

Below table describes the parameters and sample usage of '*mode get*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
page	Mode page in decimal format or hexadecimal (prefix with 0x) [Min: 0x0, Max: 0xFF]
Optional Parameter	
-sp, --subpage	Mode sub-page in decimal or hexadecimal (prefix with 0x) [Min: 0x0, Max: 0xFF]
-hdr, --header	Print mode data header along with mode data parameters
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output
-v, --verbose	Display verbose output

Note

1. Refer output of 'tsbdrv mode directory' command to get page address and range of sub-pages.
2. TSBDRV supports parsing of following mode pages

Page, Subpage	Description
0x01, 0x00	Read-Write Error Recovery mode page
0x02, 0x00	Disconnect-Reconnect mode page

0x07, 0x00	Verify Error Recovery mode page
0x08, 0x00	Caching mode page
0x0A, 0x00	Control mode page
0x1A, 0x00	Power Condition mode page
0x1C, 0x00	Informational Exceptions Control mode page

For the remaining mode pages, hex-dump of the page content will be printed.

3. When [-hex] option is used 8 byte mode data header is also printed with mode page data.

Example 1: Print mode parameter values of SCSI device.

```
tsbdrv mode get PHYSICALDRIVE15 0x01

::[PHYSICALDRIVE15]:Read-Write Error Recovery Mode Page::
                                                                                |
Values                   |
Parameter                                                    Key name    |Current
Default     Saved       Changeable| Max value
--------------------------------------------------------------------------------
------------------------------------------------
Parameter:Automatic write reassignment enabled               AWRE         1
1           1           Yes         1
Parameter:Automatic read reassignment enabled                ARRE         1
1           1           Yes         1
Parameter:Transfer block                                     TB           0
0           0           Yes         1
Parameter:Read continuous                                    RC           0
0           0           Yes         1
Parameter:Enable early recovery                              EER          1
0           1           Yes         1
Parameter:Post error                                         PER          0
0           0           Yes         1
Parameter:Data terminate on error                            DTE          0
0           0           Yes         1
Parameter:Disable correction                                 DCR          0
0           0           Yes         1
Parameter:Read retry count                                   RRC          255
255         255         Yes         255
Parameter:Logical block provisioning error reporting enabled LBPERE       0
0           0           No          NA
Parameter:Write retry count                                  WRC          255
255         255         Yes         255
Parameter: Recovery time limit                                  RTL          5000
8000        5000        Yes         65535

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Print mode parameter value along with data header of SCSI device.

```
tsbdrv mode get PHYSICALDRIVE15 0x01 -sp 0x00 –hdr

::[PHYSICALDRIVE15]:Read-Write Error Recovery Mode Page::
                                                                                |
Values                   |
Parameter                                                    Key name    |Current
Default     Saved       Changeable| Max value
--------------------------------------------------------------------------------
------------------------------------------------
Header:Mode Data Length                                      MODELEN      18
18          18          Yes         0
Header:Medium Type                                           MTYPE        0
0           0           No          NA
Header:Write Protected                                       W_PROT       0
0           0           No          NA
Header:DPO and FUA supported                                 DPO_FUA      0
0           0           No          NA
```



```
Header:Long LBA                                                 LLBA          0
0           0           No          NA
Header:Block Descriptor Length                                  BDL           0
0           0           No          NA
Parameter:Automatic write reassignment enabled                  AWRE          1
1           1           Yes         1
Parameter:Automatic read reassignment enabled                   ARRE          1
1           1           Yes         1
Parameter:Transfer block                                        TB            0
0           0           Yes         1
Parameter:Read continuous                                       RC            0
0           0           Yes         1
Parameter:Enable early recovery                                 EER           1
0           1           Yes         1
Parameter:Post error                                            PER           0
0           0           Yes         1
Parameter:Data terminate on error                               DTE           0
0           0           Yes         1
Parameter:Disable correction                                    DCR           0
0           0           Yes         1
Parameter:Read retry count                                      RRC           255
255         255         Yes         255
Parameter:Logical block provisioning error reporting enabled LBPERE       0
0           0           No          NA
Parameter:Write retry count                                     WRC           255
255         255         Yes         255
Parameter: Recovery time limit                                    RTL           5000
8000        5000        Yes         65535

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Print mode parameter values of SCSI device in XML format.

```
tsbdrv mode get PHYSICALDRIVE15 0x01 –xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <MODE_DATA>
                <PHYSICAL_DRIVE>PHYSICALDRIVE15</PHYSICAL_DRIVE>
                <PAGE_NAME>Read-Write Error Recovery Mode Page</PAGE_NAME>
                <PARAMETERS>
                        <AUTOMATIC_WRITE_REASSIGNMENT_ENABLED>
                                <KEY_NAME>AWRE</KEY_NAME>
                                <MAX_VALUE>1 [0x1]</MAX_VALUE>
                                <VALUES>
                                        <CURRENT_VALUE>1 [0x1]</CURRENT_VALUE>
                                        <DEFAULT_VALUE>1 [0x1]</DEFAULT_VALUE>
                                        <SAVED_VALUE>1 [0x1]</SAVED_VALUE>
                                        <CHANGEABLE>Yes</CHANGEABLE>
                                </VALUES>
                        </AUTOMATIC_WRITE_REASSIGNMENT_ENABLED>
                        . . .
                        . . .

                        < RECOVERY_TIME_LIMIT>
                                <KEY_NAME>RTL</KEY_NAME>
                                <MAX_VALUE>65535 [0xffff]</MAX_VALUE>
                                <VALUES>
                                        <CURRENT_VALUE>5000
[0x1388]</CURRENT_VALUE>
                                        <DEFAULT_VALUE>8000
[0x1f40]</DEFAULT_VALUE>
                                        <SAVED_VALUE>5000 [0x1388]</SAVED_VALUE>
                                        <CHANGEABLE>Yes</CHANGEABLE>
                                </VALUES>
                        </ RECOVERY_TIME_LIMIT>
                </PARAMETERS>
        </MODE_DATA>
</TSBDRV>
```


Example 4: Print mode parameter values of SCSI device in JSon format

```
tsbdrv mode get PHYSICALDRIVE15 0x01 –j

{
        “DrvCommonTool”:{
                "mode_data": {
                        "physical_drive" : "PHYSICALDRIVE15",
                        "page_name" : "Read-Write Error Recovery Mode Page",
                        "parameters": {
                                "automatic_write_reassignment_enabled": {
                                        "key_name" : "AWRE",
                                        "max_value" : "1 [0x1]",
                                        "values": {
                                                "current_value" : "1 [0x1]",
                                                "default_value" : "1 [0x1]",
                                                "saved_value" : "1 [0x1]",
                                                "changeable" : "Yes"
                                        }
                                },
                                . . .
                                . . .

                                " recovery_time_limit": {
                                        "key_name" : "RTL",
                                        "max_value" : "65535 [0xffff]",
                                        "values": {
                                                "current_value" : "5000 [0x1388]",
                                                "default_value" : "8000 [0x1f40]",
                                                "saved_value" : "5000 [0x1388]",
                                                "changeable" : "Yes"
                                        }
                                }
                        }
                }
        }
}
```

Example 5: Print mode parameter values of SCSI device in in hex format

```
tsbdrv mode get sda 0x01 -hex

Read-Write Error Recovery Mode Page (Current) [Page: 0x01, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------
00000000: 00 12 00 10 00 00 00 00 81 0a c0 ff ff 00 00 00   '................'
00000010: 3f 00 1f 40                                       '?..@'
-------------------------------------------------------
Read-Write Error Recovery Mode Page (Default) [Page: 0x01, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------
00000000: 00 12 00 10 00 00 00 00 81 0a c0 3f ff 00 00 00   '...........?....'
00000010: 3f 00 1f 40                                       '?..@'
-------------------------------------------------------
Read-Write Error Recovery Mode Page (Saved) [Page: 0x01, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------
00000000: 00 12 00 10 00 00 00 00 81 0a c0 ff ff 00 00 00   '................'
00000010: 3f 00 1f 40                                       '?..@'
-------------------------------------------------------
Read-Write Error Recovery Mode Page (Changeable) [Page: 0x01, SubPage: 0x0000] Hex-Dump
-------------------------------------------------------
00000000: 00 12 00 10 00 00 00 00 81 0a ff ff 00 00 00 00   '................'
00000010: ff 00 ff ff                                       '....'
-------------------------------------------------------

Command return code: 0x00000000 [Command completed successfully]
```

5.12.4 Mode set

This command is used to change the value of mode parameters.

The syntax for this command is as follows:

```
tsbdrv mode set <devid> <page> <params> [-sp <value>] [-v]

By default the following optional parameters are specified: -sp 0
```

Below table describes the parameters and sample usage of *'mode set'* command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
page	Mode page in decimal format or hexadecimal (prefix with 0x) [Min: 0x0, Max: 0xFF]
Params	Comma separated mode parameter values in format <KEY>=<VALUE> where <KEY> is the 'Key name' of parameter and <VALUE> is the value in decimal or hexadecimal format within given range from 0 to its Max as supported (e.g. KEY1=1,KEY2=0x100)
Optional Parameter	
-sp, --subpage	Mode sub-page in decimal or hexadecimal (prefix with 0x) [Min: 0x0, Max: 0xFF]
-v, --verbose	Display verbose output

Note

1. Refer output of 'tsbdrv mode directory' command to obtain page address and range of sub-pages.
2. For KEY=VALUE pair, KEY must be the 'Key name' of respective mode get command and VALUE must not exceed the maximum value.
3. The maximum value is only the guideline by tool. A device may support less than the maximum value specified. If a value, outside the supported range on device, is provided, then the device may either reject the 'mode set' command or set the value to its minimum/maximum/default value.
4. Refer **Note** in section 'Mode get' for the list of mode pages which are supported to configure via TSBDRV.
5. Value set using mode set will be also saved for the purpose of retaining the value after power cycle depending on the PS (parameter saveable bit) in each mode page.

Example 1: Set mode parameter values of SCSI device.

```
tsbdrv mode set PHYSICALDRIVE15 0x01 AWRE=0
Command return code: 0x00000000 [Command completed successfully]

tsbdrv mode get PHYSICALDRIVE15  0x01
::[PHYSICALDRIVE15]:Read-Write Error Recovery Mode Page::

|                     Values                    |
Parameter                                                                Key name
|Current     Default     Saved       Changeable| Max value
-------------------------------------------------------------------------------
-------------------------------------------------------------
Parameter:Automatic write reassignment enabled                           AWRE
0           1           0           Yes         1
Parameter:Automatic read reassignment enabled                            ARRE
1           1           1           Yes         1
Parameter:Transfer block                                                 TB
0           0           0           Yes         1
Parameter:Read continuous                                                RC
0           0           0           Yes         1
Parameter:Enable early recovery                                          EER
1           0           1           Yes         1
Parameter:Post error                                                     PER
0           0           0           Yes         1
Parameter:Data terminate on error                                        DTE
0           0           0           Yes         1
Parameter:Disable correction                                             DCR
0           0           0           Yes         1
```



```
Parameter:Read retry count                                                  RRC
255         255         255         Yes         255
Parameter:Logical block provisioning error reporting enabled                LBPERE
0           0           0           No          NA
Parameter:Write retry count                                                 WRC
255         255         255         Yes         255
Parameter: Recovery time limit                                                 RTL
5000        8000        5000        Yes         65535

Command return code: 0x00000000 [Command completed successfully]
```

5.12.5 Mode setfield

This command is used to change the value of mode parameters at a given offset.

The syntax for this command is as follows:

```
tsbdrv mode setfield <devid> <page> <offset> <mask> <value> [-sp <value>] [-v]
```

```
By default the following optional parameters are specified: -sp 0
```

Below table describes the parameters and sample usage of *'mode setfield'* command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
page	Mode page in decimal format or hexadecimal (prefix with 0x) [Min: 0x0, Max: 0xFF]
offset	Mode page byte offset in decimal format or hexadecimal (prefix with 0x)
mask	Mask in decimal format or hexadecimal (prefix with 0x)
value	Value to be set in decimal format or hexadecimal (prefix with 0x)
Optional Parameter	
-sp, --subpage	Mode sub-page in decimal or hexadecimal (prefix with 0x) [Min: 0x0, Max: 0xFF]
-v, --verbose	Display verbose output

Example 1: Set mode parameter values of SCSI device.

```
tsbdrv mode setfield sdb 0x1A 0x3 0x09  0x08

/dev/sdb: Mode parameter change command completed successfully.

Command return code: 0x00000000 [Command completed successfully]

tsbdrv mode get sdb 0x1A

::[/dev/sdb]:Power Condition Mode Page::

|                     Values                    |
Parameter                                                                   Key name
|Current     Default     Saved       Changeable| Max value
------------------------------------------------------------------------------
------------------------------------------------------
Parameter:Performing background precedence                                  PBP
1           1           1           Yes         3
Parameter:Standby_Y                                                         SY
0           0           0           No          NA
Parameter:Idle_C                                                            IC
1           0           0           Yes         1
Parameter:Idle_B                                                            IB
1           1           1           No          NA
```



```
Parameter:Idle_A                                                    IA
1           1           1           No          NA
Parameter:Standby_Z                                                 SZ
0           0           0           Yes         1
Parameter:Idle_A Condition Timer                                    IACT
20          20          20          No          NA
Parameter:Standby_Z Condition Timer                                 SZCT
4294967295  4294967295  4294967295  Yes         4294967295
Parameter:Idle_B Condition Timer                                    IBCT
6000        6000        6000        No          NA
Parameter:Idle_C Condition Timer                                    ICCT
9000        9000        9000        No          NA
Parameter:Standby_Y Condition Timer                                 SYCT
4294967295  4294967295  4294967295  No          NA
Parameter:CCF Idle                                                  CCFI
1           1           1           Yes         3
Parameter:CCF Standby                                               CCFS
2           2           2           Yes         3
Parameter:CCF Stopped                                               CCFT
2           2           2           Yes         3

Command return code: 0x00000000 [Command completed successfully]
```


5.13 Selftest

This command can be used for below purposes:

- To start the short or extended self-test on device.
- To abort the running self-test.
- To check the status of running self-test.
- To check the results of the self-test.

The syntax for this command and its subcommands is as follows:

```
tsbdrv selftest short <devid> [-f] [-s] [-p] [-xml] [-j] [-v]

tsbdrv selftest long <devid> [-f] [-s] [-p] [-xml] [-j] [-v]

tsbdrv selftest abort <devid> [-v]

tsbdrv selftest status <devid> [-xml] [-j] [-v]

tsbdrv selftest result <devid> [-a] [-xml] [-j] [-hex] [-v]
```

5.13.1 Selftest short

This command starts a new short/quick self-test on device.

The syntax for this command is as follows:

```
tsbdrv selftest short <devid> [-f] [-s] [-p] [-xml] [-j] [-v]
```

Below table describes the parameters and sample usage of 'selftest *short*' command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-f, --force	Force to execute the test even if other self-test is already running on device
-s, --silent	Silent/unattended mode
-p, --poll	Keep polling for the progress after starting self-test on device and prints the result at the end
-xml, --xml	Display final self-test result in XML output (ignored if --poll is not selected)
-j, --json	Display final self-test result in JSon output (ignored if --poll is not selected)
-v, --verbose	Display verbose output
Note 1. If any other instance of self-test is already running on device then a. If -s and -f options are not provided, then application will ask for user confirmation. b. If -s option is provided but -f option is not provided, then command will be aborted. c. If -f option is provided, then tool will not ask for any confirmation even if -s option is not provided. d. If either -s and -f option is provide or confirmed by user during execution, then the old self-test will be aborted and new short self-test will be started on device. 2. This is not recommended to execute '*selftest short*' command in parallel with any other command on same device.	
Example 1: Start new short test	


```
tsbdrv selftest short sda

/dev/sda: Execute Short Self-test command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Start new short test when a test is already running

```
tsbdrv selftest short sda

Warning: Another instance of self-test is already running/pending on device.
Running new self-test will abort the old self-test.
Do you want to continue? [Y/n] n

Command return code: 0x80004000
TSBERR64: Operation cancelled by user
```

Example 3: Start new short test with -f option when a test is already running

```
tsbdrv selftest short sda –f

Warning: Another instance of self-test is already running/pending on device.
Running new self-test will abort the old self-test.

/dev/sda: Short Self-test started successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Start new short test with polling

```
tsbdrv selftest short sda -p

/dev/sda: Short self-test started successfully.

[Self-test status: Not Running] [Remained: NA]

SELF-TEST RESULT on /dev/sda
ENTRY   Type                Status            Time-Stamp  Test duration Failed LBA
-------------------------------------------------------------------------------
--------
1       Offline Short       LBA Error         4536        10sec         NA

Command return code: 0x00000000 [Command completed successfully]
```

Example 5: Start new short test with polling in XML format

```
tsbdrv selftest short sda -p -xml

/dev/sda: Short self-test started successfully.

[Self-test status: Not Running] [Remained: NA]

SELF-TEST RESULT on /dev/sda
<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <DRIVE>
                <PHYSICAL_DRIVE>/dev/sda</PHYSICAL_DRIVE>
                <ENTRY>
                        <ENTRY_NO>1</ENTRY_NO>
                        <TEST_TYPE>Offline Short</TEST_TYPE>
                        <TEST_STATUS>LBA Error</TEST_STATUS>
                        <LIFE_TIMESTAMP_IN_HOURS>4536</LIFE_TIMESTAMP_IN_HOURS>
                        <FAILED_LBA>NA</FAILED_LBA>
                        <TEST_DURATION_IN_SECONDS>10
[0xa]</TEST_DURATION_IN_SECONDS>
                </ENTRY>
```



```
        </DRIVE>
</tsbdrv>
```

Example 6: Start new short test with polling in JSon format

```
tsbdrv selftest short sda -p -j

/dev/sda: Short self-test started successfully.

[Self-test status: Not Running] [Remained: NA]

SELF-TEST RESULT on /dev/sda
{
        "DrvCommonTool":{
                "drive": {
                        "physical_drive" : "/dev/sda",
                        "entry": {
                                "entry_no" : "1",
                                "test_type" : "Offline Short",
                                "test_status" : "LBA Error",
                                "life_timestamp_in_hours" : "4536",
                                "failed_lba" : "NA",
                                "test_duration_in_seconds" : "10 [0xa]"
                        }
                }
        }
}
```

5.13.2 Selftest long

This command starts a new long/extended self-test on device.

The syntax for this command is as follows:

```
tsbdrv selftest long <devid> [-f] [-s] [-p] [-xml] [-j] [-v]
```

Below table describes the parameters and sample usage of *'selftest long'* command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-f, --force	Force to execute the test even if other self-test is already running on device
-s, --silent	Silent/unattended mode
-p, --poll	Keep polling for the progress after starting self-test on device and prints the result at the end
-xml, --xml	Display final self-test result in XML output (ignored if --poll is not selected)
-j, --json	Display final self-test result in JSon output (ignored if --poll is not selected)
-v, --verbose	Display verbose output

Note

1. If any other instance of self-test is already running on device then
   a. If -s and -f options are not provided, then application will ask for user confirmation.
   b. If -s option is provided but -f option is not provided, then command will be aborted.
   c. If -f option is provided, then tool will not ask for any confirmation even if -s option is not provided.

d. If either -s and -f option is provide or confirmed by user during execution, then the old self-test will be aborted and new short self-test will be started on device.

2. This is not recommended to execute '*selftest long*' command in parallel with any other command on same device.

Example 1: Start new extended test

```
tsbdrv selftest long sda

/dev/sda: Extended Self-test started successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Start new short test when a test is already running

```
tsbdrv selftest long sda

Warning: Another instance of self-test is already running/pending on device.
Running new self-test will abort the old self-test.
Do you want to continue? [Y/n] n

Command return code: 0x80004000
TSBERR64: Operation cancelled by user
```

Example 3: Start new short test with -f option when a test is already running

```
tsbdrv selftest long sda –f

Warning: Another instance of self-test is already running/pending on device.
Running new self-test will abort the old self-test.

/dev/sda: Extended Self-test started successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 4: Start new extended test with polling

```
tsbdrv selftest long sda -p

/dev/sda: Extended self-test started successfully.

[Self-test status: Not Running] [Remained: NA]

SELF-TEST RESULT on /dev/sda
ENTRY   Type                Status            Time-Stamp  Test duration Failed LBA
-------------------------------------------------------------------------------
--------
1       Offline Extended    LBA Error         4537        300sec        NA

Command return code: 0x00000000 [Command completed successfully]
```

Example 5: Start new extended test with polling in XML format

```
tsbdrv selftest long sda -p -xml

/dev/sda: Extended self-test started successfully.

[Self-test status: Not Running] [Remained: NA]

SELF-TEST RESULT on /dev/sda
<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <DRIVE>
                <PHYSICAL_DRIVE>/dev/sda</PHYSICAL_DRIVE>
                <ENTRY>
                        <ENTRY_NO>1</ENTRY_NO>
                        <TEST_TYPE>Offline Extended</TEST_TYPE>
```



```
                        <TEST_STATUS>LBA Error</TEST_STATUS>
                        <LIFE_TIMESTAMP_IN_HOURS>4537</LIFE_TIMESTAMP_IN_HOURS>
                        <FAILED_LBA>NA</FAILED_LBA>
                        <TEST_DURATION_IN_SECONDS>300
[0x12c]</TEST_DURATION_IN_SECONDS>
                </ENTRY>
        </DRIVE>
</tsbdrv>
```

Example 6: Start new extended test with polling in JSon format

```
tsbdrv selftest long sda -p -j

/dev/sda: Extended self-test started successfully.

[Self-test status: Not Running] [Remained: NA]

SELF-TEST RESULT on /dev/sda
{
        "DrvCommonTool":{
                "drive": {
                        "physical_drive" : "/dev/sda",
                        "entry": {
                                "entry_no" : "1",
                                "test_type" : "Offline Extended",
                                "test_status" : "LBA Error",
                                "life_timestamp_in_hours" : "4537",
                                "failed_lba" : "NA",
                                "test_duration_in_seconds" : "300 [0x12c]"
                        }
                }
        }
}
```

5.13.3 Selftest abort

This command is used to abort the running self-test on device.

The syntax for this command is as follows:

```
tsbdrv selftest abort <devid> [-v]
```

Below table describes the parameters and sample usage of *'selftest abort'* command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-v, --verbose	Display verbose output

Note This is not recommended to execute '*selftest abort*' command in parallel with any other command on same device.

Example 1: Abort when test in running

```
tsbdrv selftest abort sda

/dev/sda: Self-test aborted successfully.

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Abort when test in not running

```
tsbdrv selftest abort sda

Command return code: 0x80007d00
```



```
TSBERR125: Self-test is not running on device
See log file 'C:\ProgramData\TOSHIBA\TSBDRV\TSBDRV-1496830713-3880.log' for
details.
```

5.13.4 Selftest status

This command is used to check the self-test completion status.

The syntax for this command is as follows:

```
tsbdrv selftest status <devid> [-xml] [-j] [-v]
```

Below table describes the parameters and sample usage of *'selftest status'* command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-xml, --xml	Display XML output
-j, --json	Display JSon output
-v, --verbose	Display verbose output

Example 1: Status when test in not running

```
tsbdrv selftest status sda

SELF-TEST STATUS

PHYSICALDRIVE     Self-test Status                Remained
-------------------------------------------------------------

/dev/sda          Not Running                     NA

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Status when test is running

```
tsbdrv selftest status sda

SELF-TEST STATUS

PHYSICALDRIVE     Self-test Status                Remained
-------------------------------------------------------------

/dev/sda          Active                          90%

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Status when test is running in XML

```
tsbdrv selftest status sda -xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <DRIVE>
                <ID>/dev/sda</ID>
                <SELF_TEST_STATUS>Active</SELF_TEST_STATUS>
                <REMAINED>80%</REMAINED>
        </DRIVE>
</tsbdrv>
```

Example 4: Status when test is not running in JSon format

```
tsbdrv selftest status sda -j
{
        "DrvCommonTool":{
```



```
                "drive": {
                        "physical_drive" : "/dev/sda",
                        "self_test_status" : "Not Running",
                        "remained" : "NA"
                }
        }
}
```

5.13.5 Selftest result

This command is used to display the result of last (or all available) self-test execution.

The syntax for this command is as follows:

```
tsbdrv selftest result <devid> [-a] [-xml] [-j] [-hex] [-v]
```

Below table describes the parameters and sample usage of *'selftest result'* command.

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-a, --all	Display all the available self-test results(By default only last self-test result will be displayed)
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex, --hex	Display Hex Dump output of full log page
-v, --verbose	Display verbose output

Note

While requesting to display all the available self-test results using -a option

1. On SCSI device, only last **20** results of self-test will be printed as SCSI devices keeps last **20** results of self-tests only.
2. On SATA device, only last **19** results of self-test will be printed from the current log page of address 0x07 (i.e. Extended Smart Self-test Log).

Example 1: Display result of most recent self-test

```
tsbdrv selftest result sdc

SELF-TEST RESULT on /dev/sdc
ENTRY   Type                Status            Time-Stamp  Failed LBA
-------------------------------------------------------------------------
1       Offline Short       Hardware Error    662         NA

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Display result of all available self-tests

```
tsbdrv selftest result sdc -a
SELF-TEST RESULT on /dev/sdc
ENTRY   Type                Status            Time-Stamp  Failed LBA
-------------------------------------------------------------------------
1       Offline Extended    LBA Error         17018       0x123

2       Offline Extended    Hardware Error    15243       NA

3       Offline Short       Aborted           4371        NA

4       Offline Short       Aborted           4371        NA

5       Offline Short       Aborted           4371        NA

6       Offline Short       Aborted           4371        NA
```



```
7       Offline Short       Aborted           4371        NA

8       Offline Extended    Aborted           4371        NA

9       Offline Short       Aborted           4371        NA

10      Offline Short       Aborted           4371        NA

11      Offline Short       Aborted           4371        NA

12      Offline Short       Aborted           4371        NA

13      Offline Short       Aborted           4392        NA

14      Offline Extended    Aborted           4392        NA

15      Offline Extended    Aborted           4371        NA

16      Offline Short       Aborted           4371        NA

17      Offline Short       Aborted           4371        NA

18      Offline Short       Aborted           4371        NA

19      Offline Short       Aborted           4371        NA

Command return code: 0x00000000 [Command completed successfully]
```

Example 3: Display result of self-tests in XML

```
tsbdrv selftest result sdb -xml

<?xml version="1.0" encoding="UTF-8"?>
<DrvCommonTool xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" enable="1">
        <DRIVE>
                <PHYSICAL_DRIVE>/dev/sdb</PHYSICAL_DRIVE>
                <ENTRY>
                        <ENTRY_NO>1</ENTRY_NO>
                        <TEST_TYPE>Offline Short</TEST_TYPE>
                        <TEST_STATUS>Completed</TEST_STATUS>
                        <TIME_STAMP>423</TIME_STAMP>
                        <FAILED_LBA>NA</FAILED_LBA>
                </ENTRY>
        </DRIVE>
</tsbdrv>
```

Example 4: Display result of self-tests in JSon format

```
tsbdrv selftest status sda –j

{
        “DrvCommonTool”:{
                "drive": {
                        "physical_drive" : "/dev/sda",
                        "self_test_status" : "Not Running",
                        "remained" : "NA"
                }
        }
}
```


5.14 Diagtest

The command is used to perform device diagnostics test via

- Start stop unit test
- Read IO operation
- Write IO operation
- LBA verification
- Error duplication test
- Custom test

The syntax for this command and its subcommands is as follows:

```
tsbdrv diagtest unittest <devid> [-c <value>] [-x] [-v] [-logdir <value>]

tsbdrv diagtest read <devid> <io_type> [-ver] [-p <value>] [-b <value>] [-l
<value>] [-c <value>] [-r <value>] [-s] [-x] [-v] [-logdir <value>]

tsbdrv diagtest write <devid> <io_type> [-ver] [-p <value>] [-b <value>] [-l
<value>] [-c <value>] [-r <value>] [-f] [-s] [-x] [-v] [-logdir <value>]

tsbdrv diagtest lbatest <devid> <io_type> [-b <value>] [-l <value>] [-c <value>]
[-r <value>]  [-s] [-x] [-v] [-logdir <value>]

tsbdrv diagtest errdup <devid> [-w] [-to <value>] [-x] [-v] [-logdir <value>]

tsbdrv diagtest quick <devid> [-od <value>] [-nx] [-th <value>] [-logdir
<value>] [-v]

tsbdrv diagtest standard <devid> [-od <value>] [-w] [-nx] [-l <value>] [-c
<value>] [-th <value>] [-logdir <value>] [-s] [-v]

tsbdrv diagtest extended <devid> [-od <value>] [-w] [-nx] [-l <value>] [-c
<value>] [-th <value>] [-logdir <value>] [-s] [-v]

tsbdrv diagtest ntf <devid> [-dst <value>] [-c <value>] [-r <value>] [-slc] [-
noattr] [-noerr] [-l <value>] [-logdir <value>] [-v]

tsbdrv diagtest custom <devid> [-x] [-v] [-logdir <value>]
```

Note

1. This is not recommended to execute any of the '*diagtest*' command(s) in parallel with other commands on same device.
2. All '*diagtest*' commands are not supported for any RAID configuration.

5.14.1 Diagtest unittest

This command is used to perform device diagnostic test via start stop unit test.

The syntax for this command is as follows:

```
tsbdrv diagtest unittest <devid> [-c <value>] [-x] [-v] [-logdir <value>]
By default the following optional parameters are specified: -c 1 -logdir ""
```

Below table describes the parameters and sample usage of *'diagtest unittest'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier

Optional Parameter	
-c, --cycle	Number of test cycles [Min:1, Max:100]
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output
-logdir, --logdir	Set output log directory

Note

1. This command executes following sequence of commands in one cycle.

For multiple test cycles, below set of commands is executed for given number of cycles.

Step	On SAS	On SATA
1	Start stop unit with start: 0, immediate: 0	Standby
2	Start stop unit with start: 1, immediate: 0	Idle
3	Start stop unit with start: 0, immediate: 1	Standby immediate
4	Start stop unit with start: 1, immediate: 1	Idle immediate

Example 1: Unit test with default cycle count i.e. 1

```
tsbdrv diagtest unittest sda

[Cycle:  1] [Action:  Stop] [Immediate:  No] Success
[Cycle:  1] [Action: Start] [Immediate:  No] Success
[Cycle:  1] [Action:  Stop] [Immediate: Yes] Success
[Cycle:  1] [Action: Start] [Immediate: Yes] Success

/dev/sda: Start stop unit test completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1469201494-12502.log' for details.
```

Example 2: Unit test with cycle count 4

```
tsbdrv diagtest unittest sdc -c 4

[Cycle:  1] [Action:  Stop] [Immediate:  No] Success
[Cycle:  1] [Action: Start] [Immediate:  No] Success
[Cycle:  1] [Action:  Stop] [Immediate: Yes] Success
[Cycle:  1] [Action: Start] [Immediate: Yes] Success
[Cycle:  2] [Action:  Stop] [Immediate:  No] Success
[Cycle:  2] [Action: Start] [Immediate:  No] Success
[Cycle:  2] [Action:  Stop] [Immediate: Yes] Success
[Cycle:  2] [Action: Start] [Immediate: Yes] Success
[Cycle:  3] [Action:  Stop] [Immediate:  No] Success
[Cycle:  3] [Action: Start] [Immediate:  No] Success
[Cycle:  3] [Action:  Stop] [Immediate: Yes] Success
[Cycle:  3] [Action: Start] [Immediate: Yes] Success
[Cycle:  4] [Action:  Stop] [Immediate:  No] Success
[Cycle:  4] [Action: Start] [Immediate:  No] Success
[Cycle:  4] [Action:  Stop] [Immediate: Yes] Success
[Cycle:  4] [Action: Start] [Immediate: Yes] Success

/dev/sdc: Start stop unit test completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1469200650-4673.log' for details.
```

Example 3: Unit test with 1 cycle along with –x option

```
tsbdrv diagtest unittest sdb –x

[Cycle:  1] [Action:  Stop] [Immediate:  No] Success
[Cycle:  1] [Action: Start] [Immediate:  No] Success
[Cycle:  1] [Action:  Stop] [Immediate: Yes] Success
[Cycle:  1] [Action: Start] [Immediate: Yes] Success
```



```
/dev/sdb: Start stop unit test completed successfully.

Command return code: 0x00000000 [Command completed successfully]See log file
'/var/log/toshiba/tsbdrv/tsbdrv-1469200514-4488.log' for details.
```

Example 4: Unittest with –logdir option

```
tsbdrv diagtest unittest sdc -c 1 -logdir /tmp

[Cycle:  1] [Action:  Stop] [Immediate:  No] Success
[Cycle:  1] [Action: Start] [Immediate:  No] Success
[Cycle:  1] [Action:  Stop] [Immediate: Yes] Success
[Cycle:  1] [Action: Start] [Immediate: Yes] Success

/dev/sdc: Start stop unit test completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/tmp/tsbdrv-1543258911-5475.log' for details.
```

5.14.2 Diagtest read

This command is used to perform device diagnostic test via read IO operation.

The syntax for this command is as follows:

```
tsbdrv diagtest read <devid> <io_type> [-ver] [-p <value>] [-b <value>] [-l
<value>] [-c <value>] [-r <value>] [-s] [-x] [-v] [-logdir <value>]
```

```
By default the following optional parameters are specified: -p ff -b 0 -l 0 -c 0
-r 15M -logdir ""
```

Below table describes the parameters and sample usage of *'diagtest read'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
io_type	IO type (seq: Sequential, rand: Random)
Optional Parameter	
-ver, --verify	Verify read data against given pattern (Applicable only for sequential IO, ignored for random IO)
-p, --pattern	IO Pattern as (00/ff/f0/0f/a5/5a). Ignored if verify flag is not set
-b, --blksz	IO block size in terms of sector count. [0 means max-transfer size on device] [Min: 0, Max: 2048]
-l, --lba	Starting LBA address (Prefix with 0x for hexadecimal format)
-c, --count	LBA range as in count or percentage. Suffix with % for specifying count in percentage. (0 means whole disk will be used from starting LBA)
-r, --dur	IO duration in case of Random IO [Max: 8760H]. Suffix with s/S for seconds, m/M for minutes, h/H for hours. Value without suffix will be treated in seconds. Argument will be ignored for sequential IO
-s, --silent	Silent/unattended mode
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output
-logdir, --logdir	Set output log directory

Example 1:**Verify read data sequential IO with 512 block size on SCSI or SATA device**

```
tsbdrv diagtest read sda seq -ver -p 00 -b 512 -l 10 -c 20

/dev/sda: Read IO Statistics::
---------------------------------------
Read command count            : 20
```



```
Read LBA count                : 20
Read command failure count    : 0
Read LBA failure count        : 0
--------------------------------------
/dev/sda: Read operation on all LBA(s) in given range completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/tsbdrv/tsbdrv-1569411632-12375.log' for details.
```

Example 2: Verify read data in sequential manner with 512 block size on SAS device

```
tsbdrv diagtest read sda seq -ver -p 0f -b 512 -l 10 -c 20

Warning: IO on block size (512 > 32) may be rejected by few operating systems.
Do you want to continue? [Y/n] y


/dev/sda: Read operation on all LBA(s) in given range completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/tsbdrv/tsbdrv-1465411538-30488.log' for details.
```

Example 3:Verify read data with 1% count along with –x option

```
tsbdrv diagtest read sda seq –ver –c 1% -x

/dev/sda: Read operation on all LBA(s) in given range completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1469201953-12642.log' for details.
```

Example 4: Diagtest read operation with –logdir option

```
tsbdrv diagtest read sdc seq  -c 1 -logdir /tmp

/dev/sdc: Read operation on all LBA(s) in given range completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/tmp/tsbdrv-1543259299-5489.log' for details.
```

5.14.3 Diagtest write

This command is used to perform device diagnostic test via write IO operation.

The syntax for this command is as follows:

```
tsbdrv diagtest write <devid> <io_type> [-ver] [-p <value>] [-b <value>] [-l
<value>] [-c <value>] [-r <value>] [-f] [-s] [-x] [-v] [-logdir <value>]
```

```
By default the following optional parameters are specified: -p ff -b 0 -l 0 -c 0
-r 15M -logdir ""
```

Below table describes the parameters and sample usage of *'diagtest write'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
io_type	IO type (seq: Sequential, rand: Random)
Optional Parameter	
-ver, --verify	Verify written data (Applicable only for sequential IO, ignored for random IO)

-p, --pattern	IO Pattern as (00/ff/f0/0f/a5/5a)
-b, --blksz	IO block size in terms of sector count (0 means max-transfer size on Device) [Min:0, Max: 2048]
-l, --lba	Starting LBA address (Prefix with 0x for hexadecimal format)
-c, --count	LBA range as in count or percentage. Suffix with % for specifying count in percentage. (0 means whole disk will be used from starting LBA)
-r, --dur	IO duration in case of Random IO [Max: 8760H]. Suffix with s/S for seconds, m/M for minutes, h/H for hours. Value without suffix will be treated in seconds. Argument will be ignored for sequential IO
-f, --force	Ignore data loss possibility and perform write operation
-s, --silent	Silent/unattended mode (without -f option, test will be aborted)
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output
-logdir, --logdir	Set output log directory

Note This command will return "Command Restricted" error when executed for SMR drive(s)

Example 1: Verify the data written on disk of block size 512 on SATA or SCSI device

```
tsbdrv diagtest write sda seq -b 512 -l 0 -c 10 -f -s

Warning: Write test will over-write the LBA in test range.
                 This may destroy data on the device
/dev/sda: Write IO Statistics::
---------------------------------------
Write command count           : 10
Write LBA count               : 10
Write command failure count   : 0
Write LBA failure count       : 0
Read command count            : 0
Read LBA count                : 0
Read command failure count    : 0
Read LBA failure count        : 0
---------------------------------------
/dev/sda: Write operation on all LBA(s) in given range completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/tsbdrv/tsbdrv-1465411412-22370.log' for details.
```

Example 2: Verify the data written on disk of block size 512 on SAS device

```
tsbdrv diagtest write sda seq -ver -p 0f -b 512 -l 10 -c 20

Warning: Write test will over-write the LBA in test range.
         This may destroy data on the device
Do you want to continue? [Y/n] y
Warning: IO on block size (512 > 32) may be rejected by few operating systems.
Do you want to continue? [Y/n] y

/dev/sda: Write operation on all LBA(s) in given range completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/tsbdrv/tsbdrv-1465411524-30484.log' for details.
```

Example 3: Write sequential data on disk of 1024 block size with –x option

```
tsbdrv diagtest write 5 seq -p 00 -b 1024 -c 1% -x

Warning: Write test will over-write the LBA in test range.
         This may destroy data on the device
Do you want to continue? [Y/n] Y
Warning: IO on block size (1024 > 512) may be rejected by few operating systems.
Do you want to continue? [Y/n] Y
```



```
PHYSICALDRIVE5: Write operation on all LBA(s) in given range completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file 'C:\ProgramData\TOSHIBA\TSBDRV\TSBDRV-1469183030-892.log' for details.
```

Example 4: Diagtest write operation with –logdir option

```
tsbdrv diagtest write sdc seq  -c 10 -logdir /tmp -s –f

Warning: Write test will over-write the LBA(s) in test range.
         This may destroy data on the device.

WARNING: OPERATION 'Write' MAY CAUSE DATA LOSS on '/dev/sdc'.
Application will wait for '10 seconds' before starting 'Write' on device.
User can cancel the operation in this time frame either by pressing 'CTRL + C' or by
sending TERM signal to process.
..........
Continuing the operation...


/dev/sdc: Write operation on all LBA(s) in given range completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/tmp/tsbdrv-1543259669-5509.log' for details.
```

5.14.4 Diagtest lbatest

This command is used to perform device diagnostic test via LBA verification.

The syntax for this command is as follows:

```
tsbdrv diagtest lbatest <devid> <io_type> [-b <value>] [-l <value>] [-c <value>]
[-r <value>] [-s] [-x] [-v] [-logdir <value>]
```

```
By default the following optional parameters are specified: -b 0 -l 0 -c 0 –r
15M -logdir ""
```

Below table describes the parameters and sample usage of *'diagtest lbatest'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
io_type	IO type (seq: Sequential, rand: Random)
Optional Parameter	
-b, --blksz	IO block size in terms of sector count (0 means max-transfer size on device) [Min:0, Max:2048]
-l, --lba	Starting LBA address (Prefix with 0x for hexadecimal format)
-c, --count	LBA range as in count or percentage. Suffix with % for specifying count in percentage. (0 means whole disk will be used from starting LBA)
-r, --dur	IO duration in case of Random IO[Max: 8760H]. Suffix with s/S for seconds, m/M for minutes, h/H for hours. Value without suffix will be treated in seconds. Argument will be ignored for sequential IO
-s, --silent	Silent/unattended mode
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output
-logdir, --logdir	Set output log directory

Example 1: LBA verification on block of 512 bytes by doing sequential IO
 	
`tsbdrv diagtest lbatest sda seq –b 512 -l 0 -c 10`
 	
`/dev/sda: LBA test IO Statistics::`	


```
---------------------------------------
LBA test command count        : 10
LBA test LBA count            : 10
LBA test command failure count: 0
LBA test LBA failure count    : 0
---------------------------------------
/dev/sda: LBA test operation on all LBA(s) in given range completed successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/tsbdrv/tsbdrv-1465411624-30284.log' for details.
```

Example 2: LBA verification on block of 512 bytes by doing random IO

```
tsbdrv diagtest lbatest sda rand -b 512 -l 0 -c 10 -r 20s

/dev/sda: LBA test IO Statistics::
---------------------------------------
LBA test command count        : 3806
LBA test LBA count            : 3806
LBA test command failure count: 0
LBA test LBA failure count    : 0
---------------------------------------
/dev/sda: LBA test operation on all LBA(s) in given range completed
successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/tsbdrv/tsbdrv-1465411788-30494.log' for details.
```

Example 3: LBA verification on block of 512 bytes by doing sequential IO with –x option

```
tsbdrv diagtest lbatest 5 seq -b 512 -l 0 -c 10 -x

PHYSICALDRIVE5: LBA test operation on all LBA(s) in given range completed
successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file 'C:\ProgramData\TOSHIBA\TSBDRV\TSBDRV-1469183731-184.log' for
details.
```

Example 4: LBA verification test on device with –logdir option

```
tsbdrv diagtest lbatest sdc seq  -c 10 -logdir /tmp -s

/dev/sdc: LBA verification operation on all LBA(s) in given range completed
successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/tmp/tsbdrv-1543259794-5516.log' for details.
```

5.14.5 Diagtest errdup

This command is used to perform device diagnostic error duplication test.

This test tries to duplicate the IO error occurred on device.

The syntax for this command is as follows:

```
tsbdrv diagtest errdup <devid> [-w] [-to <value>] [-x] [-v] [-logdir <value>]

By default the following optional parameters are specified: -to 300 -logdir ""
```

Below table describes the parameters and sample usage of *'diagtest errdup'* command

Argument	Description

Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-w, --rewrite	Perform write and verify on defective LBA
-to, --timeout	Timeout for command in seconds (0 implies 'NO TIMEOUT', Default is 300) [Min: 0, Max: 4294967295]
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output
-logdir, --logdir	Set output log directory

Note

1. When re-write test (–w option) is not passed with command then the test will exit as soon as it encounters 1st LBA verification error.
2. If device capacity is reduced, then LBA for few error entries may be more than new capacity. Field "`Invalid LBA count (out of range)`" represents, the count of such LBA(s).
3. This command will return “Command Restricted” error if ‘-w’ parameter is enabled and executed for zbc drive(s).
4. If timeout happens during error lba collection, then the test will not terminate immediately from lba collection. However next step "LBA verification" will not be executed.

Example 1: Diagnostic error duplication test on device when no LBA errors are present on device.

```
tsbdrv diagtest errdup sdc

Error LBA collection completed

/dev/sdc: No defective LBA(s) found on device.
Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1469539944-2176.log' for details.
```

Example 2: Diagnostic error duplication test on device where LBA errors are present on device.

```
tsbdrv diagtest errdup sdc –w

Error LBA collection completed
LBA verification completed
Defective LBA count:                    114
Invalid LBA count (out of range):       99
Read verification success count:        15
Read verification failure count:        0
Write recovery test not performed.

/dev/sdc: Error duplication test on all defective LBA(s) completed
successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1517290677-5928.log' for details.
```

Example 3: Diagnostic error duplication test on device with –logdir option

```
tsbdrv diagtest errdup sdc -logdir /tmp

Error LBA collection completed
LBA verification completed
Defective LBA count:                    2
Invalid LBA count (out of range):       0
Read verification success count:        2
Read verification failure count:        0
Write recovery test not performed.
```



```
/dev/sdc: Error duplication test on all defective LBA(s) completed
successfully.

Command return code: 0x00000000 [Command completed successfully]

See log file '/tmp/tsbdrv-1543259962-5519.log' for details.
```

Example 4: Diagnostic error duplication test on SMR drive device with -w option

```
tsbdrv diagtest errdup sdq –w

Command return code: 0x8000c800
TSBERR200: Command restricted on device
See log file '/var/log/toshiba/tsbdrv/tsbdrv-1593430698-207796.log' for
details.
```

Example 5: Diagnostic error duplication test on device terminated due to timeout

```
tsbdrv diagtest errdup sdb --timeout 20

Error LBA collection completed
LBA verification terminated due to Timeout
Error in performing Error Duplication Test.
Command return code: 0x8000cb00
TSBERR203: Command execution timed out

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1627586771-18936.log' for details.
```

5.14.6 Diagtest quick

This command is used to perform device diagnostic quick test which covers following tests on device.

- Collect Inquiry/Identify Data from device,
- Collect SMART attribute information,
- Collect SMART errors,
- Check SMART Trip failure,
- Collect all supported internal logs on device,
- Collect error data and perform threshold checks,
- Perform error duplication test.

For error duplication test DST (self test) Error LBA is also checked.

The syntax for this command is as follows:

```
tsbdrv diagtest quick <devid> [-od <value>] [-nx] [-th <value>] [-logdir
<value>] [-v]

By default the following optional parameters are specified: -od "" -th "" -
logdir ""
```

Below table describes the parameters and sample usage of *'diagtest quick'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-od, --out_dir	Output directory (By default output file(s) will be created in current working directory)
-nx, --no_exclusive	Do not run with exclusive lock operation on device (By

	default command runs with exclusive lock)
-th, --threshold	Error threshold check <KEY=VALUE> pair (Supported thresholds keys are GDC:GLIST Count, UCN:Uncorrectable Count, CN:Correctable Count, PC:Pending Sector Count, RC:Reassign Sector Count)
-v, --verbose	Display verbose output
-logdir, --logdir	Set output log directory

Example 1: Device diagnostic quick test on device.

```
tsbdrv diagtest quick sda

                            Quick Diagnostic Tests
################################################################################

Identify data collection                - Started
Identify data collection                - Passed

Smart data collection                   - Started
Smart data collection                   - Passed

Smart error collection                  - Started
Smart error collection                  - Passed

Smart-trip check                        - Started
Smart-trip check                        - Passed

Internal log collection                 - Started
Internal log collection                 - Passed

Device error check                      - Started
Device error check                      - Passed

Error-duplication test                  - Started
    Error LBA collection in progress!
    Error LBA collection done!
Error-duplication test                  - Passed
################################################################################

Tests Summary
------------------------------------------------
Identify data collection                : PASS
Smart data collection                   : PASS
Smart error collection                  : PASS
Smart-trip check                        : PASS
Internal log collection                 : PASS
Device error check                      : PASS
Error-duplication test                  : PASS
------------------------------------------------

                  ************
                  *   PASS   *
                  ************

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1531830138-12583.log' for details.
```

Example 2: Device diagnostic quick test on device with -logdir option.

```
tsbdrv diagtest quick sdb -logdir /tmp/

                            Quick Diagnostic Tests
################################################################################
Identify data collection                - Started
Identify data collection                - Passed

Smart data collection                   - Started
```



```
Smart data collection                    - Passed

Smart error collection                   - Started
Smart error collection                   - Passed

Smart-trip check                         - Started
Smart-trip check                         - Passed

Internal log collection                  - Started
Internal log collection                  - Passed

Device error check                       - Started
Device error check                       - Passed

Error-duplication test                   - Started
    Error LBA collection in progress!
    Error LBA collection done!
    LBA verification in progress!
    LBA verification done!
Error-duplication test                   - Passed
################################################################################

Command return code: 0x00000000 [Command completed successfully]

See log file '/tmp/tsbdrv-1543312004-9445.log' for details.
```

5.14.7 Diagtest standard

This command is used to perform device diagnostic standard test which covers following tests on device.

- Collect Inquiry/Identify Data from device,
- Collect SMART attribute information,
- Collect SMART errors,
- Check SMART Trip failure,
- Collect all supported internal logs on device,
- Collect error data and perform threshold checks,
- Perform error duplication test,
- Perform random read based on cycle,
- Perform random write based on cycle,
- Perform random seek test based on cycle.

For error duplication test DST (self test) Error LBA is also checked.

The syntax for this command is as follows:

```
tsbdrv diagtest standard <devid> [-od <value>] [-w] [-nx] [-l <value>] [-c
<value>] [-th <value>] [-logdir <value>] [-s] [-v]
```

```
By default the following optional parameters are specified: -od "" -l 0 -c 0 -
th "" -logdir ""
```

Below table describes the parameters and sample usage of *'diagtest standard'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-od, --out_dir	Output directory (By default output file(s) will be created in current working directory)
-w, --write_permit	Allow write test to executed (if not provided then all write

	test(s) will be skipped)
-nx, --no_exclusive	Do not run with exclusive lock operation on device (By default command runs with exclusive lock)
-l, --lba	Starting LBA address (Prefix with 0x for hexadecimal format)
-c, --count	LBA range as in count or percentage. Suffix with % for specifying count in percentage (0 means whole disk will be used from starting LBA)
-th, --threshold	Error threshold check <KEY=VALUE> pair (Supported thresholds keys are GDC:GLIST Count, UCN:Uncorrectable Count, CN:Correctable Count, PC:Pending Sector Count, RC:Reassign Sector Count)
-s, --silent	Silent/unattended mode
-v, --verbose	Display verbose output
-logdir, --logdir	Set output log directory

Note This command will skip any write operations for SMR drive(s)

Example 1: Device diagnostic standard test on device.

```
tsbdrv diagtest standard sda -l 0 -c 50 -w  -s -od /root/temp

Warning: Write test will over-write the LBA(s) in test range.
         This may destroy data on the device.

WARNING: OPERATION 'Write' MAY CAUSE DATA LOSS on '/dev/sda'.
Application will wait for '10 seconds' before starting 'Write' on device.
User can cancel the operation in this time frame either by pressing 'CTRL + C'
or by sending TERM signal to process.
..........
Continuing the operation...

                            Standard Diagnostic Tests
################################################################################

Identify data collection                - Started
Identify data collection                - Passed

Smart data collection                   - Started
Smart data collection                   - Passed

Smart error collection                  - Started
Smart error collection                  - Passed

Smart-trip check                        - Started
Smart-trip check                        - Passed

Internal log collection                 - Started
Internal log collection                 - Passed

Device error check                      - Started
Device error check                      - Passed

Error-duplication test                  - Started
    Error LBA collection in progress!
    Error LBA collection done!
Error-duplication test                  - Passed

Random read test                        - Started
Random read test                        - Passed

Random write test                       - Started
Random write test                       - Passed

Random seek test                        - Started
Random seek test                        - Passed
################################################################################
```



```
Tests Summary
-------------------------------------------------
Identify data collection                : PASS
Smart data collection                   : PASS
Smart error collection                  : PASS
Smart-trip check                        : PASS
Internal log collection                 : PASS
Device error check                      : PASS
Error-duplication test                  : PASS
Random read test                        : PASS
Random write test                       : PASS
Random seek test                        : PASS
-------------------------------------------------

                  ************
                  *   PASS   *
                  ************

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1531830677-12646.log' for details.
```

Example 2: Device diagnostic standard test on device with –logdir option.

```
tsbdrv diagtest standard sdb -logdir /tmp/

                            Standard Diagnostic Tests
################################################################################
Identify data collection                - Started
Identify data collection                - Passed

Smart data collection                   - Started
Smart data collection                   - Passed

Smart error collection                  - Started
Smart error collection                  - Passed

Smart-trip check                        - Started
Smart-trip check                        - Passed

Internal log collection                 - Started
Internal log collection                 - Passed

Device error check                      - Started
Device error check                      - Passed

Error-duplication test                  - Started
    Error LBA collection in progress!
    Error LBA collection done!
    LBA verification in progress!
    LBA verification done!
Error-duplication test                  - Passed

Random read test                        - Started
Random read test                        - Passed

Random write test                       - Started
Random write test                       - Skipped ('write' test is not
selected)

Random seek test                        - Started
Random seek test                        - Passed
################################################################################

Command return code: 0x00000000 [Command completed successfully]

See log file '/tmp/tsbdrv-1543312872-10152.log' for details.
```

Example 3: Device diagnostic standard test on SMR drive.


```
 tsbdrv diagtest standard sdq -l 0 -c 50 -w -s -od /root/temp

Warning: Write test will over-write the LBA(s) in test range.
This may destroy data on the device.
WARNING: OPERATION 'Write' MAY CAUSE DATA LOSS on '/dev/sda'.
Application will wait for '10 seconds' before starting 'Write' on device.
User can cancel the operation in this time frame either by pressing 'CTRL + C'
or by sending TERM signal to process.
..........
Continuing the operation...

Standard Diagnostic Tests
################################################################################
Identify data collection - Started
Identify data collection - Passed

Smart data collection - Started
Smart data collection - Passed

Smart error collection - Started
Smart error collection - Passed

Smart-trip check - Started
Smart-trip check - Passed

Internal log collection - Started
Internal log collection - Passed

Device error check - Started
Device error check - Passed

Error-duplication test - Started
Error LBA collection in progress!
Error LBA collection done!
Error-duplication test - Passed

Random read test - Started
Random read test - Passed

Random write test - Started
Random write test - Skipped (Command restricted on SMR drives)

Random seek test - Started
Random seek test - Passed
################################################################################

Tests Summary
-------------------------------------------------
Identify data collection : PASS
Smart data collection : PASS
Smart error collection : PASS
Smart-trip check : PASS
Internal log collection : PASS
Device error check : PASS
Error-duplication test : PASS
Random read test : PASS
Random write test : SKIP
Random seek test : PASS
-------------------------------------------------
************
* PASS *
************
Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1531830677-12646.log' for details.
```


5.14.8 Diagtest extended

This command is used to perform device diagnostic extended test which covers following tests on device.

- Collect Inquiry/Identify Data from device,
- Collect SMART attribute information,
- Collect SMART errors,
- Check SMART Trip failure,
- Collect all supported internal logs on device,
- Collect error data and perform threshold checks,
- Perform error duplication test,
- Perform random read based on cycle,
- Perform random write based on cycle,
- Perform random seek test based on cycle,
- Perform unit start/stop test for 5 cycles,
- Perform sequential read starting from given LBA & given count,
- Perform sequential write (100MB boundary).

For error duplication test DST (self test) Error LBA is also checked.

The syntax for this command is as follows:

```
tsbdrv diagtest extended <devid> [-od <value>] [-w] [-nx] [-l <value>] [-c <value>] [-th <value>] [-logdir <value>] [-s] [-v]
```

```
By default the following optional parameters are specified: -od "" -l 0 -c 0 -th "" -logdir ""
```

Below table describes the parameters and sample usage of *'diagtest* extended*'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-od, --out_dir	Output directory (By default output file(s) will be created in current working directory)
-w, --write_permit	Allow write test to executed (if not provided then all write test(s) will be skipped)
-nx, --no_exclusive	Do not run with exclusive lock operation on device (By default command runs with exclusive lock)
-l, --lba	Starting LBA address (Prefix with 0x for hexadecimal format)
-c, --count	LBA range as in count or percentage. Suffix with % for specifying count in percentage (0 means whole disk will be used from starting LBA)
-th, --threshold	Error threshold check <KEY=VALUE> pair (Supported thresholds keys are GDC:GLIST Count, UCN:Uncorrectable Count, CN:Correctable Count, PC:Pending Sector Count, RC:Reassign Sector Count)
-s, --silent	Silent/unattended mode
-v, --verbose	Display verbose output
-logdir, --logdir	Set output log directory
Note This command will skip any write operations for SMR drive(s)	
Example 1: Perform device diagnostic extendeded test with write operation on selected LBAs on device. `tsbdrv diagtest extended sda -l 0 -c 50 -w  -s -od /root/temp`	


```
Warning: Write test will over-write the LBA(s) in test range.
         This may destroy data on the device.

WARNING: OPERATION 'Write' MAY CAUSE DATA LOSS on '/dev/sda'.
Application will wait for '10 seconds' before starting 'Write' on device.
User can cancel the operation in this time frame either by pressing 'CTRL + C'
or by sending TERM signal to process.
..........
Continuing the operation...

                            Extended Diagnostic Tests
################################################################################

Identify data collection                - Started
Identify data collection                - Passed

Smart data collection                   - Started
Smart data collection                   - Passed

Smart error collection                  - Started
Smart error collection                  - Passed

Smart-trip check                        - Started
Smart-trip check                        - Passed

Internal log collection                 - Started
Internal log collection                 - Passed

Device error check                      - Started
Device error check                      - Passed

Error-duplication test                  - Started
    Error LBA collection in progress!
    Error LBA collection done!
Error-duplication test                  - Passed

Start-stop unit test                    - Started
    [Cycle:  1] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  1] [Action: Start] [Immediate:  No] Success
    [Cycle:  1] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  1] [Action: Start] [Immediate: Yes] Success
    [Cycle:  2] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  2] [Action: Start] [Immediate:  No] Success
    [Cycle:  2] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  2] [Action: Start] [Immediate: Yes] Success
    [Cycle:  3] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  3] [Action: Start] [Immediate:  No] Success
    [Cycle:  3] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  3] [Action: Start] [Immediate: Yes] Success
    [Cycle:  4] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  4] [Action: Start] [Immediate:  No] Success
    [Cycle:  4] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  4] [Action: Start] [Immediate: Yes] Success
    [Cycle:  5] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  5] [Action: Start] [Immediate:  No] Success
    [Cycle:  5] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  5] [Action: Start] [Immediate: Yes] Success
Start-stop unit test                    - Passed

Sequential read test                    - Started
Sequential read test                    - Passed

Random read test                        - Started
Random read test                        - Passed

Random write test                       - Started
Random write test                       - Passed
```



```
Random seek test                          - Started
Random seek test                          - Passed

Boundary write test                       - Started
Boundary write test                       - Passed
################################################################################

Tests Summary
-------------------------------------------------
Identify data collection                  : PASS
Smart data collection                     : PASS
Smart error collection                    : PASS
Smart-trip check                          : PASS
Internal log collection                   : PASS
Device error check                        : PASS
Error-duplication test                    : PASS
Start-stop unit test                      : PASS
Sequential read test                      : PASS
Random read test                          : PASS
Random write test                         : PASS
Random seek test                          : PASS
Boundary write test                       : PASS
-------------------------------------------------

                   ************
                   *   PASS   *
                   ************

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1531830959-12654.log' for details.
```

Example 2: Perform device diagnostic extended test with –logdir option

```
tsbdrv diagtest extended sde -logdir /tmp/ -w -c 2

Warning: Write test will over-write the LBA(s) in test range.
         This may destroy data on the device.
Do you want to continue? [Y/n] y

WARNING: OPERATION 'Write' MAY CAUSE DATA LOSS on '/dev/sde'.
Application will wait for '10 seconds' before starting 'Write' on device.
User can cancel the operation in this time frame either by pressing 'CTRL + C'
or by sending TERM signal to process.
..........
Continuing the operation...

                            Extended Diagnostic Tests
################################################################################

Identify data collection                  - Started
Identify data collection                  - Passed

Smart data collection                     - Started
Smart data collection                     - Passed

Smart error collection                    - Started
Smart error collection                    - Passed

Smart-trip check                          - Started
Smart-trip check                          - Passed

Internal log collection                   - Started
Internal log collection                   - Passed

Device error check                        - Started
Device error check                        - Passed
```



```
Error-duplication test                    - Started
    Error LBA collection in progress!
    Error LBA collection done!
Error-duplication test                    - Passed

Start-stop unit test                      - Started
    [Cycle:  1] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  1] [Action: Start] [Immediate:  No] Success
    [Cycle:  1] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  1] [Action: Start] [Immediate: Yes] Success
    [Cycle:  2] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  2] [Action: Start] [Immediate:  No] Success
    [Cycle:  2] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  2] [Action: Start] [Immediate: Yes] Success
    [Cycle:  3] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  3] [Action: Start] [Immediate:  No] Success
    [Cycle:  3] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  3] [Action: Start] [Immediate: Yes] Success
    [Cycle:  4] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  4] [Action: Start] [Immediate:  No] Success
    [Cycle:  4] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  4] [Action: Start] [Immediate: Yes] Success
    [Cycle:  5] [Action:  Stop] [Immediate:  No] Success
    [Cycle:  5] [Action: Start] [Immediate:  No] Success
    [Cycle:  5] [Action:  Stop] [Immediate: Yes] Success
    [Cycle:  5] [Action: Start] [Immediate: Yes] Success
Start-stop unit test                      - Passed

Sequential read test                      - Started
Sequential read test                      - Passed

Random read test                          - Started
Random read test                          - Passed

Random write test                         - Started
Random write test                         - Passed

Random seek test                          - Started
Random seek test                          - Passed

Boundary write test                       - Started
Boundary write test                       - Passed
################################################################################

Command return code: 0x00000000 [Command completed successfully]

See log file '/tmp/tsbdrv-1543312925-10361.log' for details.
```

5.14.9 Diagtest ntf

This command is used to perform No Trouble Found (NTF) testing on the device. It contains the following subtests.

- Perform Quick/Long Device Self-Test
- Perform SMART Self Test Log Check
- Collect SMART Attribute information
- Collect SMART Errors
- Perform Sequential Read operations
- Perform Random Read operations

The syntax for this command is as follows:

```
tsbdrv diagtest ntf <devid> [-dst <value>] [-c <value>] [-r <value>] [-slc] [-
noattr] [-noerr] [-l <value>] [-logdir <value>] [-v]
```



```
By default the following optional parameters are specified: -dst 1 -c 25 -r 10 -l 0
-logdir ""
```

Below table describes the parameters and sample usage of *'diagtest* ntf' command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-dst, --self_test	Self Test Type (0:none , 1:short, 2:long) [Min: 0, Max: 2]
-c, --count	LBA range in percentage. If '0' then sequential read will not run. (default is 25%) [Min: 0, Max: 100]
-r --dur	Random read duration in minutes. If '0' then random read will not run. (default is 10) [Min: 0, Max: 30]
-slc, --log_check	Run Self test log check, (If not provided then log check will be skipped)
-noattr, --noattr	Skip SMART attribute check
-noerr, --noerr	Skip SMART error log check
-l, --lba	Starting LBA address (Prefix with 0x for hexadecimal format)
-logdir, --logdir	Set output log directory
-v, --verbose	Display verbose output

Example 1: Perform NTF diagnostic test on device and save logs in "/tmp" directory using -logdir option.

```
tsbdrv diagtest ntf sdc -c 1 -slc -l 0 -logdir /tmp

                                NTF Diagnostic Tests
################################################################################

Self Test                                   - Started
Self Test                                   - Passed

Self Test Log Check                         - Started
Self Test Log Check                         - Passed

Smart data collection                       - Started
Smart data collection                       - Passed

Smart error collection                      - Started
Smart error collection                      - Passed

Sequential read test                        - Started
Sequential read test                        - Passed

Random read test                            - Started
Random read test                            - Passed
################################################################################

Command return code: 0x00000000 [Command completed successfully]

See log file '/tmp/tsbdrv-1543327540-14412.log' for details.
```

5.14.10 Diagtest custom

This command is used to perform a custom test sequence on the device which will produce a 64-bit output result. It contains the following subtests.

- Perform SMART Data Collection
- Perform SMART Error Collection
- Perform Internal Log Collection

- Perform Device Error Check
- Perform SMART Trip Check
- Perform Error Duplication Test
- Perform DST Short Test

The syntax for this command is as follows:

```
tsbdrv diagtest custom <devid> [-x] [-v] [-logdir <value>]
```

By default the following optional parameters are specified: `-logdir ""`

64 bit Output Result in case of error is:

```
SMART Data Collection fail:       0x0000000000002001
SMART Error Collection fail:      0x0000000000002002
Internal Log Collection fail:     0x0000000000002008
Device Error Check fail:          0x0000000000002010
```

Below table describes the parameters and sample usage of *'diagtest* custom*'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output
-logdir, --logdir	Set output log directory

Note

3. Timeout occurs if execution time is more than 3 minutes.
4. This command is supported only on the following drive models: SATA MG04ACA, MG05ACA, MG06ACA, MG07ACA.
5. Error Duplication Test and DST Short Test are mutually exclusive. Only one test is executed between Error Duplication Test and DST Short Test.

Example 1: Perform custom diagnostic test on device and produce the output result

```
tsbdrv diagtest custom sdb

Custom test started...
LBA verification terminated due to Timeout
Error in performing Error Duplication Test.

Device Error test Percentage: 100
Smart Info test Percentage: 100
Error Dup test Percentage: 25
Device Error test Percentage: 100
Custom test completed...

Test Result: Head Failure

Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1629346474-5350.log' for details.
```

Example 2: Perform custom diagnostic test on device with –logdir option

```
tsbdrv diagtest custom sda -logdir /home/

Custom test started...
Error LBA collection completed
LBA verification terminated due to Timeout
Error in performing Error Duplication Test.
```



```
Device Error test Percentage: 100
Smart Info test Percentage: 100
Error Dup test Percentage: 25
Device Error test Percentage: 100
Custom test completed...

Test Result: Head Failure

Command return code: 0x00000000 [Command completed successfully]

See log file '/home/tsbdrv-1629346973-12974.log' for details.
```


5.15 OSNTF

The command is used to perform On-Site No Trouble Found Tests. This command provides following sub-tests:

Figure 5-2 OSNTF Tests

No.	Short NTFS	Full NTFS	Full NTFS W/Zero	Optional	Test item
1	☑				tsbdrv osntf short
2		☑			tsbdrv osntf full
3			☑		tsbdrv osntf fullz
4				☑	Drive model name present in the FW table?
5	☑	☑	☑		Identify/Inquiry
6	☑	☑	☑		SMART Data check
7	☑	☑	☑		G-List Check
8	☑	☑	☑		SMART Status Check
9				☑	Out put SMART Error Log/Sense Log Check
10	☑	☑	☑		Error duplication Check
11		☑	☑		SMART DST short
12		☑	☑		All surface verify
13				☑	RND Read (5 min)
14				☑	Linear R/W (5,000 cycle with 256 sector)
15				☑	Buttefly seek test (500 cycle with 1 sector)
16				☑	RND R/W (5,000 cycle with 256 sector)
17				☑	RND W/R/Compare (5,000 cycle with random(max256 sector))
18		☑	☑		Post Glist Check
19		☑	☑		Post Smart Status Check
20			☑	☑	All surface write
21				☑	- Firmware update ("All surface write" must be enabled)
22				☑	- write all zero => Sanitize ("All surface write" must be enabled)
23				☑	- pseudo-random 10% read scan with 00 Data compare ("All surface write" must be enabled)
24				☑	- OBA test ("All surface write" must be enabled)
25			☑		RND R/Comapre (00 Data) (Ignored for DELL case)
26				☑	Out put detail results
27				☑	Smart Attr / Threshold Data
28				☑	Read Stream Error Log (22h)
29				☑	Write Stream Error Log (21h)
30				☑	Device Statistics (04h)
31				☑	Pending Defects Log (0Ch)
32				☑	HDA Temperature History Table

The syntax for this command and its subcommands is as follows:

```
tsbdrv osntf genfile <ntf_type> [-od <value>]
tsbdrv osntf <devid> <conf> [-od <value>]
```


5.15.1 OSNTF genfile

This command is used to generate configuration file for specific osntf test to be performed on drive. This configuration file is then used in “osntf run” command as input. This command provides three standard test file.

- Short OSNTF Test
- Full NTF Test
- Full NTF with zero write

The syntax for this command is as follows:
tsbdrv osntf genfile <ntf_type> [-od <value>]
By default, the following optional parameters are specified: -od ""

Please find detailed description of each parameter in config file listed below:

Sub-Tests	Parameters	Values/Range	Unit
identify	-	true/false	NA
smart_data_check	enabled	true/false	NA
	ltlimit	0-4294967295	Count
	mtlimit	0-255	Count
	edlimit	0-93075	Count
	pclimit	0-4294967295	Count
	lulclimit	0-4294967295	Count
g_list	enabled	true/false	NA
	glist	0-255	Count
smart_status_check	-	true/false	Count
sensecode	-	true/false	Count
error_dup_check	-	true/false	Count
dst_short	-	true/false	NA
all_surface_verify	-	true/false	NA
rnd_rd	enabled	true/false	NA
	time	0-300	Seconds
seq_rd_wr	enabled	true/false	NA
	cycle	0-5000	Number of Cycles
	start_lba	0	LBA Count
butterfly	enabled	true/false	NA
	cycle	0-5000	Number of Cycles
	start_lba	0	LBA Count
	end_lba	0	LBA Count
rand_rd_wr	enabled	true/false	NA
	cycle	0-5000	Number of Cycles
rand_rd_wr_cmp	enabled	true/false	NA
	cycle	0-5000	Number of Cycles
detail	-	true/false	NA
post_g_list	enabled	true/false	NA
	glist	0-255	Count
post_smart_status_check	-	true/false	NA
all_wr	-	true/false	NA
rnd_rd_cmp	enabled	true/false	NA
	time	0-300	Seconds
oba_test	enabled	true/false	NA
	time	1-36000	Seconds
fw_table	model	<string>	NA
	fwrevision	<string>	NA
	filename	<string>	NA
pi_type2_models	model	<string>	NA
smart_attibute	-	true/false	NA
read_stream_error_log	-	true/false	NA
write_stream_error_log	-	true/false	NA
device_statistics_log	-	true/false	NA
pending_defects_log	-	true/false	NA
hda_temperature_sct	-	true/false	NA

Below table describes the parameters and sample usage of *'osntf genfile'* command

Argument	Description
Mandatory Parameter	
ntf_type	NTF Test type (short: Short NTF, full: Full NTF, fullz: Full NTF with Zero filled)
Optional Parameter	
-od, --out_dir	Output directory for Json file (By default Json will be created in current working directory)

Note For <string> value in "model" parameters of "fw_table" and "pi_type2_models " sub-tests, model number should be taken from "query" command output
Example: "TOSHIBA MG10ACA18TE"

Example 1: osntf genfile command to generate short ntf run config.

```
tsbdrv osntf genfile short

Json file 'tsbdrv_sntfs_1680064933.json' created successfully for 'short' test.

Command return code: 0x00000000 [Command completed successfully]
```

Short NTF Config Details: `tsbdrv_sntfs_1680064933.json`

```
{
    "DrvCommonTool": {
        "ntfs": {
            "mode": 0,
            "sntfs": true,
            "steps": {
                "identify": true,
                "smart_data_check": {
                    "enabled": true,
                    "ltlimit": 0,
                    "mtlimit": 0,
                    "edlimit": 0,
                    "pclimit": 0,
                    "lulclimit": 0
                },
                "g_list": {
                    "enabled": true,
                    "glist": 0
                },
                "smart_status_check": true,
                "sensecode": false,
                "error_dup_check": true,
                "rnd_rd": {
                    "enabled": false,
                    "time": 300
                },
                "seq_rd_wr": {
                    "enabled": false,
                    "cycle": 5000,
                    "start_lba": 0
                },
                "butterfly": {
                    "enabled": false,
                    "cycle": 500,
                    "start_lba": 0,
                    "end_lba": 0
                },
                "rand_rd_wr": {
                    "enabled": false,
                    "cycle": 5000
                },
                "rand_rd_wr_cmp": {
                    "enabled": false,
                    "cycle": 5000
                },
```



```
                "detail": false,
                "all_wr": false,
                "oba_test": {
                    "enabled": false,
                    "time": 300
                },
                "fw_table": {
                    "model": "",
                    "fwrevision": "",
                    "filename": ""
                },
                "pi_type2_models": {
                    "model": ""
                },
                "smart_attribute": false,
                "read_stream_error_log": false,
                "write_stream_error_log": false,
                "device_statistics_log": false,
                "pending_defects_log": false,
                "hda_temperature_sct": false
            }
        }
    }
}
```


Example 2: osntf genfile command to generate full ntf run config.

```
tsbdrv osntf genfile full

Json file 'tsbdrv_fntfs_1680065197.json' created successfully for 'full' test.

Command return code: 0x00000000 [Command completed successfully]
```

Full NTF Config Details: `tsbdrv_fntfs_1680065197.json`


```
{
    "DrvCommonTool": {
        "ntfs": {
            "mode": 0,
            "fntfs": true,
            "steps": {
                "identify": true,
                "smart_data_check": {
                    "enabled": true,
                    "ltlimit": 0,
                    "mtlimit": 0,
                    "edlimit": 0,
                    "pclimit": 0,
                    "lulclimit": 0
                },
                "g_list": {
                    "enabled": true,
                    "glist": 0
                },
                "smart_status_check": true,
                "sensecode": false,
                "error_dup_check": true,
                "rnd_rd": {
                    "enabled": false,
                    "time": 300
                },
                "seq_rd_wr": {
                    "enabled": false,
                    "cycle": 5000,
                    "start_lba": 0
                },
                "butterfly": {
                    "enabled": false,
                    "cycle": 500,
                    "start_lba": 0,
                    "end_lba": 0
```



```
                },
                "rand_rd_wr": {
                    "enabled": false,
                    "cycle": 5000
                },
                "rand_rd_wr_cmp": {
                    "enabled": false,
                    "cycle": 5000
                },
                "detail": false,
                "dst_short": true,
                "all_surface_verify": true,
                "post_g_list": {
                    "enabled": true,
                    "glist": 0
                },
                "post_smart_status_check": true,
                "all_wr": false,
                "oba_test": {
                    "enabled": false,
                    "time": 300
                },
                "fw_table": {
                    "model": "",
                    "fwrevision": "",
                    "filename": ""
                },
                "pi_type2_models": {
                    "model": ""
                },
                "smart_attribute": false,
                "read_stream_error_log": false,
                "write_stream_error_log": false,
                "device_statistics_log": false,
                "pending_defects_log": false,
                "hda_temperature_sct": false
            }
        }
    }
}
```


Example 3: osntf genfile command to generate full ntf with zero write run config.

```
tsbdrv osntf genfile fullz -od ../../outdir/

Json file '../../outdir/tsbdrv_fntfsz_1680065264.json' created successfully for
'fullz' test.

Command return code: 0x00000000 [Command completed successfully]
```

Fullz NTF Config Details: `tsbdrv_fntfsz_1680065264.json`


```
{
    "DrvCommonTool": {
        "ntfs": {
            "mode": 0,
            "fntfsz": true,
            "steps": {
                "identify": true,
                "smart_data_check": {
                    "enabled": true,
                    "ltlimit": 0,
                    "mtlimit": 0,
                    "edlimit": 0,
                    "pclimit": 0,
                    "lulclimit": 0
                },
                "g_list": {
                    "enabled": true,
                    "glist": 0
                },
                "smart_status_check": true,
```



```
                "sensecode": false,
                "error_dup_check": true,
                "rnd_rd": {
                    "enabled": false,
                    "time": 300
                },
                "seq_rd_wr": {
                    "enabled": false,
                    "cycle": 5000,
                    "start_lba": 0
                },
                "butterfly": {
                    "enabled": false,
                    "cycle": 500,
                    "start_lba": 0,
                    "end_lba": 0
                },
                "rand_rd_wr": {
                    "enabled": false,
                    "cycle": 5000
                },
                "rand_rd_wr_cmp": {
                    "enabled": false,
                    "cycle": 5000
                },
                "detail": false,
                "dst_short": true,
                "all_surface_verify": true,
                "post_g_list": {
                    "enabled": true,
                    "glist": 0
                },
                "post_smart_status_check": true,
                "all_wr": true,
                "rnd_rd_cmp": {
                    "enabled": true,
                    "time": 300
                },
                "oba_test": {
                    "enabled": false,
                    "time": 300
                },
                "fw_table": {
                    "model": "",
                    "fwrevision": "",
                    "filename": ""
                },
                "pi_type2_models": {
                    "model": ""
                },
                "smart_attribute": false,
                "read_stream_error_log": false,
                "write_stream_error_log": false,
                "device_statistics_log": false,
                "pending_defects_log": false,
                "hda_temperature_sct": false
            }
        }
    }
}
```


5.15.2 OSNTF run

This command is used to run NTF test as per configuration file given by user in json format.

The syntax for this command is as follows:

```
tsbdrv osntf run <devid> <conf> [-od <value>]
```


By default the following optional parameters are specified: -od ""

“-od” parameter is valid only when json file entries: "sensecode" or "detail" are marked as true.

Below table describes the parameters and sample usage of ‘osntf run’ command

Argument	Description
Mandatory Parameter	
devid	Single device identifier or multiple device identifiers comma separated list [Max: 48 devid in list]
conf	Input Configuration file
Optional Parameter	
-od, --out_dir	Output directory (By default output file(s) will be created in current working directory)

Note

1. This command will skip any write operations for SMR drive(s)

Example 1: Osntf run command with short config file:

```
sbdrv osntf run sdc tsbdrv_sntfs_1586323426.json

On-Site NTF test started successfully for /dev/sdc.
On-Site NTF test progress: 100%
Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1586323731-46724.log' for details.
```

Example 2: Osntf run command with full config file:

```
tsbdrv osntf run sdh tsbdrv_fntfs_1559197619.json -od osntf_log

On-Site NTF test started successfully for /dev/sdc.
On-Site NTF test progress: 100%
Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1559213069-27732.log' for details.
```

Example 3: Osntf run command with fullz config file:

```
tsbdrv osntf run sdh tsbdrv_fntfsz_1559197623.json -od osntf_log

On-Site NTF test started successfully for /dev/sdc.
On-Site NTF test progress: 100%
Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1559213305-27802.log' for details.
```

Example 4: Osntf run command on multiple device:

```
tsbdrv osntf run sdc,sdd,sde tsbdrv_sntfs_1586323419.json

On-Site NTF test started successfully for /dev/sdc,sdd,sde.
On-Site NTF test progress: 100%
Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1586323494-44970.log' for details.
```

5.16 Decodelog

This command is used to analyze FE log data and judges the drive health. This command currently supports following drives only:

- MG04SC
- AL14SE
- AL15SE

- MG06SC
- MG07SC

The syntax of this command is as follows:

```
tsbdrv decodelog <model> [-inpath <value>] [-of <value>] [-od <value>]
```

Below table describes the parameters and sample usage of 'tsbdrv decodelog' command.

Argument	Description
Mandatory Parameter	
model	Model Number of the device whose binary log file is provided (MG04SC/AL14SE/AL15SE/MG06SC/MG07SC)
Optional Parameter	
-inpath	Input binary log file/directory. By default, current directory will be selected.
-of, --out_file	Output log filename. This option is valid when -inpath is log file.
-od, --out_dir	Output directory for decoded log files.

Note

1. Input(file_path + file_name) to '-od'/'-of' option should not be greater than 255 characters.
2. This command can process at max 255 log files only.
3. Decodelog command assumes that test system has sufficient space to save output log files.
4. Command will fail if both '-od' and '-of' options are provided.
5. For MG06SC/MG07SC models, input files will be processed in pairs. i.e, File_0x01.bin and File_0x20.bin should be available.

Example 1: Decode Log for all files available in CWD

```
 tsbdrv decodelog MG06SC


*********************************************************************
Result for input binary file : P0U4B151094621_0x01.bin
*********************************************************************
Pass
Reason of Pass or Fail                          : NTF
File name                                       : P0U4B151094621
Serial Number                                   : X8R0A049FJZF
Model Name                                      : MG06SCA10TE
Analysis Date                                   : 2019/10/24 18:21
F/W Revision                                    :
Power-on Time (in minutes)                      : 19 (0x13)
SMART trip (ASC:ASCQ)                           : 0x0:0x0
SMART trip failure                              : 0
Grown defect count                              : 12
Uncorrectable count                             : 0
Correctable count                               : 0
---------------------------------------------------------------------------
Device error log
Sense data with sense key = 3,4,B (Medium errors)
---------------------------------------------------------------------------


Sense data with sense key = 1 (Recovered errors)
```



```
--------------------------------------------------------------------------

**************************************************************************
Result for input binary file : P0U4B151101699_0x01.bin
**************************************************************************
Pass
Reason of Pass or Fail                              : NTF
File name                                           : P0U4B151101699
Serial Number                                       : X870A015FKEE
Model Name                                          : MG06SCA10TE
Analysis Date                                       : 2019/10/24 18:21
F/W Revision                                        :
Power-on Time (in minutes)                          : 7208 (0x1c28)
SMART trip (ASC:ASCQ)                               : 0x0:0x0
SMART trip failure                                  : 0
Grown defect count                                  : 0
Uncorrectable count                                 : 0
Correctable count                                   : 0
--------------------------------------------------------------------------
Device error log
Sense data with sense key = 3,4,B (Medium errors)
--------------------------------------------------------------------------
  SNS=B-4B-04:
    70 00 0b 00 00 00 00 28 00 00 00 00 4b 04 00 00
    00 00 00 28 01 02 09 00 00 00 00 00 00 00 00 00
    00 00 00 22 25 00 00 00 00 01 00 00 00 00 00 00
  SNS=B-4B-04:
    70 00 0b 00 00 00 00 28 00 00 00 00 4b 04 00 00
    00 00 00 28 01 02 09 00 00 00 00 00 00 00 00 00
    00 00 00 22 25 00 00 00 00 01 00 00 00 00 00 00

Sense data with sense key = 1 (Recovered errors)
--------------------------------------------------------------------------


------------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Decode Log for specific log file

```
 tsbdrv decodelog AL15SE -inpath P0U35353293512_0x01.bin

Pass
Reason of Pass or Fail                              : NTF
File name                                           : P0U35353293512
```



```
Serial Number                                        : 78B0A009FJEC
Model Name                                           : AL14SEB060N
Analysis Date                                        : 2019/10/24 18:28
F/W Revision                                         : 3502
Power-on Time (in minutes)                           : 7285 (0x1c75)
SMART trip (ASC:ASCQ)                                : 0x0:0x0
SMART trip failure                                   : 0
Grown defect count                                   : 0
Uncorrectable count                                  : 0
Correctable count                                    : 0
-------------------------------------------------------------------------
Device error log
Sense data with sense key = 3,4,B (Medium errors)
-------------------------------------------------------------------------



Sense data with sense key = 1 (Recovered errors)
-------------------------------------------------------------------------
Command return code: 0x00000000 [Command completed successfully]
-----------------------------------------------------------
```

Example 3: Decode Log command with –out_dir option

```
 tsbdrv decodelog AL14SE -inpath AL1415_bin_files/P0U46151037714_0x01.bin -od
AL_logs


*************************************************************************
Result for input binary file : P0U46151037714_0x01.bin
*************************************************************************
Fail
Reason of Pass or Fail                               : SMART Trip Error
File name                                            : P0U46151037714
Serial Number                                        : Y620A0DBFWWB
Model Name                                           : MG04SCA60EE
Analysis Date                                        : 2019/10/24 08:41
F/W Revision                                         : 0103
Power-on Time (in minutes)                           : 857918 (0xd173e)
SMART trip (ASC:ASCQ)                                : 0x5d:0x12
SMART trip failure                                   : 1
Grown defect count                                   : 261
Uncorrectable count                                  : 1
Correctable count                                    : 1
-------------------------------------------------------------------------
Device error log
Sense data with sense key = 3,4,B (Medium errors)
```



```
--------------------------------------------------------------------------------
  SNS=3-11-01:
    70 00 03 35 d8 e2 98 28 00 00 00 00 11 01 00 80
    00 3f 00 88 01 03 0a 06 01 5b 00 03 de 8f 01 12
    00 14 00 19 2f 40 00 14 c0 c0 06 03 de 8f ff ff

Sense data with sense key = 1 (Recovered errors)
--------------------------------------------------------------------------------
  SNS=1-17-03:
    f0 00 01 67 7e 85 30 28 00 00 00 00 17 03 00 80
    00 03 00 8f 01 03 0a 06 00 9f 00 00 9c 43 00 b5
    00 03 00 19 19 40 00 14 c0 c0 06 00 9c 42 ff ff
Command return code: 0x00000000 [Command completed successfully]


------------------------------------------------------------
```

Example 4: Decode Log command with –out_file option

```
tsbdrv decodelog MG07SC -inpath bin_files/MGseries/Disk_7_4_1_16_0x01.bin -of
sample.txt
********************************************************************************
Result for input binary file : Disk_7_4_1_16_0x01.bin
********************************************************************************
Pass
Reason of Pass or Fail                              : NTF
File name                                           : Disk_7_4_1_16
Serial Number                                       : 8820A08GFKEE
Model Name                                          : MG06SCA10TE
Analysis Date                                       : 2019/10/24 18:32
F/W Revision                                        :
Power-on Time (in minutes)                          : 1190 (0x4a6)
SMART trip (ASC:ASCQ)                               : 0x0:0x0
SMART trip failure                                  : 0
Grown defect count                                  : 0
Uncorrectable count                                 : 0
Correctable count                                   : 0
--------------------------------------------------------------------------------
Device error log
Sense data with sense key = 3,4,B (Medium errors)
--------------------------------------------------------------------------------


Sense data with sense key = 1 (Recovered errors)
--------------------------------------------------------------------------------


Command return code: 0x00000000 [Command completed successfully]
```



```
-----------------------------------------------------------
```

Example5: Invalid Decode Log command with both 'od' and 'of' options

```
tsbdrv decodelog AL14SE -inpath bin_files/ALseries/ -od output_logs/ALlogs/ -of
output_logs/ALlogs/sample1.txt

Command return code: 0x8000c600

TSBERR198: Invalid combination of parameters
```


5.17 Devdump

This command is used to collect the device dump log.

The syntax of this command is as follows:

```
tsbdrv devdump <devid> [-od <value>] [-x] [-CSL] [-w3008IR]
```

```
By default the following optional parameters are specified: -od ""
```

Below table describes the parameters and sample usage of 'tsbdrv devdump' command.

Argument	Description
Mandatory Parameter	
devid	Specific Device Identifier or 'all' to collect device dump of all supported devices
Optional Parameter	
-od, --out_dir	Output directory (By default log file will be created in application log directory)
-x, --exclusive	Run with exclusive lock operation on device
-CSL, --cmd_seq_log	Log mode [CSL: Command Sequence Log]
-w3008IR, --w3008IR	Enable workaround fix for LSI 3008IR long log collection time

Note

1. To dump CSL log, drive should have supported firmware (special firmware).
2. CSL option is ignored in case of not supported firmware
3. -w3008IR option should be used to reduce long log collection time only when LSI 3008 IR controller is available/connected to the machine. Otherwise, Invalid argument error will be thrown.
4. It is recommended to always use "-od" option in VMware ESXI environment.

Example 1: Device Dump for SATA device

```
 tsbdrv devdump sdu

/dev/sdu: Device binary dump file: '/var/log/toshiba/tsbdrv/dev_sdu-1743072416-
5410A0ZZF24L.bin'.

Device binary dump collection was successful on devices:
/dev/sdu

Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Device Dump for all supported devices

```
 tsbdrv devdump all


/dev/sdb: Device binary dump file: '/var/log/toshiba/tsbdrv/dev_sdb-1743078151-
5662K002FYVD.bin'.

/dev/sdc: Device binary dump file: '/var/log/toshiba/tsbdrv/dev_sdc-1743078167-
25D0A00JF09C.bin'.

Device binary dump collection was successful on devices:
/dev/sdb
/dev/sdc

Command return code: 0x00000000 [Command completed successfully]
```


Example 3: Device Dump with –out_dir option

```
 tsbdrv devdump sdb -od logs/

/dev/sdb: Device binary dump file: ‘logs/dev_sdb-1743078551-5662K002FYVD.bin'.

Device binary dump collection was successful on devices:
/dev/sdb

Command return code: 0x00000000 [Command completed successfully]
```

Example 4: devdump command with CSL option on Special Firmware

```
tsbdrv devdump sdb -CSL


/dev/sdb: Device binary dump file: ' /var/log/toshiba/tsbdrv/dev_sdb-1743078648-
5662K002FYVD.bin'.


Device binary dump collection was successful on devices:

/dev/sdb


Command return code: 0x00000000 [Command completed successfully]
```


5.18 Mediacache

This command is used to perform media cache flush operation on Drive Managed SMR Drives (MQ04 Model).

- Mediacache usage
- Mediacache init
- Mediacache flush

The syntax for this command and its subcommands is as follows:

```
tsbdrv mediacache usage <devid> [-xml] [-j] [-v]

tsbdrv mediacache init <devid> [-f] [-x] [-v]

tsbdrv mediacache flush <devid> [-x] [-v]
```

5.18.1 Mediacache usage

This command is used to read media cache usage status.

The syntax of this command is as follows:

```
tsbdrv mediacache usage <devid> [-xml] [-j] [-v]
```

Below table describes the sample usage of *'mediacache usage'* command:

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-xml, --xml	Display XML output
-j, --json	Display JSon output
-v, --verbose	Display verbose output

Example 1: Command to read media cache usage status.
 	
`tsbdrv mc usage /dev/sdb`
 	
`Media cache usage on /dev/sdb: 4%`
 	
`Command return code: 0x00000000 [Command completed successfully]`	

5.18.2 Mediacache init

This command is used to perform media cache initialization operation.

The syntax of this command is as follows:

```
tsbdrv mediacache init <devid> [-f] [-x] [-v]
```

Below table describes the sample usage of *'mediacache init'* command:

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-f, --force	Initialize forcefully (will loose all the data in media cache)
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output

Example 1: Command to perform media cache initilization operation.

```
tsbdrv mc init /dev/sdb

This operation will clear all the content of media cache.
Do you want to continue? [Y/n] y

WARNING: OPERATION 'Media cache initialization' MAY CAUSE DATA LOSS on
'/dev/sdb'.
Application will wait for '10 seconds' before starting 'Media cache
initialization' on device.
User can cancel the operation in this time frame either by pressing 'CTRL + C'
or by sending TERM signal to process.
..........
Continuing the operation...

/dev/sdb: Media cache initialization command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```

5.18.3 Mediacache flush

This command is used to perform media cache force flush operation.

The syntax of this command is as follows:

```
tsbdrv mediacache flush <devid> [-x] [-v]
```

Below table describes the sample usage of *'mediacache init'* command:

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-x, --exclusive	Run with exclusive lock operation on device
-v, --verbose	Display verbose output

Note

1. It is not recommended to start/initiate mc flush operation when any other command is running on the drive. Otherwise, this command may return failure.
2. No other operation can be performed on the drive when mc flush is in progress as the drive remains in busy state until mc flush operation is complete

Example 1: Command to Perform media cache flush operation.

```
tsbdrv mc flush sdb

WARNING: MEDIA CACHE FLUSH OPERATION MAY TAKE VERY-VERY LONG TIME DEPENDING ON
THE DISK CAPACITY AND CURRENT MEDIA CACHE USAGE.
         (FOR 1 TB DISK, IT MAY TAKE 7-8 HOURS.)
         DO NOT CANCEL THE OPERATION OR PERFORM ANY OTHER OPERATION ON DISK.
THIS MAY CAUSE LOSS OF DATA.

/dev/sdb: Media cache flush command completed successfully.

Command return code: 0x00000000 [Command completed successfully]
```


5.19 Logdiag

This command is used to diagnose input binary log file of SATA Drives and produces a 64-bit output result. Binary log file should be SATA Internal log area1 without any clipping.

In case of invalid binary input file, command returns 0x2020 (File Error - Drive internal log file is incorrect)

The syntax of this command is as follows:

```
tsbdrv logdiag <infile> <model>
```

Below table describes the parameters and sample usage of 'tsbdrv logdiag' command.

Argument	Description
Mandatory Parameter	
infile	input binary file.
model	Drive model of input binary file (MG06ACA/MG07ACA/MG08ACA)

Note

1. This command is supported only on the following drive models: SATA MG06ACA, MG07ACA, MG08ACA

Example 1: Perform log diagnostics for MG07 bin file

```
tsbdrv logs internal sdc A1 --nohex --bin_dump
Binary dump file (mode 'A1') : './tsbdrv-1612438963-dev_sdc-0b-0-0-
79L0A2MEFDUG.bin'
Command return code: 0x00000000 [Command completed successfully]


tsbdrv logdiag tsbdrv-1612438963-dev_sdc-0b-0-0-79L0A2MEFDUG.bin MG07ACA
Log diagnostics started...
Log Diagnostics completed...
Test Result: Head Failure - VMM value has been changed during operation
Command return code: 0x00000000 [Command completed successfully]
```

Example 2: Invalid Model

```
tsbdrv logdiag tsbdrv-1612438963-dev_sdc-0b-0-0-79L0A2MEFDUG.bin MG07SCA
Command return code: 0x80002b00
TSBERR43: Unsupported device type


See log file '/var/log/toshiba/tsbdrv/tsbdrv-1612263429-14227.log' for details.
```

Example 3: Invalid binary file

```
tsbdrv logdiag invalid.bin MG07ACA
Log diagnostics started...


Log Diagnostics completed...


Test Result: File Error - Drive internal log file is incorrect


Command return code: 0x00000000 [Command completed successfully]
```


5.20 Genfile

This command is used to generate configuration file for specified operation.

The syntax of this command is as follows:

```
tsbdrv genfile <gen_type> [-od <value>]
```

```
By default, the following optional parameters are specified: -od ""
```

Following gen_type(s) are supported:

gen_type	Description
To be updated in future	-

Below table describes the parameters and sample usage of 'tsbdrv genfile' command.

Argument	Description
Mandatory Parameter	
gen_type	Generate output file for selected operation.
Optional Parameter	
-od, --out_dir	Output directory (By default output file will be created in current working directory)

5.21 Analyze

This command is used to analyze specific parameter(s) of the drive.

The syntax for this command is as follows:

```
tsbdrv analyze <sub-command> [arglist]
```

Following sub-commands are supported:

sub-command	Description
Smartntf	Analyzes specific smart parameters and provides judgement

5.21.1 Analyze smartntf

This command is used to analyse drive health via smart parameters.

The syntax for this command is as follows:

```
tsbdrv analyze smartntf <devid> [-v]
```

Below table describes the parameters and sample usage of *'analyze smartntf'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier
Optional Parameter	
-v, --verbose	Display verbose output

Following table defines the Error return code of this command only. For other return codes, refer Section 7.

Error return code	Error String
0x00000001	Smart Status Error
0x00000002	Smart Attribute Check Error
0x00000003	Error is registered
0x00000004	DST error is registered

Example 1: Drive detected as NTF

```
tsbdrv analyze smartntf sdi

SMART NTF Judgement for /dev/sdi: PASS
Command return code: 0x00000000 [Command completed successfully]

See log file '/var/log/toshiba/tsbdrv/tsbdrv-1632476978-7259.log' for details.
```

Example 2: Drive detected as TF (Smart Status Error)

```
tsbdrv analyze smartntf sdx

SMART NTF Judgement for /dev/sdx: FAIL
Command return code: 0x00000001 (Smart Status Error)


See log file '/var/log/toshiba/tsbdrv/tsbdrv-1632476816-5961.log' for details.
```


Example 3: Drive detected as TF (Smart Attribute Check Error)

```
tsbdrv analyze smartntf sdb

SMART NTF Judgement for /dev/sdb: FAIL
Command return code: 0x00000002 (Smart Attribute Check Error)


See log file '/var/log/toshiba/tsbdrv/tsbdrv-1632476614-4530.log' for details.
```

Example 4: Drive detected as TF (Error is registered)

```
tsbdrv analyze smartntf sdc

SMART NTF Judgement for /dev/sdc: FAIL
Command return code: 0x00000003 (Error is registered)


See log file '/var/log/toshiba/tsbdrv/tsbdrv-1632476851-6290.log' for details.
```


5.22 Tcg

This command is used for TCG drive management.

The syntax for this command is as follows:

```
tsbdrv tcg <sub-command> [arglist]
```

Following sub-commands are supported:

sub-command	Description
status	Displays TCG status on device
discovery0	Displays level0 discovery data

5.22.1 Tcg status

This command is used to display tcg status on device.

The syntax for this command is as follows:

```
tsbdrv tcg status <devid> [-xml] [-j] [-v]
```

Below table describes the parameters and sample usage of *'tcg status''* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier(Single device ID or 'all' to display TCG status of all devices)
Optional Parameter	
-v, --verbose	Display verbose output
-xml, --xml	Display XML output
-j, --json	Display JSon output

Example 1: Display tcg status of SAS drive
 	
`tsbdrv tcg status sda`
 	
`TCG status::`
 	
`PHYSICAL-DRIVE MODEL-NUMBER SERIAL-NUMBER`
`DEV-TYPE TCG-SUPPORT TCG-TYPE PSID-SUPPORT LOCKED`
`----------`
`----------`
`/dev/sda MG10SFP22TA E 93U0A0LJFKUJ`
`SCSI Yes Enterprise Yes No.`	

5.22.2 Tcg discovery0

This command is used to display level0 discovery data.

The syntax for this command is as follows:

```
tsbdrv tcg discovery0 <devid> [-ftr <value>] [-xml] [-j] [-hex] [-v]
```

```
By default the following optional parameters are specified: -ftr all
```

Below table describes the parameters and sample usage of *'tcg discovery0'* command

Argument	Description
Mandatory Parameter	
devid	Device Identifier

Optional Parameter	
-ftr, --feature	Discovery0 feature type (tper: TPer, lock: Locking, geo:Geometry reporting, ssc: Supported SSC, ds: Datastore,ports: Logical ports, all: All features)
-v, --verbose	Display verbose output
-xml, --xml	Display XML output
-j, --json	Display JSon output
-hex,--hex	Display Hex Dump output

Example 1: Display tcg discovery data of drive

```
tsbdrv tcg discovery0 sdq

TCG Level0 Discovery data for '/dev/sdq'::

Vendor Data ::
----------------------------------------------------------------
    Vendor Version                                  : 1
    Vendor Specific State Information               : 0
    MB Support                                      : 1
    CDL Support                                     : 1
    ESD Support                                     : 1
    Diag Support                                    : 1
    Dload Support                                   : 1
    Locking Support                                 : 1
    FDE Support                                     : 1
    MB Enabled                                      : 0
    CDL Enabled                                     : 0
    ESD Enabled                                     : 1
    Diag Enabled                                    : 1
    Dload Enabled                                   : 0
    Locking Enabled                                 : 0
    FDE Enabled                                     : 1


TPer Feature [0x0001]::
----------------------------------------------------------------
    CommId Management Support                       : 0
    Streaming Support                               : 1
    Buffer Management Support                       : 0
    ACK/NAK Support                                 : 0
    Asynchronous Protocol Support                   : 0
    Synchronous Protocol Support                    : 1


Locking Feature [0x0002]::
----------------------------------------------------------------
    MBR Done                                        : 0
    MBR Enabled                                     : 0
    Media Encryption                                : 1
    Locked                                          : 0
    Locking Enabled                                 : 1
    Locking Support                                 : 1


Enterprise SSC Feature [0x0100]::
----------------------------------------------------------------
    Base ComID                                      : 7FE
    Number of ComIDs                                : 2
    Range Crossing Behavior                         : 0

Command return code: 0x00000000 [Command completed successfully].
```


6. Packaged Test Scripts

TSBDRV tool installer contains python based wrapper scripts for tsbdrv commands which can be modified according to updates/changes in requirements.

Note **Pre-requisite:** "Python-2.7.12" software application & "TSBDRV tool" must be installed before running these scripts.
Location for Scripts:
On Linux : /opt/toshiba/tsbdrv/scripts/
On Windows: %PROGRAMFILES%\TOSHIBA\TSBDRV\scripts\

6.1 smart_data_csv.py

Purpose of this wrapper script is to query drive attributes and log the device information in CSV format file.

The syntax for this command is as follows:

```
"python smart_data_csv.py <CsvFileName>"
```

Below table describes the sample usage of '**smart_data_csv.py**' script:

Argument	Description
Mandatory Parameter	
CsvFileName	File name in which CVS format output will be redirected.
Optional Parameter	
-h	To know the usage of the script.

Example 1: Query drive attributes and log output in CSV format.

```
python  smart_data_csv.py QueryDevices.csv
```

Note This script will generate "QueryDevices.csv" file which can be viewed by using "Microsoft Excel" application.

6.2 self_test.py

Purpose of this wrapper script is to check the health of one or more devices (user can pass comma separated multiple devices or single device id). This script does health check-up at 3 levels as below:

1. Performs self-test: Script runs 'short' or 'long' self-test as specified by user. Self-test is polled for the completion until either the self-test completes or timeout occurs. Final result is printed along with judgment.
2. SMART error detection: Script checks for any of the error presence (in SMART error log) on device. It expects that there should not be any error in SMART error log.
3. SMART-trip check: Last check is done for the SMART-trip failure.

The syntax for this command is as follows:

```
"python self_test.py [-h] -dev <DEVICE_NAME> [-dev_type <DEVICE_TYPE>] [-test_type
<TEST_TYPE>]  [-t <TIMEOUT>] [-p <POLLING_TIME>] [-s] [-v]"
```

Below table describes the sample usage of 'self_test.py' script:

Argument	Description
Mandatory Parameter	
-dev `DEVICE_NAME`	Device Identifier (Single device ID or comma separated list of device ids or 'all' to run on all devices)
Optional Parameter	
-dev_type	Specific type of device either ATA , SCSI.
-test_type	self-test type either as "short" or "long" can be passed with this option. [Default : short]
-t	Timeout value waiting for completion of selftest in Minutes [Default : 4 Minutes for short , 60 Minutes for long self-test]
-p	Time in seconds waiting for the next polling. [Default :10 seconds for short , 60 seconds for long]
-h	Show this help message & usage.
-v	verbose option to print command & execution logs on Screen.
-s	silent option.

Example 1: Run default i.e. short self-test on all connected devices.

```
python  self_test.py -dev all
```

Example 2: Run default i.e. short self-test on ATA **types devices only, Similarly we can run on SCSI device too.**

```
python  self_test.py -dev all -dev_type "ATA"
```

Example 3: Run short self-test on comma separated devices with default timeout & polling time.

```
python  self_test.py -dev sda, sdb
```

Example 4: Run short self-test on specific device with default timeout & polling time.

```
python  self_test.py -dev sda -test_type short
```

Example 5: Run long self-test on specific device with default timeout & polling time.

```
python  self_test.py -dev sdc -test_type long
```

Example 6: Run short self-test on specific device with timeout as 15 **Minutes & polling time as** 5 **seconds , Similarly long self-test can be run by specifying** "long" **as value with** -test_type **option.**

```
python  self_test.py -dev sdf -test_type short -t 15 -p 5
```

Note

1. Log file with commands, command outputs & some additional information like status of the test will be generated at the same location from where you are running this script. An example of log file is "**selftest_logs_14_09_2016_15_29_02**".

6.3 read_multiple_log_pages.py

Purpose of this wrapper script is to read multiple log pages from the specific device.

The syntax for this command is as follows:

"python read_multiple_log_pages.py <DeviceId> <LogAddress>"

Below table describes the sample usage of '`read_multiple_log_pages.py`' script:

Argument	Description
Mandatory Parameter	
DeviceId	Name of the device.
LogAddress	Page address from the 'tsbdrv logs directory <DeviceId>' command or User can mention 'all'to print all logs from respective page addresses.

Example 1: Read multiple log pages from device.

```
tsbdrv logs directory sdc

Log Directory: /dev/sdc
GPL Directory
LOG ADDRESS                                          PAGE COUNT
-------------------------------------------------------------
[0x00] General Purpose Log directory                        1
[0x03] Extended Comprehensive Smart Error Log              64
[0x04] Device Statistics                                    8
[0x07] Extended Smart Self-test Log                         1
[0x10] NCQ Command Error Log                                1
[0x11] SATA PHY Event Counters Log                          1
[0x30] Identify Device Data Log                             9
[0x80] Host Specific Log                                   16
[0x81] Host Specific Log                                   16
...
...
…
[0x9F] Host Specific Log                                   16
[0xE0] SCT Command/status Log                               1
[0xE1] SCT Data Transfer Log                                1

Command return code: 0x00000000 [Command completed successfully]
```

Example 1: To reads Specific page of log address and prints the Hex dump.

```
python read_multiple_log_pages.py sdb  0x2f
```

Example 2: To reads multiple pages of log address and prints the Hex dump.

```
python read_multiple_log_pages.py sdb  0x2f,0x0D
```

Example 3: To reads all page of log address and prints the Hex dump.

```
python read_multiple_log_pages.py /dev/sdb all
```

6.4 fw_download_read_log.py

Purpose of this wrapper script is to update firmware on device and to dump Log Pages from log address 0x24.

The syntax for this command is as follows:

"python fw_download_read_log.py <DeviceId> <FwImagePath> <LogPageRange>

<DataSaftyFlag>"

Below table describes the sample usage of 'fw_download_read_log.py' script:

Argument	Description
Mandatory Parameter	
DeviceId	Name of the device (e.g. sda).
FwImagePath	Firmware image/package file path

LogPageRange	LogPageRange (e.g. 0-100)
Optional Parameter	
DataSaftyFlag	Forces firmware download even if there is a possibility of user data loss. User must pass "-n".

Example 1: Update firmware on device and to dump Log Pages from log address 0x24.

```
python fw_download_read_log.py sdc ./THNSNJ960PCSZ/JZEE6102.enc 0-1 -n
```

Note Log address “0x24” is hard coded in the script due to customer’s requirement. We can modify the same script for other log address by simply replacing “0x24” with any of the available log page addresses as in command output by “tsbdrv logs directory <DeviceId>”.

6.5 fw_download_On_Multiple.py

Purpose of this wrapper script is to download firmware on multiple devices.

With this python wrapper script, we have omitted below limitations with ‘tsbdrv firmware download’ command:

a. 32 number of comma separated devices can be passed in single firmware download command.

b. All devices should be of same type or model.

The syntax for this command is as follows:

“python ./fw_download_On_Multiple.py <Config_File> [DataSaftyFlag]”

Below table describes the sample usage of ‘`fw_download_On_Multiple.py`’ script:

Argument	Description
Mandatory Parameter	
Config_File	Text file which contains comma separated list of devices & respective firmware separated by colon(:). Sample configuration file should looks like, sda,sdc:/tmp/FW/SAS/MG03SCA300/H2DG09.BIN sdd,sde,sdh:/tmp/FW/SAS/MG03SCA200/H2DG09.BIN
Optional Parameter	
DataSaftyFlag	Forces firmware download even if there is a possibility of user data loss. User must pass "-n".

Example 1: Print help section.

python fw_download_On_Multiple.py -h

usage: python ./fw_download_On_Multiple.py <Config_File> [DataSaftyFlag]

Update firmware on devices with respective firmware file.

Config_File : Text file which contains comma separated list of devices & respective firmware separated by colon(:).

Sample configuration file should looks like,

sda,sdc:/tmp/FW/SAS/MG03SCA300/H2DG09.BIN
sdd,sde,sdh:/tmp/FW/SAS/MG03SCA200/H2DG09.BIN

DataSaftyFlag : It's optional parameter which forces firmware download even if there is a possibility of user data loss. User must pass "-n"

Example 2: Firmware downloads on multiple devices by using configuration file.

Sample Configuration File:

```
# cat frmdev.lin
sde,sdb:/Home/SATA/THNSNJ960PCSZ/JZEE6102.enc
sda:/home/SAS/14SEDM05.bin

# python fw_download_On_Multiple.py    frmdev.lin

Command to be executed -  "tsbdrv" firmware download sde
/home/SATA/THNSNJ960PCSZ/JZEE6102.enc  -s
Error :

/dev/sde: Firmware download failed on device [TSBERR38: ATA Download Microcode failed].
Firmware download failed on following device(s):
/dev/sde

TSBERR38: ATA Download Microcode failed

Command to be executed -  "tsbdrv" firmware download sdb
/home/SATA/THNSNJ960PCSZ/JZEE6102.enc  -s
Output :
Current firmware 'JZEE6102' will be updated on device '/dev/sdb'.
This may cause data loss.

/dev/sdb: FIRMWARE DOWNLOAD IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...

/dev/sdb: Firmware download and activation command completed successfully.

Firmware download was successful on following device(s):
/dev/sdb

Command return code: 0x00000000 [Command completed successfully]

Command to be executed -  "tsbdrv" firmware download sda /home/SAS/14SEDM05.bin  -s
Output :
Current firmware 'TB41' will be updated on device '/dev/sda'.
This may cause data loss.

/dev/sda: FIRMWARE DOWNLOAD IS STARTED.
WARNING: DO NOT POWER OFF THE SYSTEM OR CANCEL THE PROCESS DURING THIS
OPERATION. THE DRIVE MAY GO IN AN INCONSISTENT STATE.
THIS MAY TAKE SOME TIME. PLEASE WAIT...

/dev/sda: Firmware download command completed successfully.

Please perform 'System Reboot' to activate the firmware.

Firmware download was successful on following device(s):
```



```
/dev/sda

Command return code: 0x00000001 [Command completed successfully, 'System Reboot' required]
********************************************************************************
ERROR: Firmware download failed on following device(s), Kindly refer respective logs for errors in detail.

Firmware download failed on device "sde" due to below reasons,
/dev/sde: Firmware download failed on device [TSBERR38: ATA Download Microcode failed].
Firmware download failed on following device(s):
/dev/sde

TSBERR38: ATA Download Microcode failed
```

6.6 drv_fault_detection_ntf.py

Purpose of this script is to help run NTF test on multiple drives attached to system. This script gives user flexibility to select drives by device id or serial number. Also, if NTF Test fails on drive(s) then user can optionally run error duplication test on failed drives.

The syntax for this command is as follows:

"python drv_fault_detection_ntf.py"

Below table describes the sample usage of 'drv_fault_detection_ntf.py' script:

Argument	Description
Optional Parameter	
-h/--help	Script help information.

Example 1: Two drives selected for NTF test by user.

```
#-------------------------------------------------------------------------------#

#------------- TSB Tool For Identifying and Handling Drive Fault --------------#

-------------------------------------------------------------------------
PHYSICAL_DRIVE SERIAL_NUMBER MODEL_NUMBER                          DEV_TYPE
-------------------------------------------------------------------------
/dev/sda       HP            LOGICAL VOLUME                        UNKNOWN
/dev/sdb       9XF3HNWX      MM0500GBKAK                           ATA
/dev/sdc       9XF3HRNM      MM0500GBKAK                           ATA
/dev/sdd       9XF3GZCD      MM0500GBKAK                           ATA
/dev/sde       264BW0PRT     TOSHIBA MQ01ACF032                    ATA
/dev/sdf       8680A001A1UC  PX04SVB080                            SCSI
/dev/sdg       72Q0A02BFRD6  AL13SEB300                            SCSI
/dev/sdh       6540A010FJ8B  AL13SXB600N                           SCSI
/dev/sdi       911FB00VB     TOSHIBA MQ01ABD050                    ATA
/dev/sdj       25D0A00JF09C  AL14SEB060N                           SCSI
-------------------------------------------------------------------------

Kindly enter comma separated drive serial numbers e.g. ASDDXX123G, XGPDDXX123K
OR Drive ID e.g. /dev/sda, /dev/sdc
OR Type all/ALL to select all devices:  /dev/sde, 72Q0A02BFRD6

#---------------------------- NTF Test Execution -----------------------------#

264BW0PRT(/dev/sde): NTF Test ..............................Started
264BW0PRT(/dev/sde): NTF Test ..............................Passed

72Q0A02BFRD6(/dev/sdg): NTF Test ...........................Started
72Q0A02BFRD6(/dev/sdg): NTF Test ...........................Passed


#-------------------------List of Successful Drives--------------------------#
```



```
-------------------------------------------------------
PHYSICAL_DRIVE SERIAL_NUMBER MODEL_NUMBER       DEV_TYPE
-------------------------------------------------------
/dev/sde       264BW0PRT     TOSHIBA MQ01ACF032 ATA
/dev/sdg       72Q0A02BFRD6  AL13SEB300         SCSI
-------------------------------------------------------


#----------------------------List of Failed Drives-----------------------------#

There are no Drives To List Here.


Kindly Check Test Log at /home/ojas/2019-01-30_17.57.06.692748.
```

Example 2: One drive fails in NTF test and succeed in Error Duplication Test.

```
#------------------------------------------------------------------------------#

#------------- TSB Tool For Identifying and Handling Drive Fault --------------#

-------------------------------------------------------------------------------
PHYSICAL_DRIVE SERIAL_NUMBER MODEL_NUMBER                        DEV_TYPE
-------------------------------------------------------------------------------
/dev/sda       HP            LOGICAL VOLUME                      UNKNOWN
/dev/sdb       9XF3HNWX      MM0500GBKAK                         ATA
/dev/sdc       9XF3HRNM      MM0500GBKAK                         ATA
/dev/sdd       9XF3GZCD      MM0500GBKAK                         ATA
/dev/sde       264BW0PRT     TOSHIBA MQ01ACF032                  ATA
/dev/sdf       8680A001A1UC  PX04SVB080                          SCSI
/dev/sdg       72Q0A02BFRD6  AL13SEB300                         SCSI
/dev/sdh       6540A010FJ8B  AL13SXB600N                         SCSI
/dev/sdi       911FB00VB     TOSHIBA MQ01ABD050                  ATA
/dev/sdj       25D0A00JF09C  AL14SEB060N                         SCSI
-------------------------------------------------------------------------------

Kindly enter comma separated drive serial numbers e.g. ASDDXX123G, XGPDDXX123K
OR Drive ID e.g. /dev/sda, /dev/sdc
OR Type all/ALL to select all devices: 72Q0A02BFRD6,CM5-TSBDRV

#----------------------------- NTF Test Execution -----------------------------#
72Q0A02BFRD6(/dev/sdg): NTF Test .............................Started
72Q0A02BFRD6(/dev/sdg): NTF Test .............................Passed


#-------------------- NTF Test FAILED for following drives --------------------#

CM5-TSBDRV(/dev/sdb): TSBERR144: identify command failed

WARNING: Error Duplication and Recovery Test can cause Data Loss!
Kindly enter comma separated drive serial numbers e.g. ASDDXX123G, XGPDDXX123K
OR Drive ID e.g. /dev/sda, /dev/sdc
OR Type all/ALL to select all Failed devices for Error Duplication Test
OR Press [Enter] To skip this test.: /dev/sdc

#-----------------Error Duplication & Recovery Test Execution------------------#

CM5-TSBDRV(/dev/sdc): ErrorDup Test .......................Started
CM5-TSBDRV(/dev/sdc): ErrorDup Test .......................Passed

#--------------------------List of Successful Drives---------------------------#

-------------------------------------------------
PHYSICAL_DRIVE SERIAL_NUMBER MODEL_NUMBER DEV_TYPE
-------------------------------------------------
/dev/sdg       72Q0A02BFRD6  AL13SEB300   SCSI
-------------------------------------------------


#----------------------------List of Failed Drives-----------------------------#
```



```
There are no Drives To List Here.


Kindly Check Test Log at /home/ojas/2019-01-30_18.17.36.428030.
```

Example 3: Drive Fails in both Test(NTF & Error Duplication test)

```
#-------------------------------------------------------------------------------#

#------------- TSB Tool For Identifying and Handling Drive Fault --------------#

-------------------------------------------------------------------------
PHYSICAL_DRIVE SERIAL_NUMBER MODEL_NUMBER                      DEV_TYPE
-------------------------------------------------------------------------
/dev/sda       HP            LOGICAL VOLUME                    UNKNOWN
/dev/sdb       9XF3HNWX      MM0500GBKAK                       ATA
/dev/sdc       9XF3HRNM      MM0500GBKAK                       ATA
/dev/sdd       9XF3GZCD      MM0500GBKAK                       ATA
/dev/sde       264BW0PRT     TOSHIBA MQ01ACF032                ATA
/dev/sdf       8680A001A1UC  PX04SVB080                        SCSI
/dev/sdg       72Q0A02BFRD6  AL13SEB300                        SCSI
/dev/sdh       6540A010FJ8B  AL13SXB600N                       SCSI
/dev/sdi       911FB00VB     TOSHIBA MQ01ABD050                ATA
/dev/sdj       25D0A00JF09C  AL14SEB060N                       SCSI
-------------------------------------------------------------------------

Kindly enter comma separated drive serial numbers e.g. ASDDXX123G, XGPDDXX123K
OR Drive ID e.g. /dev/sda, /dev/sdc
OR Type all/ALL to select all devices: 72Q0A02BFRD6,CM5-TSBDRV

#------------------------------ NTF Test Execution -----------------------------#

CM5-TSBDRV(/dev/sdc): NTF Test ............................Started
CM5-TSBDRV(/dev/sdc): NTF Test ............................Failed

72Q0A02BFRD6(/dev/sdg): NTF Test ............................Started
72Q0A02BFRD6(/dev/sdg): NTF Test ............................Passed


#--------------------- NTF Test FAILED for following drives --------------------#

CM5-TSBDRV(/dev/sdc): TSBERR144: identify command failed

WARNING: Error Duplication and Recovery Test can cause Data Loss!
Kindly enter comma separated drive serial numbers e.g. ASDDXX123G, XGPDDXX123K
OR Drive ID e.g. /dev/sda, /dev/sdc
OR Type all/ALL to select all Failed devices for Error Duplication Test
OR Press [Enter] To skip this test.: /dev/sdc

#-----------------Error Duplication & Recovery Test Execution------------------#

CM5-TSBDRV(/dev/sdc): ErrorDup Test .......................Started
CM5-TSBDRV(/dev/sdc): ErrorDup Test .......................Failed


#------- ERROR Duplication & Recovery Test FAILED for following drives --------#

CM5-TSBDRV(/dev/sdc): TSBERR144: identify command failed


#--------------------------List of Successful Drives---------------------------#

-------------------------------------------------
PHYSICAL_DRIVE SERIAL_NUMBER MODEL_NUMBER DEV_TYPE
-------------------------------------------------
/dev/sdg       72Q0A02BFRD6  AL13SEB300   SCSI
-------------------------------------------------
```



```
#----------------------------List of Failed Drives-----------------------------#

--------------------------------------------------
PHYSICAL_DRIVE SERIAL_NUMBER MODEL_NUMBER DEV_TYPE
--------------------------------------------------
/dev/sdc     CM5-TSBDRV    12345   ATA
--------------------------------------------------


Kindly Check Test Log at /home/ojas/2019-01-30_18.25.15.865266.
```


7. Return Codes

7.1 Return code structure

TSBDRV tool gives a detailed Return codes which is of 32 bit length.

This Return code is printed in the log file error code which has following format

Bit(s)	Description
31	Command failure status (1: Failed, 0: Passed)
30	Reserved for firmware download status
29	Reserved for firmware download status
28:23	(internal use)
22:16	Reserved
15:8	Command status code (see 7.1.1 for details)
7:0	Action code (see 7.1.2 for details)

7.1.1 Command status code

Status	Code	Description
0x00	TSBERR0	Command completed successfully
0x01	TSBERR1	Command completed with an error
0x02	TSBERR2	Instance is not initialized
0x03	TSBERR3	Invalid argument specified
0x04	TSBERR4	Invalid Firmware File Size
0x05	TSBERR5	No devices found
0x06	TSBERR6	Invalid buffer length
0x07	TSBERR7	Buffer index out of bound
0x08	TSBERR8	Insufficient memory
0x09	TSBERR9	Invalid module code
0x0A	TSBERR10	Invalid status type code
0x0B	TSBERR11	Invalid error code
0x0C	TSBERR12	Invalid message id
0x0D	TSBERR13	Opening the device failed
0x0E	TSBERR14	Get Device Detailed Data failed
0x0F	TSBERR15	Get Device Class failed
0x10	TSBERR16	File open failed
0x11	TSBERR17	File close failed
0x12	TSBERR18	Invalid file pointer
0x13	TSBERR19	Query on device failed
0x14	TSBERR20	Duplicate optional argument
0x15	TSBERR21	Invalid string
0x16	TSBERR22	Unsupported event type
0x17	TSBERR23	Argument not specified for option
0x18	TSBERR24	Invalid option
0x19	TSBERR25	Invalid argument
0x1A	TSBERR26	Back end handler not in list
0x1B	TSBERR27	Could not parse command list
0x1C	TSBERR28	Empty document

0x1D	TSBERR29	Unknown parameter
0x1E	TSBERR30	Missing parameter
0x1F	TSBERR31	Unknown parameter type
0x20	TSBERR32	PARAM_TYPE not defined
0x21	TSBERR33	Regular expression not defined
0x22	TSBERR34	Regular expression compile failed
0x23	TSBERR35	Invalid parameter value
0x24	TSBERR36	Regular expression exec failed
0x25	TSBERR37	ATA Identify failed
0x26	TSBERR38	ATA Download Microcode failed
0x27	TSBERR39	ATA Smart Command failed
0x28	TSBERR40	ATA Microcode Activation failed
0x29	TSBERR41	SCSI Download Microcode failed
0x2A	TSBERR42	SCSI Smart Command failed
0x2B	TSBERR43	Unsupported device type
0x2C	TSBERR44	Firmware download passed NOP Required
0x2D	TSBERR45	Firmware download passed Reboot Required
0x2E	TSBERR46	Firmware download passed Power Down required
0x2F	TSBERR47	Firmware download passed Power Cycle Required
0x30	TSBERR48	Firmware download passed Full Power Down required
0x31	TSBERR49	Firmware download passed Full Power Cycle required
0x32	TSBERR50	Firmware download incomplete NOP Required
0x33	TSBERR51	Firmware download incomplete Reboot Required
0x34	TSBERR52	Firmware download incomplete Power Down required
0x35	TSBERR53	Firmware download incomplete Power Cycle Required
0x36	TSBERR54	Firmware download incomplete Full Power Down required
0x37	TSBERR55	Firmware download incomplete Full Power Cycle required
0x38	TSBERR56	Not a regular file
0x39	TSBERR57	Not a directory
0x3A	TSBERR58	User doesn't have write permission on file/directory
0x3B	TSBERR59	File read failed
0x3C	TSBERR60	File write failed
0x3D	TSBERR61	Aborting as given file is not a firmware package file
0x3E	TSBERR62	Aborting as invalid or corrupt firmware package file
0x3F	TSBERR63	Aborting as given file is already a firmware package file
0x40	TSBERR64	Operation cancelled by user
0x41	TSBERR65	Firmware downgrade or update to same version not allowed
0x42	TSBERR66	Aborting as operation may cause data loss
0x43	TSBERR67	ATA Set Secure Password Failed
0x44	TSBERR68	ATA Secure Erase Prepare Failed
0x45	TSBERR69	ATA Secure Erase Failed
0x46	TSBERR70	SCSI Set Secure Password Failed
0x47	TSBERR71	SCSI Secure Erase Prepare Failed
0x48	TSBERR72	SCSI Secure Erase Failed
0x49	TSBERR73	Drive is in frozen state and needs hardware reset/power down

0x4A	TSBERR74	Security Level set to maximum. Enter user password
0x4B	TSBERR75	Security commands unsupported
0x4C	TSBERR76	Drive in unknown secure state
0x4D	TSBERR77	Enhanced secure erase mode unsupported by drive
0x4E	TSBERR78	Invalid date argument
0x4F	TSBERR79	Device Configuration Overlay unsupported
0x50	TSBERR80	DCO Identify failed
0x51	TSBERR81	DCO Restore failed
0x52	TSBERR82	DCO Set failed
0x53	TSBERR83	Feature unsupported
0x54	TSBERR84	Set feature command failed
0x55	TSBERR85	SATA Feature enable/disable not supported
0x56	TSBERR86	DMA Operation not supported on device
0x57	TSBERR87	SMART Feature not supported on device
0x58	TSBERR88	GPL access not support on log address
0x59	TSBERR89	SMART access not support on log address
0x5A	TSBERR90	Download Microcode command is not supported on device
0x5B	TSBERR91	Specified LBA is more than maximum supported LBA
0x5C	TSBERR92	Start and end LBA for SPAN can not be 0
0x5D	TSBERR93	Test SPAN overlap with each other
0x5E	TSBERR94	Open udev failed on system
0x5F	TSBERR95	Given device is not block device
0x60	TSBERR96	Udev can not find specified device
0x61	TSBERR97	SGL IO is not supported
0x62	TSBERR98	Segmented download is not safe
0x63	TSBERR99	Memory mapping of file failed
0x64	TSBERR100	Read log command failed
0x65	TSBERR101	Write log command failed
0x66	TSBERR102	SMART Read log command failed
0x67	TSBERR103	SMART Write log command failed
0x68	TSBERR104	SMART Enable operations failed
0x69	TSBERR105	SMART Disable operations failed
0x6A	TSBERR106	SMART Execute immediate offline command failed
0x6B	TSBERR107	CDB Length not supported
0x6C	TSBERR108	SCSI Read Media Serial command failed
0x6D	TSBERR109	SCSI Inquiry command failed
0x6E	TSBERR110	SCSI Report Supported Operation Code command failed
0x6F	TSBERR111	SCSI Read Buffer command failed
0x70	TSBERR112	SCSI Write Buffer command failed
0x71	TSBERR113	SCSI Mode Sense command failed
0x72	TSBERR114	SCSI Log Sense command failed
0x73	TSBERR115	SCSI Mode Select command failed
0x74	TSBERR116	SCSI Log Select command failed
0x75	TSBERR117	Deferred download failed with current firmware image
0x76	TSBERR118	Changing feature value is not supported in tool

0x77	TSBERR119	SCSI Sanitize Device command failed
0x78	TSBERR120	SCSI Read Capacity command failed
0x79	TSBERR121	SCSI Request Sense command failed
0x7A	TSBERR122	Sense Data doesn't match the expected value
0x7B	TSBERR123	SCSI Send Diagnostic command failed
0x7C	TSBERR124	Self-test is already running on device
0x7D	TSBERR125	Self-test is not running on device
0x7E	TSBERR126	Requested Self-test is not supported
0x7F	TSBERR127	Invalid field in received Mode Sense buffer
0x80	TSBERR128	SMART feature is not enabled on device
0x81	TSBERR129	CDB length mismatch
0x82	TSBERR130	Application aborted due to abort signal
0x83	TSBERR131	Abort signal request cancelled by user
0x84	TSBERR132	Application can not abort during critical operations
0x85	TSBERR133	Data mismatch detected for LBA
0x86	TSBERR134	SCSI read defect data command failed
0x87	TSBERR135	Device read command failed
0x88	TSBERR136	Device Write command failed
0x89	TSBERR137	Device LBA verify command failed
0x8A	TSBERR138	SCSI Test unit ready command failed
0x8B	TSBERR139	SCSI Start stop unit command failed
0x8C	TSBERR140	ATA Standby immediate command failed
0x8D	TSBERR141	ATA Idle immediate command failed
0x8E	TSBERR142	ATA Check power mode command failed
0x8F	TSBERR143	Format unit command failed
0xA0	TSBERR160	LBA range is too small
0xA1	TSBERR161	ATA Flush cache command failed
0xA2	TSBERR162	SCSI Synchronize cache command failed
0xA3	TSBERR163	ATA Security Disable Password failed
0xA4	TSBERR164	ATA Security Unlock command failed
0xA5	TSBERR165	ATA Set accessible max address command failed
0xA6	TSBERR166	Device operation is exclusively locked by other command
0xA7	TSBERR167	Format operation is active on device
0xA8	TSBERR168	Format operation is not active on device
0xA9	TSBERR169	Invalid binary file
0xAB	TSBERR171	ATA Trusted send command failed
0xAC	TSBERR172	ATA Trusted receive command failed
0xAD	TSBERR173	SCSI Security protocol out command failed
0xAE	TSBERR174	SCSI Security protocol in command failed
0xAF	TSBERR175	SCSI Read internal log command failed
0xB1	TSBERR177	TCG start session failed
0xB2	TSBERR178	TCG end session failed
0xB4	TSBERR180	Invalid IO block size
0xB5	TSBERR181	SMART-trip failure detected on device
0xB6	TSBERR182	Changing mode parameter value not allowed

0xB7	TSBERR183	Exceeded retries to get the expected response
0xB8	TSBERR184	Device has active partition(s)
0xB9	TSBERR185	Changing feature value is not supported in OS
0xBA	TSBERR186	TCG command failed
0xBB	TSBERR187	TCG TPer Propert read operation failed
0xBC	TSBERR188	TCG read data store table operation failed
0xBD	TSBERR189	TCG read MSID_PIN operation failed
0xBE	TSBERR190	TCG set SID Password operation failed
0xBF	TSBERR191	ATA Sanitize operation failed
0xC0	TSBERR192	Firmware image has overlapping ranges
0xC1	TSBERR193	Failed decoding internal log
0xC2	TSBERR194	TCG Locking SP not active on device
0xC5	TSBERR197	SMART error threshold value exceeded
0xC6	TSBERR198	Invalid combination of parameters
0xC7	TSBERR199	SMART return status failed
0xC8	TSBERR200	Command restricted on device
0xC9	TSBERR201	Requested log page not available
0xCA	TSBERR202	Maximum number of drives limit exceeded
0xCB	TSBERR203	Command execution timed out
0xCC	TSBERR204	Sector size update failed
0xCD	TSBERR205	ATA Get native max address ext command failed
0xCE	TSBERR206	Self-test command failed
0xCF	TSBERR207	Unsupported Model
0xD0	TSBERR208	Firmware version mismatch
0xD1	TSBERR209	Target CHS not found on device
0xD2	TSBERR210	IOCTL Error occurred for command
0xD3	TSBERR211	Unsupported OS
0xD4	TSBERR212	File limit exceeded

7.1.2 Action code

Result	Explicit code
PASS – NOP required	0
PASS – Reboot required	1
PASS – Power down required	2
PASS – Power cycle required	3
PASS – Full power down required	4
PASS – Full power cycle required	5

7.1.3 Success return code

In case of success, tool will always return 0 return code other than firmware download command.

For firmware download command return code on success see section 7.2.1.

7.1.4 Failure return code

Complete returned code is displayed on console and logged in the log file in following format for commands other than firmware download.

Command return code: 0x8000 ## 00

Where ## is command status code.

Note Only command status code byte is returned to the console as command execution status (including firmware download command). For firmware download command return code on failure see section 7.2.2.

7.2 Explicit Return Codes for firmware download command

7.2.1 Success status

In case of firmware download success, only action code field is returned.

- Failure status bit is reset to 0
- Command status field is reset to 0
- Action code is set (see section 7.1.2 for details)

Result	Explicit code
PASS – NOP required (Not practical)	0x00000000
PASS – Reboot required	0x00000001
PASS – Power down required	0x00000002
PASS – Power cycle required	0x00000003
PASS – Full power down required	0x00000004
PASS – Full power cycle required	0x00000005

7.2.2 Failure status

In case of firmware download failure

- Failure status bit is set to 1
- Command status field is set (see section 7.1.1 for details)
- Action code is set (see section 7.1.2 for details)

Result	Explicit code
FAILED – NOP required (Not practical)	0x8000##00
FAILED – Reboot required	0x8000##01
FAILED – Power down required	0x8000##02
FAILED – Power cycle required	0x8000##03
FAILED – Full power down required	0x8000##04
FAILED – Full power cycle required	0x8000##05

7.2.3 In download status

In case firmware download is incomplete then error code will be as follows

- Failure status bit is reset to 0
- Bit 30 is set to 1 to indicate the incomplete status
- Command status field is set (see section 7.1.1 for details)
- Action code is set (see section 7.1.2 for details)

Result	Explicit code
INCOMPLETE – NOP required	0x4000##00
INCOMPLETE – Reboot required	0x4000##01
INCOMPLETE – Power down required	0x4000##02
INCOMPLETE – Power cycle required	0x4000##03
INCOMPLETE – Full power down required	0x4000##04
INCOMPLETE – Full power cycle required	0x4000##05

APPENDIX-A

In case of error condition(s), device may go in an inconsistent state.

This section describes the methods to recover/reset the devices.

Windows

Follow the below steps to refresh/reset the device on windows:

1. Open Control Panel->Device Manager
2. Expand Disk drives
3. Search for your drive in drive list
4. Right click on the drive
5. From context menu, select option "Disable"
6. Wait for Device Manager console to reload
7. Right click on the disable drive again
8. From context menu, select option "Enable"

Your drive will be usable here.

Linux

The error recovery code within the Linux kernel when faced with a SCSI command timing out and no response from the device (LU), first tries a device reset and if that is not successful tries a target reset. If that is not successful it tries a bus reset. If that is not successful it tries a host reset.

So on Linux, any device error should be automatically recovered in some time (1-5 min).

However, if device doesn't recover automatically then various Linux tools/utilities can be used to reset the device.

Method 1 – Rescan all devices on specific SCSI bus

Find host bus number

```
grep mpt /sys/class/scsi_host/host?/proc_name
```

This should return a line like below

```
/sys/class/scsi_host/host0/proc_name:mptspi
```

Reported host0 (or host1 etc.) can be used to rescan the bus

```
echo "- - -" > /sys/class/scsi_host/host0/scan
```

Method 2 – Rescan specific SCSI device

If SCSI host number (h), bus number (c), target id (t) and LUN number (l) are known then the device can be rescanned with the following command:

```
echo 1 > /sys/class/scsi_device/<h>:<c>:<t>:<l>/rescan
```


Method 3 – Using external utility sg_reset

External utility sg_reset can be used to reset the device as

sg_reset -b <device ID>

sg_reset –d <device ID>

Example:

sg_reset –b /dev/sdc OR sg_reset –d /dev/sdc

Please refer sg_reset man page for details of the command.

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