

SCSI CLI for ASPI

Command line interface specification

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1. Introduction

1.1. General command line format

All executable modules are console applications with command line interface.

The general format of the command line is the following:

```
[Path\]ScsiAspiXxx [Options] [Command]
```

Where

Path is either full or relative path to the folder where the module is located.

ScsiAspiXxx is the name of the utility.

Options are zero or more command line options. The format of the command line options is described in the section 1.2. "Command line options". The names and the values of the supported command line options depend on the module invoked.

Command is the optional command if the module accepts the command. The set of the supported commands depends on the module invoked.

1.2. Command line options

The command line option has the following format:

```
-<Option name>[ {<Numerical value>|<Text value>}]
```

Where

Option name is the case insensitive option name. The option name may include one or more characters. The dash ('-') character should precede the option name. If the option has numerical or text value the value should be separated from the option name by the space character. If the option does not have a value it is a Boolean option. If such the option is present in the command line the True value is assumed. Otherwise the False is assumed as a Boolean option value.

Numerical value is the decimal value of the numerical option.

Text value is the text value of the text option. If the text itself includes space character or other white space characters the text string should be enclosed in double quotes.

If the option includes the value of either type the name and the value should be separated by the space character.

The following options should be supported by all modules.

-h

If this option is present in the command line the module should print the help text and should exit without execution of any command.

The following options should be supported by all modules that execute the SCSI commands.

-a N

Determines the host bus adapter number. The N is zero-based host bus adapter number.

-t N

Determines the target SCSI ID of the SCSI device. The N is the target SCSI ID value.

-l N

Determines the logical unit number (LUN) of the SCSI device. The N is LUN value.

-ua

If this option is specified the utility pumps all pending Unit Attentions out and repeats the command until it is executed successfully or with real error. If the option is not specified and Unit Attention is pending the command fails and Unit Attention parameters are printed as error information.

1.3. Return code

Each executable module returns the integer code when it finishes. The return code is a sign of whether the module did its task successfully or certain error occurred during the execution.

The following values are defined for the return code.

Value	Description
0	Successful completion.
1	Generic failure (unhandled internal error).
2	Wrong command line option specified.
3	Invalid value for the numerical or text command line option specified.
4	Failed to load the ASPI library.
5	The SCSI command was completed with the bus error.
6	The SCSI command was completed with the SCSI error.
7	The SCSI command was completed with the Unit Attention.
8	Insufficient system resources.
9	Failed file I/O while reading/writing the data from/to the file on hard disk.
10	Timeout expired.

1.4. Screen output

When the SCSI ASPI utility is started it prints on the screen the version string first. The version string includes the utility name and the version numbers.

Then the utility optionally prints the SCSI command name and its parameters.

The content of further output depends on whether the command was completed successfully or with the error and on whether the utility parses the received data.

- Successful completion. If the utility parses the received data the data fields are printed on the screen. The format of the output depends on the data type and is described in more details for each such utility. Then the utility prints the message about the successful completion of the command.
- Completion with the bus error. The utility prints the failure message with the adapter (SRB) status value.

- Completion with the SCSI error. The utility prints the failure message with the SCSI status value. If the SCSI status value is CHECK CONDITION (2) all the fields of the sense data are also printed. Each field is printed in the separate line in the format “<field name>: <decimal field value>”.
- Completion with the Unit Attention condition. The utility prints the message about the detection of the Unit Attention. Then the sense data are printed exactly as for the case of SCSI error.

If the help (-h) option is specified the utility prints the help text instead of executing the SCSI command or other action.

2. Executable modules

2.1. ScsiAspiEnum

The ScsiAspiEnum utility enumerates all SCSI devices that are connected to the PC and prints on the screen the following parameters:

- Adapter number
- Target SCSI ID
- Logical unit number (LUN)
- Device type.

The utility does not support any command line parameters.

When “short module names” option is enabled during the installation process the executable module is installed with the name Enum.exe. Otherwise the executable module is installed with the name ScsiAspiEnum.exe.

2.2. ScsiAspiErase6

The ScsiAspiErase6 utility executes the Erase (6) (19h) SCSI command.

In addition to common command line options the utility supports the following command line options.

-i

If this option is specified, the Immediate (IMMED) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-o

If this option is specified, the Long (LONG) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-m <Method>

Specifies the value of the METHOD field of CDB. If the option is not specified the corresponding CDB field will have zero value.

-s

If this option is specified, the Security Metadata (SMD) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-v

If this option is specified, the Vendor-Specific Control Metadata (VCM) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

When “short module names” option is enabled during the installation process the executable module is installed with the name Erase6.exe. Otherwise the executable module is installed with the name ScsiAspiErase6.exe.

2.3. ScsiAspiInfo

The ScsiAspiInfo utility prints on the screen the following information:

- Version information for SCSI ASPI package.
- Registration number for full function package. For the demo and trial package the registration number is shown as “N/A” string.
- Version information for ASPI modules.

When “short module names” option is enabled during the installation process the executable module is installed with the name Info.exe. Otherwise the executable module is installed with the name ScsiAspiInfo.exe.

2.4. ScsiAspiInquiry

The ScsiAspiInquiry utility executes the Inquiry (12h) SCSI command. If the device returns valid inquiry data the utility parses the following known data pages.

- Standard Inquiry Data
- Supported VPD Pages (00h)
- Unit Serial Number (80h)
- Device Identification (83h)

In addition to common command line options the utility supports the following command line options.

-d <Allocation length>

Specifies the value of the ALLOCATION LENGTH CDB field. The <Allocation length> is the decimal value that should be in the range from 0 to 65535. If this option is not specified the value 0 will be used as allocation length.

-e

If this is specified, the Enable Vital Product Data (EVPD) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-p <Page code>

Specifies the value of the PAGE CODE CDB field. The <Page code> is the decimal value that should be in the range from 0 to 255. If this option is not specified the value 0 will be used as page code.

When “short module names” option is enabled during the installation process the executable module is installed with the name Inquiry.exe. Otherwise the executable module is installed with the name ScsiAspilnquiry.exe.

2.5. ScsiAspilnitElementStatus

The ScsiAspilnitElementStatus utility executes the Initialize Element Status (07h) SCSI command.

The utility supports common command line options.

When “short module names” option is enabled during the installation process the executable module is installed with the name InitElem.exe. Otherwise the executable module is installed with the name ScsiAspilnitElementStatus.exe.

2.6. ScsiAspilnitElementStatusRange

The ScsiAspilnitElementStatusRange utility executes the Initialize Element Status With Range (37h) SCSI command.

In addition to common command line options the utility supports the following command line options.

-f

If this option is specified, the FAST field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-n <number of elements>

Specifies the value of the NUMBER OF ELEMENTS CDB field. The <number of elements> is the decimal value that should be in the range from 0 to 65536. If this option is not specified the value 0 will be used as number of elements.

-o

If this option is specified, the E7h operation code will be used in CDB. If the option is not specified the 37h operation code will be used in CDB.

-r

If this option is specified, the RANGE field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-s <starting element address>

Specifies the value of the STARTING ELEMENT ADDRESS CDB field. The <starting element address> is the decimal value that should be in the range from 0 to 65536. If this option is not specified the value 0 will be used as starting element address.

When “short module names” option is enabled during the installation process the executable module is installed with the name InitRang.exe. Otherwise the executable module is installed with the name ScsiAspilnitElementStatusRange.exe.

2.7. ScsiAspiLoadUnload

The ScsiAspiLoadUnload utility executes the Load Unload (1Bh) SCSI command.

In addition to common command line options the utility supports the following command line options.

-i

If this option is specified, the Immediate (IMMED) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-d

If this option is specified, the Hold (HOLD) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-e

If this option is specified, the End-Of-Tape (EOT) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-r

If this option is specified, the Retention (RETEN) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-o

If this option is specified, the Load (LOAD) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

When “short module names” option is enabled during the installation process the executable module is installed with the name LoadUnld.exe. Otherwise the executable module is installed with the name ScsiAspiLoadUnload.exe.

2.8. ScsiAspiLocate10

The ScsiAspiLocate10 utility executes the Locate (10) (2Bh) SCSI command.

In addition to common command line options the utility supports the following command line options.

-b

If this is specified, the Block Identifier Type (BT) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-c

If this is specified, the Change Partition (CP) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-i

If this is specified, the Immediate (IMMED) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-o <Logical Object Identifier>

Specifies the value of the LOGICAL OBJECT IDENTIFIER CDB field. The <Logical Object Identifier> is the decimal value that should be in the range from 0 to 4294967295. If this option is not specified the value 0 will be used as logical object identifier.

-p <Partition>

Specifies the value of the PARTITION CDB field. The <Partition> is the decimal value that should be in the range from 0 to 255. If this option is not specified the value 0 will be used as partition number.

When “short module names” option is enabled during the installation process the executable module is installed with the name Locate10.exe. Otherwise the executable module is installed with the name ScsiAspiLocate10.exe.

2.9. ScsiAspiMoveMedium

The ScsiAspiMoveMedium utility executes the Move Medium (A5h) or Move Medium Attached (A7h) SCSI command.

In addition to common command line options the utility supports the following command line options.

-attached

If this option is specified, the Move Medium Attached (A7h) SCSI command will be executed. If the option is not specified the Move Medium (A5h) SCSI command will be executed.

-d <address>

Specifies the value of the DESTINATION ADDRESS CDB field. The <address> is the decimal value that should be in the range from 0 to 65536. If this option is not specified the value 0 will be used as destination element address.

-i

If this option is specified, the INVERT field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-m <address>

Specifies the value of the MEDIUM TRANSPORT ADDRESS CDB field. The <address> is the decimal value that should be in the range from 0 to 65536. If this option is not specified the value 0 will be used as medium transport element address.

-s <address>

Specifies the value of the SOURCE ADDRESS CDB field. The <address> is the decimal value that should be in the range from 0 to 65536. If this option is not specified the value 0 will be used as source element address.

When “short module names” option is enabled during the installation process the executable module is installed with the name MvMedium.exe. Otherwise the executable module is installed with the name ScsiAspiMoveMedium.exe.

2.10. ScsiAspiReadBuffer

The ScsiAspiReadBuffer utility executes the Read Buffer (3Ch) SCSI command.

The read data are either printed on the screen or saved to the binary file. If the data are saved to the file the binary data structure remains unchanged. If the data are printed on the screen they are printed as the binary dump. Each dump line starts with the relative dump address in the hexadecimal notation. The address field is delimited by the colon (':') character. Then the 16 bytes are printed in the hexadecimal notation. The value of each byte is delimited by the space character.

In addition to common command line options the utility supports the following command line options.

-d <Allocation length>

Specifies the value of the ALOCATION LENGTH CDB field. The <Allocation length> is the decimal value that should be in the range from 0 to 16777215. If this option is not specified the value 0 will be used as allocation length.

-f <Data file>

Specifies the full path to the data file the read binary data should be saved to. If the file path includes spaces the whole path string should be enclosed into the double quotes. If this option is not specified the data will printed on the screen as a binary dump.

-i <Buffer ID>

Specifies the value of the BUFFER ID CDB field. The <Buffer ID> is the decimal value that should be in the range from 0 to 255. If this option is not specified the value 0 will be used as buffer ID.

-m <Mode>

Specifies the value of the MODE CDB field. The <Mode> is the decimal value that should be in the range from 0 to 31. If this option is not specified the value 0 will be used as buffer mode.

-o <Buffer offset>

Specifies the value of the BUFFER OFFSET CDB field. The <Buffer offset> is the decimal value that should be in the range from 0 to 16777215. If this option is not specified the value 0 will be used as buffer offset.

When “short module names” option is enabled during the installation process the executable module is installed with the name ReadBuff.exe. Otherwise the executable module is installed with the name ScsiAspiReadBuffer.exe.

2.11. ScsiAspiReadElementStatus

The ScsiAspiMoveMedium utility executes the Read Element Status (B8h) or Read Element Status Attached (B4h) SCSI command.

In addition to common command line options the utility supports the following command line options.

-attached

If this option is specified, the Read Element Status Attached (B4h) SCSI command will be executed. If the option is not specified the Read Element Status (B8h) SCSI command will be executed.

-c

If this option is specified, the Current Data (CURDATA) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-d <Allocation length>

Specifies the value of the ALOCATION LENGTH CDB field. The <Allocation length> is the decimal value that should be in the range from 0 to 16777215. If this option is not specified the value 0 will be used as allocation length. If -x option is specified this option is ignored.

-e <type>

Specifies the value of the ELEMENT TYPE CODE CDB field. The <type> is the decimal value that should be in the range from 0 to 15. If this option is not specified the value 0 will be used as element type code.

-i

If this option is specified, the Device ID (DVCID) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-n <number of elements>

Specifies the value of the NUMBER OF ELEMENTS CDB field. The <number of elements> is the decimal value that should be in the range from 0 to 65536. If this option is not specified the value 0 will be used as number of elements.

-s <address>

Specifies the value of the STARTING ELEMENT ADDRESS CDB field. The <address> is the decimal value that should be in the range from 0 to 65536. If this option is not specified the value 0 will be used as starting element address.

-v

If this option is specified, the Volume Tag (VOLTAG) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

-x

If this option is specified, the utility will ignore the -d option and will execute several SCSI commands with the optimal value of ALOCATION LENGTH CDB field based on the Maximum Transfer Length HBA characteristics until the status data for all requested elements are received.

If command was executed successfully the utility parses received element status data and prints the values of element descriptor fields. The fields of one element descriptor are printed in one text row and are separated by Tabulation (09h) character. The fields are printed in the following sequence:

- Element address
- Element type
- Access
- Except
- Full
- Additional Sense Code
- Additional Sense Code Qualifier
- Primary Volume Identifier
- Primary Volume Identifier Qualifier
- Primary Volume Sequence Number
- Alternate Volume Identifier
- Alternate Volume Identifier Qualifier
- Alternate Volume Sequence Number
- Source Valid
- Source Storage Element Address
- Invert
- Element Disabled
- Medium Type

Numerical values of element descriptor fields are printed in decimal format.

When “short module names” option is enabled during the installation process the executable module is installed with the name ReadStat.exe. Otherwise the executable module is installed with the name ScsiAspiReadElementStatus.exe.

2.12. ScsiAspiReportLuns

The ScsiAspiReportLuns utility executes the Report LUNs (A0h) SCSI command. If the device returns valid data the utility parses the data and logs LUN parameters.

In addition to common command line options the utility supports the following command line options.

-d <Allocation length>

Specifies the value of the ALOCATION LENGTH CDB field. The <Allocation length> is the decimal value that should be in the range from 0 to 2147483647. If this option is not specified the value 0 will be used as allocation length.

-r <Select report>

Specifies the value of the SELECT REPORT CDB field. The < Select report > is the decimal value that should be in the range from 0 to 255. If this option is not specified the value 0 will be used as report selection.

When “short module names” option is enabled during the installation process the executable module is installed with the name RepLuns.exe. Otherwise the executable module is installed with the name ScsiAspiReportLuns.exe.

2.13. ScsiAspiRequestSense

The ScsiAspiRequestSense utility executes the Request Sense (03h) SCSI command. If the device returns valid sense data the utility parses the fixed format sense data.

In addition to common command line options the utility supports the following command line options.

-d <Allocation length>

Specifies the value of the ALOCATION LENGTH CDB field. The <Allocation length> is the decimal value that should be in the range from 0 to 255. If this option is not specified the value 0 will be used as allocation length.

-s

If this option is specified, the Descriptor Format (DESC) field in CDB will have non-zero value. If the option is not specified the corresponding field in CDB will have zero value.

When “short module names” option is enabled during the installation process the executable module is installed with the name ReqSense.exe. Otherwise the executable module is installed with the name ScsiAspiRequestSense.exe.

2.14. ScsiAspiRescan

The ScsiAspiRescan utility rescans SCSI buses for all host bus adapters that are installed on the PC and are handled by ASPI subsystem. As a result of successful rescanning the internal device list is updated inside the ASPI subsystem.

When “short module names” option is enabled during the installation process the executable module is installed with the name Rescan.exe. Otherwise the executable module is installed with the name ScsiAspiRescan.exe.

2.15. ScsiAspiRewind

The ScsiAspiRewind utility executes the Rewind (01h) SCSI command.

In addition to common command line options the utility supports the following command line options.

-i

If this is specified, the Immediate (IMMED) field in CDB will have non-zero value. If the option is not specified the corresponding CDB field will have zero value.

When “short module names” option is enabled during the installation process the executable module is installed with the name Rewind.exe. Otherwise the executable module is installed with the name ScsiAspiRewind.exe.

2.16. ScsiAspiSpace6

The ScsiAspiSpace6 utility executes the Space (6) (11h) SCSI command.

In addition to common command line options the utility supports the following command line options.

-c <Code>

Specifies the value of the CODE CDB field. The <Code> is the decimal value that should be in the range from 0 to 15. If this option is not specified the value 0 will be used.

-o <Count>

Specifies the value of the COUNT CDB field. The <Count> is the decimal value that should be in the range from -8388608 to 8388607 (3-byte signed integer value). If this option is not specified the value 0 will be used.

When “short module names” option is enabled during the installation process the executable module is installed with the name Space6.exe. Otherwise the executable module is installed with the name ScsiAspiSpace6.exe.

2.17. ScsiAspiTapeRead6

The ScsiAspiTapeRead6 utility executes the tape drive version of Read (6) (08h) SCSI command. The SCSI command is being executed one time or repeatedly depending on command line option.

The read data are either printed on the screen or saved to the binary file. If the data are saved to the file the binary data structure remains unchanged. If the data are printed on the screen they are printed as the binary dump. Each dump line starts with the relative dump address in the hexadecimal notation. The address field is delimited by the colon (':') character. Then the 16 bytes are printed in the hexadecimal notation. The value of each byte is delimited by the space character.

In addition to common command line options the utility supports the following command line options.

-b <Fixed block length>

Specifies the length of fixed-length blocks in bytes. This option must be present if `-x` option is specified.

`-f <Data file>`

Specifies the full path to the data file the read binary data should be saved to. If the file path includes spaces the whole path string should be enclosed into the double quotes. If this option is not specified the data will be printed on the screen as a binary dump.

`-r <Transfer length>`

Specifies the value of the TRANSFER LENGTH CDB field.

`-s <Total data size>`

If this option is specified and it has non-zero value it determines the total size in bytes of the data that will be read from the tape. In this case the Read (6) SCSI command will be executed multiple times. If this option is not specified or it has zero value the Read (6) command will be executed one time.

`-x`

If this option is specified, the FIXED field in CDB will have non-zero value. If the option is not specified the FIXED field in CDB will have zero value.

`-y`

If this option is specified, the SILI field in CDB will have non-zero value. If the option is not specified the SILI field in CDB will have zero value.

When “short module names” option is enabled during the installation process the executable module is installed with the name `TapeRd6.exe`. Otherwise the executable module is installed with the name `ScsiAspiTapeRead6.exe`.

2.18. ScsiAspiTapeWrite6

The `ScsiAspiTapeWrite6` utility executes the tape drive version of Write (6) (0Ah) SCSI command. The SCSI command is being executed one time or repeatedly depending on command line option. The data can be either taken from the file or generated in the memory on the fly.

In addition to common command line options the utility supports the following command line options.

`-b <Fixed block length>`

Specifies the length of fixed-length blocks in bytes. This option must be present if `-x` option is specified.

-f <Data file>

Specifies the full path to the file with the data that should be sent to the device. If the file path includes spaces the whole path string should be enclosed into the double quotes. If this option is specified the data from the file will be sent to the device. Otherwise the data will be generated on the fly.

-fa

If this option is specified the file size will be used as a total data size. This option is mutually exclusive with the `-s` option.

-r <Transfer length>

Specifies the value of the TRANSFER LENGTH CDB field.

-s <Total data size>

If this option is specified and it has non-zero value it determines the total size in bytes of the data that will be written to the tape. In this case the Write (6) SCSI command will be executed multiple times. If this option is not specified or it has zero value the Write (6) command will be executed one time. This option is mutually exclusive with the `-fa` option.

-vo

If this option is specified the additional trace information will be printed on the screen. The following information will be printed.

- The values of all CDB fields (FIXED and TRANSFER LENGTH)
- The actual size of the data to write.
- The offset in the data file if the data file is specified.
- Final message when all the data have been written to the device.

-x

If this option is specified, the FIXED field in CDB will have non-zero value. If the option is not specified the FIXED field in CDB will have zero value.

-y <Data type>

Specifies the type of the data that will be generated. The data type can have the following values.

- 0 Zero-filled data.
- 1 Random data.

If this option is not specified zero-filled data will be generated.

When “short module names” option is enabled during the installation process the executable module is installed with the name TapeWrt6.exe. Otherwise the executable module is installed with the name ScsiAspiTapeWrite6.exe.

2.19. ScsiAspiTestUnitReady

The ScsiAspiTestUnitReady utility executes the Test Unit Ready (00h) SCSI command.

In addition to common command line options the utility supports the following command line options.

-w

If this option is specified, the utility periodically (every second) executes the Test Unit Ready (00h) command until the device becomes ready or the wait timeout expires. If the option is not specified the utility executes single Test Unit Ready (00h) command and prints the command execution results out.

When “short module names” option is enabled during the installation process the executable module is installed with the name TstReady.exe. Otherwise the executable module is installed with the name ScsiAspiTestUnitReady.exe.