



Rocky Enterprise Linux 9.2 Manual Pages on command 'sg_verify.8'

\$ man sg_verify.8

SG_VERIFY(8) SG3_UTILS SG_VERIFY(8)

NAME

sg_verify - invoke SCSI VERIFY command(s) on a block device

SYNOPSIS

```
sg_verify [--0] [--16] [--bpc=BPC] [--count=COUNT] [--dpo] [--ff]
[--ebytchk=BCH] [--group=GN] [--help] [--in=IF] [--lba=LBA] [--ndo=NDO]
[--quiet] [--readonly] [--verbose] [--version] [--vrprotect=VRP] DEVICE
```

DESCRIPTION

Sends one or more SCSI VERIFY (10 or 16) commands to DEVICE. These SCSI commands are defined in the SBC-2 and SBC-3 standards at <https://www.t10.org> and SBC-4 drafts.

When --ndo=NDO is not given then the verify starts at the logical block address given by the --lba=LBA option and continues for --count=COUNT blocks. No more than --bpc=BPC blocks are verified by each VERIFY command so if necessary multiple VERIFY commands are sent. Medium verification operations are performed by the DEVICE (e.g. assuming each block has additional EEC data, check this against the logical block contents). No news is good news (i.e. if there are no verify errors de?

tected then no messages are sent to stderr and the Unix exit status is 0).

When `--ndo=NDO` is given then the `--bpc=BPC` option is ignored. A single `VERIFY` command is issued and a comparison starts at the logical block address given by the `--lba=LBA` option and continues for `--count=COUNT` blocks. The `VERIFY` command has an associated data-out buffer that is `NDO` bytes long. The contents of the data-out buffer are obtained from the `FN` file (if `--in=FN` is given) or from `stdin`. A comparison takes place between data-out buffer and the logical blocks on the `DEVICE`. If the comparison is good then no messages are sent to stderr and the Unix exit status is 0. If the comparison fails then a sense buffer with a sense key of `MISCOMPARE` is returned; in this case the Unix exit status will be 14. Messages will be sent to stderr associated with `MISCOMPARE` sense buffer unless the `--quiet` option is given.

In SBC-3 revision 34 the `BYTCHK` field in all SCSI `VERIFY` commands was expanded from one to two bits. That required some changes in the operations of this utility, see the section below on `OPTION CHANGES`.

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.

`-0, --0`

a buffer `NDO` bytes long full of zeros is sent as the data-out part of a `VERIFY` command. So `stdin` is not read and if `--in=IF` is given, an error is generated. Useful when `BCH` is 3 to check if some or all of `DEVICE` (e.g. a disk) is zero filled blocks.

`-S, --16`

uses a `VERIFY(16)` command (default `VERIFY(10)`). Even without this option, using an `--lba=LBA` which is too large, will cause the utility to issue a `VERIFY(16)` command.

`-b, --bpc=BPC`

this option is ignored if `--ndo=NDO` is given. Otherwise `BPC` specifies the maximum number of blocks that will be verified by

a single SCSI VERIFY command. The default value is 128 blocks which equates to 64 KB for a disk with 512 byte blocks. If BPC is less than COUNT then multiple SCSI VERIFY commands are sent to the DEVICE. For the default VERIFY(10) BPC cannot exceed 0xffff (65,535) while for VERIFY(16) BPC cannot exceed 0x7fffffff (2,147,483,647). For recent block devices (disks) this value may be constrained by the maximum transfer length field in the block limits VPD page.

-c, --count=COUNT

where COUNT specifies the number of blocks to verify. The default value is 1. If COUNT is greater than BPC (or its default value of 128) and NDO is not given, 0 or less than multiple SCSI VERIFY commands are sent to the device. Otherwise COUNT becomes the contents of the verification length field of the SCSI VERIFY command issued. The sg_readcap utility can be used to find the maximum number of blocks that a block device (e.g. a disk) has.

-d, --dpo

disable page out changes the cache retention priority of blocks read on the device's cache to the lowest priority. This means that blocks read by other commands are more likely to remain in the device's cache.

-E, --ebytchk=BCH

sets the BYTCHK field to BCH overriding the value (1) set by the --ndo=NDO option. Values of 1, 2 or 3 are accepted for BCH how? ever sbc3r34 reserves the value 2. If this option is given then --ndo=NDO must also be given. If BCH is 3 then NDO should be the size of one logical block (plus the size of some or all of the protection information if VRP is greater than 0).

-f, --ff

a buffer NDO bytes long full of 0xff bytes is sent as the data-out part of a VERIFY command. So stdin is not read and if --in=IF is given, an error is generated. Useful when BCH is 3 to check if some or all of DEVICE (e.g. a disk) is 0xff byte filled

blocks.

-g, --group=GN

where GN becomes the contents of the group number field in the SCSI VERIFY(16) command. It can be from 0 to 63 inclusive. The default value for GN is 0. Note that this option is ignored for the SCSI VERIFY(10) command.

-h, --help

output the usage message then exit.

-i, --in=IF

where IF is the name of a file from which NDO bytes will be read and placed in the data-out buffer. This is only done when the --ndo=NDO option is given. If this option is not given then stdin is read. If IF is "-" then stdin is also used.

-l, --lba=LBA

where LBA specifies the logical block address of the first block to start the verify operation. LBA is assumed to be decimal unless prefixed by '0x' or a trailing 'h' (see below). The default value is 0 (i.e. the start of the device).

-n, --ndo=NDO

NDO is the number of bytes to obtain from the FN file (if --in=FN is given) or from stdin. Those bytes are placed in the data-out buffer associated with the SCSI VERIFY command and NDO is placed in the verification length field in the cdb. The default value for NDO is 0 and the maximum value is dependent on the OS. If the --bychk=BCH option is not given then the BYCHK field in the cdb is set to 1.

-q, --quiet

suppress the sense buffer messages associated with a MISCOMPARE sense key that would otherwise be sent to stderr. Still set the exit status to 14 which is the sense key value indicating a MISCOMPARE.

-r, --readonly

opens the DEVICE read-only rather than read-write which is the

default. The Linux sg driver needs read-write access for the SCSI VERIFY command but other access methods may require read-only access.

-v, --verbose

increase the level of verbosity, (i.e. debug output).

-V, --version

print the version string and then exit.

-P, --vrprotect=VRP

where VRP is the value in the vrprotect field in the VERIFY command.

It must be a value between 0 and 7 inclusive. The default

value is zero.

BYTCHK

BYTCHK is the name of a field (two bits wide) in the VERIFY(10) and VERIFY(16) commands. When set to 1 or 3 (sbc3r34 reserves the value 2) it indicates that associated with the SCSI VERIFY command, a data-out buffer will be sent for the device (disk) to check. Using the --ndo=NDO option sets the BYTCHK field to 1 and NDO is the number of bytes placed in the data-out buffer. Those bytes are obtained from stdin or IF (from the --in=FN option). The --ebychk=BCH option may be used to override the BYTCHK field value of 1 with BCH.

The calculation of NDO is left up to the user. Its value depends on the logical block size (which can be found with the sg_readcap utility), the COUNT and the VRP values. If the VRP is greater than 0 then each logical block will contain an extra 8 bytes (at least) of protection information.

When the BYTCHK field is 0 then the verification process done by the device (disk) is vendor specific. It typically involves checking each block on the disk against its error correction codes (ECC) which is additional data also held on the disk.

Many Operating Systems put limits on the maximum size of the data-out (and data-in) buffer. For Linux at one time the limit was less than 1 MB but has been increased somewhat.

Earlier versions of this utility had a `--bychk=NDO` option which set the BYTCHK bit and set the cdb verification length field to NDO. The shorter form of that option was `-B NDO`. For backward compatibility that option is still present but not documented. In its place is the `--ndo=NDO` whose shorter form of `-n NDO`. `--ndo=NDO` sets the BYTCHK field to 1 unless that is overridden by the `--ebychk=BCH`.

NOTES

Various numeric arguments (e.g. LBA) may include multiplicative suffixes or be given in hexadecimal. See the "NUMERIC ARGUMENTS" section in the `sg3_utils(8)` man page.

The amount of error correction and the number of retries attempted before a block is considered defective are controlled in part by the Verify Error Recovery mode page. A note in the SBC-3 draft (rev 29 section 6.4.9 on the Verify Error Recovery mode page) advises that to minimize the number of checks (and hence have the most "sensitive" verify check) do the following in that mode page: set the EER bit to 0, the PER bit to 1, the DTE bit to 1, the DCR bit to 1, the verify retry count to 0 and the verify recovery time limit to 0. Mode pages can be modified with the `sdparm` utility.

The SCSI VERIFY(6) command defined in the SSC-2 standard and later (i.e. for tape drive systems) is not supported by this utility.

EXIT STATUS

The exit status of `sg_verify` is 0 when it is successful. When BCH is other than 0 then a comparison takes place and if it fails then the exit status is 14 which happens to be the sense key value of MISCOMPARE. Otherwise see the EXIT STATUS section in the `sg3_utils(8)` man page.

Earlier versions of this utility set an exit status of 98 when there was a MISCOMPARE.

AUTHORS

Written by Douglas Gilbert.

REPORTING BUGS

Report bugs to <dgilbert at interlog dot com>.

COPYRIGHT

Copyright ? 2004-2019 Douglas Gilbert

This software is distributed under a FreeBSD license. There is NO warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

SEE ALSO

sdparm(sdparm), sg_modes(sg3_utils), sg_readcap(sg3_utils),
sg_inq(sg3_utils)

sg3_utils-1.45 December 2019 SG_VERIFY(8)