

**NAME**

`sg_opcodes` – report supported SCSI commands or task management functions

**SYNOPSIS**

**sg\_opcodes** [*--alpha*] [*--compact*] [*--enumerate*] [*--help*] [*--hex*] [*--mask*] [*--mlu*] [*--no-inquiry*] [*--opcode=OP*] [*--pdt=DT*] [*--raw*] [*--rctd*] [*--repd*] [*--sa=SA*] [*--tmf*] [*--unsorted*] [*--verbose*] [*--version*] *DEVICE*

**sg\_opcodes** [*-a*] [*-c*] [*-e*] [*-H*] [*-m*] [*-M*] [*-n*] [*-o=OP*] [*-p=DT*] [*-q*] [*-R*] [*-s=SA*] [*-t*] [*-u*] [*-v*] [*-V*] [*-?*] *DEVICE*

**DESCRIPTION**

This utility sends a SCSI REPORT SUPPORTED OPERATION CODES or a REPORT SUPPORTED TASK MANAGEMENT FUNCTIONS command to the *DEVICE* and then outputs the response. The default action is to report supported operation codes. In this mode it will either list all supported commands or give detailed information on a specific command identified by the *--opcode=OP* option (perhaps with additional information from the *--sa=SA* option).

The name of a SCSI command depends on its peripheral device type (e.g. a disk). The REPORT SUPPORTED OPERATION CODES and REPORT SUPPORTED TASK MANAGEMENT FUNCTIONS commands are not supported in the MMC command set for CD and DVD devices. This utility does an INQUIRY to obtain the peripheral device type and prints out the vendor, product and revision strings.

A similar facility to query supported operation codes previously was available via the CmdDt bit in the SCSI INQUIRY command (see `sg_inq(8)`). However that facility was made obsolete and replaced by the REPORT SUPPORTED OPERATION CODES command in SPC-3 (revision 4) during February 2002.

This utility supports two command line syntaxes, the preferred one is shown first in the synopsis and explained in this section. A later section on the old command line syntax outlines the second group of options.

**OPTIONS**

Arguments to long options are mandatory for short options as well.

**-a, --alpha**

when all supported commands are being listed there is no requirement for the device server (i.e. the *DEVICE*) to sort the list of commands. When this option is given the list of supported commands is sorted by name (alphabetically). When this option and the **--unsorted** option are both `_not_` given then the list of supported commands is sorted numerically (first by operation code and then by service action).

**-c, --compact**

some command names, especially those associated with some service actions, are getting longer. This may cause line wrap in the one line per command mode on some terminals. When this option is given the opcode and service action fields are combined into a single field with the service action, prefixed by a comma shown directly after the opcode. If there is no service action associated with the command, then the comma and the service action are not shown after the opcode. The CDB size field is not shown when this option is given.

**-e, --enumerate**

this option prints the name of the SCSI command based on the given opcode, peripheral device type and optionally the service action. If given, *DEVICE* is ignored. The opcode, peripheral device type and service action default to zero if not given. Thus if this option is the only option given then "Test Unit ready" is output since its opcode is 0, it has no service action and it is common to all peripheral device types since it is defined in the SCSI Primary Commands (SPC) standard(s).

**-h, --help**

outputs the usage message summarizing command line options then exits. Ignores *DEVICE* if given.

**-H, --hex**

outputs the response in ASCII hexadecimal to stdout.

**-m, --mask**

additionally prints out the cdb mask in hex. So a 12 byte cdb will have a 12 byte hexadecimal mask. If the hexadecimal is expanded (mentally) to binary then a "1" means the corresponding position in the cdb may be set. And "0" means the corresponding position in the cdb must not be set. For "0" mask positions that a user tries to set in a cdb, the device may either ignore it or report an error, typically with a sense key of "illegal request".

**-M, --mlu**

additionally prints out an indication (0 or 1) whether the command effects all logical units in the containing target. MLU (Multiple Logical Units) is a bit in the REPORT SUPPORTED OPERATION CODES response introduced by proposal 18-045r1 (and possibly in spe5r20). Without the option, the default output format which lists all opcodes, does not include a MLU indication.

**-n, --no-inquiry**

Prior to calling a SCSI REPORT SUPPORTED OPERATION CODES or a REPORT SUPPORTED TASK MANAGEMENT FUNCTIONS command, a SCSI INQUIRY command is performed. The reason is to determine the peripheral device type (pdt) of the *DEVICE* as this is helpful in translating operation codes to the command names. By default this utility prints a summary of INQUIRY command response on stdout. If this option (or the `--raw` option) is given then that summary is not printed on stdout.

**-O, --old**

Switch to older style options. Please use as first option.

**-o, --opcode=OP**

the *DEVICE* will be queried for the given operation code (i.e. the *OP* value) which is the first byte of a SCSI command. *OP* is decimal unless prefixed by "0x" or it has a trailing "h". *OP* should be in the range 0 to 255 (0xff) inclusive. When this option is not given then all available SCSI commands supported by the *DEVICE* are listed.

**-p, --pdt=DT**

where *DT* is the peripheral device type. This is used together with the `--enumerate` to differentiate when a command opcode (and perhaps service action) is shared by multiple device types. This option may also be used with the `--no-inquiry` option to suppress this utility doing an INQUIRY command since the main reason for doing that is to find the peripheral device type of the *DEVICE*.

**-r, --raw**

output the response in binary to stdout. Error messages and warnings, if any, are sent to stderr.

**-R, --rctd**

set report command timeout descriptor (RCTD) bit in the cdb. The response may or may not contain command timeout descriptors. If available they are output. If supported there are two values: a nominal command timeout and a recommended command timeout. Both have units of seconds. A value of zero means that no timeout is indicated and this is shown in the corresponding decoded output as "-".

**-q, --repd**

set read extended parameter data (REPD) bit in the report task management functions cdb. 16 bytes rather than the default 4 bytes expected in the response. This was added in SPC-4 (revision 26).

**-s, --sa=SA**

the *DEVICE* will be queried for a command with the given service action (i.e. the *SA* value). Used in conjunction with the `--opcode=OP` option. If this option is not given, `--opcode=OP` is given and the command in question does have a service action then a value of 0 will be assumed. *SA* is decimal and expected to be in the range 0 to 65535 (0xffff) inclusive.

- t, --tmf**  
list supported task management functions. This is done with the SCSI REPORT SUPPORTED TASK MANAGEMENT FUNCTIONS command. When this option is chosen the *--alpha*, *--opcode=OP*, *--rctd*, *--sa=SA* and *--unsorted* options are ignored.
- u, --unsorted**  
when all supported commands are being listed there is no requirement for the device server (i.e. the *DEVICE*) to sort the list of commands. When this option is given the list of supported commands is in the order given by the *DEVICE*. When this option is not given the supported commands are sorted numerically (first by operation code and then by service action).
- v, --verbose**  
increase level of verbosity. Can be used multiple times.
- V, --version**  
print out version string then exit.

## NOTES

As of SPC-5 revision 8 the recognized task management functions are: abort set, abort task set, clear ACA, clear task set, logical unit reset, query task, query asynchronous event, query task set, and I\_T nexus reset. In SPC-4 revision 26 target reset and wakeup task management functions were made obsolete.

In the 2.4 series of Linux kernels the *DEVICE* must be a SCSI generic (sg) device. In the 2.6 series block devices (e.g. SCSI disks and DVD drives) can also be specified. For example "sg\_opcodes /dev/sda" will work in the 2.6 series kernels.

## EXIT STATUS

The exit status of *sg\_opcodes* is 0 when it is successful. Otherwise see the *sg3\_utils(8)* man page.

## OLDER COMMAND LINE OPTIONS

The options in this section were the only ones available prior to *sg3\_utils* version 1.23 . Since then this utility defaults to the newer command line options which can be overridden by using *--old* (or *-O*) as the first option. See the ENVIRONMENT VARIABLES section for another way to force the use of these older command line options.

- a** sort command alphabetically. Equivalent to *--alpha* in main description.
- c** see the *--compact* option above.
- e** see the *--enumerate* option above.
- H** see the *--hex* option above.
- m** see the *--mask* option above.
- n** don't print a summary of the SCSI INQUIRY response on stdout.
- N, --new**  
Switch to the newer style options.
- o=OP** the *DEVICE* will be queried for the given operation code (i.e. *OP*) which is the first byte of a SCSI command. *OP* is hexadecimal and expected to be in the range 0 to ff inclusive. When this option is not given then all available SCSI commands supported by the *DEVICE* are listed.
- p=DT** see the *--pdt=DT* option above.
- q** set the read extended parameter data (REPD) bit in report TMF cdb. Equivalent to *--repd* in main description.
- R** set the report command timeout descriptor (RCTD) bit in cdb. Equivalent to *--rctd* in main description.
- s=SA** the *DEVICE* will be queried for a command with the given service action (i.e. *SA*). Used in conjunction with the *-o=OP* option. If this option is not given, *-o=OP* is given and the command in question does have a service action then a value of 0 will be assumed. *SA* is hexadecimal and expected to be in the range 0 to ffff inclusive.

- t** list supported task management functions. Equivalent to `--tmf` in the main description.
- u** output all supported commands in the order given by *DEVICE*. Equivalent to `--unsorted` in main description.
- v** increase level of verbosity. Can be used multiple times.
- V** print out version string then exit.
- ?** output usage message. Ignore all other parameters.

## EXAMPLES

The examples in this page use Linux device names. For suitable device names in other supported Operating Systems see the `sg3_utils(8)` man page.

To see the information about a specific command give its operation code to the `'--op='` option. A command line invocation is shown first followed by a typical response:

```
# sg_opcodes --op=93h /dev/sdb
Opcode=0x93
Command_name: Write same(16)
Command supported [conforming to SCSI standard]
Usage data: 93 e2 00 00 00 00 ff ff ff ff 00 00 ff ff 00 00
```

The next example shows the supported task management functions:

```
# sg_opcodes --tmf -n /dev/sdb
```

Task Management Functions supported by device:

```
Abort task
Abort task set
Clear ACA
Clear task set
Logical unit reset
Query task
```

Enumerate can be used to look up a SCSI command name in the absence of a device that supports that command. The opcode and service action (if required) should be supplied:

```
# sg_opcodes --enumerate --op=0x9b,0xa
SCSI command:
Read buffer(16), read data from echo buffer
```

## ENVIRONMENT VARIABLES

Since `sg3_utils` version 1.23 the environment variable `SG3_UTILS_OLD_OPTS` can be given. When it is present this utility will expect the older command line options. So the presence of this environment variable is equivalent to using `--old` (or `-O`) as the first command line option.

## AUTHOR

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## REPORTING BUGS

Report bugs to <dgilbert at interlog dot com>.

## COPYRIGHT

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## SEE ALSO

`sg_inq(sg3_utils)`