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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'sg_readcap.8' command

$ man sg_readcap.8

SG_READCAP(8) SG3_UTILS SG_READCAP(8)

NAME

sg_readcap - send SCSI READ CAPACITY command

SYNOPSIS

sg_readcap [--16] [--brief] [--help] [--hex] [--lba=LBA] [--long]

[--pmi] [--raw] [--readonly] [--verbose] [--version] [--zbc] DEVICE

sg_readcap [-16] [-b] [-h] [-H] [-lba=LBA] [-pmi] [-r] [-R] [-v] [-V]

[-z] DEVICE

DESCRIPTION

The normal action of the SCSI READ CAPACITY command is to fetch the number of blocks (and block size) from the DEVICE.

The SCSI READ CAPACITY command (both 10 and 16 byte cdbs) actually yield the block address of the last block and the block size. The num? ber of blocks is thus one plus the block address of the last block (as blocks are counted origin zero (i.e. starting at block zero)). This is the source of many "off by one" errors.

The READ CAPACITY(16) response provides additional information not found in the READ CAPACITY(10) response. This includes protection and logical block provisioning information, plus the number of logical blocks per physical block. So even though the media size may not exceed what READ CAPACITY(10) can show, it may still be useful to examine the response to READ CAPACITY(16). Sadly there are horrible SCSI command set implementations in the wild that crash when the READ CAPACITY(16)

command is sent to them.

Device capacity is the product of the number of blocks by the block size. This utility outputs this figure in bytes, MiB (1048576 bytes per MiB), GB (1000000000 bytes per GB) and, if large enough, TB (1000 GB).

If sg_readcap is called without the --long option then the 10 byte cdb version (i.e. READ CAPACITY (10)) is sent to the DEVICE. If the number of blocks in the response is reported as 0xffffffff (i.e. (2**32 - 1)) and the --hex option has not been given, then READ CAPACITY (16) is called and its response is output.

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

OPTIONS

Arguments to long options are mandatory for short options as well. The options are arranged in alphabetical order based on the long option name.

--16 Use the 16 byte cdb variant of the READ CAPACITY command. See the '--long' option. -b, --brief outputs two hex numbers (pre? fixed with '0x' and space separated) to stdout. The first number is the maximum number of blocks on the device (which is one plus the lba of the last accessible block). The second number is the size in bytes of each block. If the operation fails then "0x0 0x0" is written to stdout.

-h, --help

print out the usage message then exit.

-H, --hex

output the response to the READ CAPACITY command (either the 10 or 16 byte cdb variant) in ASCII hexadecimal on stdout.

-L, --lba=LBA

used in conjunction with --pmi option. This variant of READ CA? PACITY will yield the last block address after LBA prior to a

delay. For a disk, given a LBA it yields the highest numbered block on the same cylinder (i.e. before the heads need to move). LBA is assumed to be decimal unless prefixed by "0x" or it has a trailing "h". Defaults to 0. This option was made obsolete in SBC-3 revision 26.

-l, --long

Use the 16 byte cdb variant of the READ CAPACITY command. The default action is to use the 10 byte cdb variant which limits the maximum block address to (2**32 - 2). When a 10 byte cdb READ CAPACITY command is used on a device whose size is too large then a last block address of 0xffffffff is returned (if the device complies with SBC-2 or later).

-O, --old

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

-p, --pmi

partial medium indicator: for finding the next block address prior to some delay (e.g. head movement). In the absence of this option, the total number of blocks and the block size of the de? vice are output. Used in conjunction with the --lba=LBA option. This option was made obsolete in SBC-3 revision 26.

-r, --raw

output response in binary to stdout.

-R, --readonly

open the DEVICE read-only (e.g. in Unix with the O_RDONLY flag). The default for READ CAPACITY(16) is to open it read-write. The default for READ CAPACITY(10) is to open it read-only so this option does not change anything for this case.

-v, --verbose

increase level of verbosity. Can be used multiple times.

-V, --version

outputs version string then exits.

-z, --zbc

additionally prints out the extra ZBC field (RC_BASIS) in the

READ CAPACITY response. Using the option implicitly sets the --16 option.

NOTES

The response to READ CAPACITY(16) contains a LBPRZ bit in the SBC-3 standard (ANSI INCITS 514-2014). There was also a LBPRZ bit with the same meaning in the Logical block provisioning VPD page (0xb2). Then somewhat confusingly T10 expanded the LBPRZ bit to a 3 bit field in SBC-4 draft revision 7, but only in the LB provisioning VPD page. The reason for the expansion was to report a new "provisioning initializa? tion pattern" state (when an unmapped logical block is read). The new state has been assigned LBPRZ=2 in the VPD page and it re-uses LBPRZ=0 in the READ CAPACITY(16) response. LBPRZ=1 retains the same meaning for both variants, namely that a block of zeroes will be returned when an unmapped logical block is read.

EXIT STATUS

The exit status of sg_readcap 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.

-16 Use the 16 byte cdb variant of the READ CAPACITY command. Equivalent to --long in the main description.

-b utility outputs two hex numbers (prefixed with '0x' and space separated) to stdout. The first number is the maximum number of blocks on the device (which is one plus the lba of the last ac? cessible block). The second number is the size of each block. If the operation fails then "0x0 0x0" is written to stdout. Equiv? alent to --brief in the main description.

-h output the usage message then exit. Giving the -? option also outputs the usage message then exits.

-H output the response to the READ CAPACITY command (either the 10 or 16 byte cdb variant) in ASCII hexadecimal on stdout.

-lba=LBA

used in conjunction with -pmi option. This variant of READ CA? PACITY will yield the last block address after LBA prior to a delay. Equivalent to --lba=LBA in the main description.

-N, --new

Switch to the newer style options.

-pmi partial medium indicator: for finding the next block address prior to some delay (e.g. head movement). In the absence of this switch, the total number of blocks and the block size of the de? vice are output. Equivalent to --pmi in the main description.

-r output response in binary (to stdout).

-R Equivalent to --readonly in the main description.

-v verbose: print out cdb of issued commands prior to execution. '-vv' and '-vvv' are also accepted yielding greater verbosity.

-V outputs version string then exits.

-z Equivalent to --zbc in the main description.

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 environ? ment variable is equivalent to using --old (or -O) as the first command line option.

AUTHORS

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SEE ALSO

sg_inq(sg3_utils)