

NAME

sfdisk – display or manipulate a disk partition table

SYNOPSIS

sfdisk [options] *device* [**-N** *partition-number*]

sfdisk [options] *command*

DESCRIPTION

sfdisk is a script-oriented tool for partitioning any block device.

Since version 2.26 **sfdisk** supports MBR (DOS), GPT, SUN and SGI disk labels, but no longer provides any functionality for CHS (Cylinder-Head-Sector) addressing. CHS has never been important for Linux, and this addressing concept does not make any sense for new devices.

sfdisk (since version 2.26) **aligns the start and end of partitions** to block-device I/O limits when relative sizes are specified, when the default values are used or when multiplicative suffixes (e.g. MiB) are used for sizes. It is possible that partition size will be optimized (reduced or enlarged) due to alignment if the start offset is specified exactly in sectors and partition size relative or by multiplicative suffixes.

The recommended way is not to specify start offsets at all and specify partition size in MiB, GiB (or so). In this case **sfdisk** align all partitions to block-device I/O limits (or when I/O limits are too small then to megabyte boundary to keep disk layout portable). If this default behaviour is unwanted (usually for very small partitions) then specify offsets and sizes in sectors. In this case **sfdisk** entirely follows specified numbers without any optimization.

sfdisk does not create the standard system partitions for SGI and SUN disk labels like **fdisk**(8) does. It is necessary to explicitly create all partitions including whole-disk system partitions.

sfdisk uses BLKRRPART (reread partition table) ioctl to make sure that the device is not used by system or another tools (see also **--no-reread**). It's possible that this feature or another **sfdisk** activity races with **udev**d. The recommended way how to avoid possible collisions is to use exclusive flock for the whole-disk device to serialize device access. The exclusive lock will cause udevd to skip the event handling on the device. For example:

```
flock /dev/sdc sfdisk /dev/sdc
```

Note, this semantic is not currently supported by udevd for MD and DM devices.

COMMANDS

The commands are mutually exclusive.

[**-N** *partition-number*] *device*

The default **sfdisk** command is to read the specification for the desired partitioning of *device* from standard input, and then create a partition table according to the specification. See below for the description of the input format. If standard input is a terminal, then **sfdisk** starts an interactive session.

If the option **-N** is specified, then the changes are applied to the partition addressed by *partition-number*. The unspecified fields of the partition are not modified.

Note that it's possible to address an unused partition with **-N**. For example, an MBR always contains 4 partitions, but the number of used partitions may be smaller. In this case **sfdisk** follows the default values from the partition table and does not use built-in defaults for the unused partition given with **-N**. See also **--append**.

-A, --activate *device* [*partition-number...*]

Switch on the bootable flag for the specified partitions and switch off the bootable flag on all unspecified partitions. The special placeholder '-' may be used instead of the partition numbers to switch off the bootable flag on all partitions.

The activation command is supported for MBR and PMBR only. If GPT label is detected than sfdisk prints warning and automatically enter PMBR.

If no *partition-number* is specified, then list the partitions with an enabled flag.

--delete *device* [*partition-number...*]

Delete all or the specified partitions.

-d, --dump *device*

Dump the partitions of a device in a format that is usable as input to **sfdisk**. See the section **BACKING UP THE PARTITION TABLE**.

-g, --show-geometry [*device...*]

List the geometry of all or the specified devices. For backward compatibility the deprecated option **--show-pt-geometry** have the same meaning as this one.

-J, --json *device*

Dump the partitions of a device in JSON format. Note that **sfdisk** is not able to use JSON as input format.

-l, --list [*device...*]

List the partitions of all or the specified devices. This command can be used together with **--verify**.

-F, --list-free [*device...*]

List the free unpartitioned areas on all or the specified devices.

--part-attrs *device* *partition-number* [*attributes*]

Change the GPT partition attribute bits. If *attributes* is not specified, then print the current partition settings. The *attributes* argument is a comma- or space-delimited list of bits. The currently supported attribute bits are: RequiredPartition, NoBlockIOProtocol, LegacyBIOSBootable and GUID-specific bits in the range from 48 to 63. For example, the string "RequiredPartition,50,51" sets three bits.

--part-label *device* *partition-number* [*label*]

Change the GPT partition name (label). If *label* is not specified, then print the current partition label.

--part-type *device* *partition-number* [*type*]

Change the partition type. If *type* is not specified, then print the current partition type. The *type* argument is hexadecimal for MBR, or a GUID for GPT. For backward compatibility the options **-c** and **--id** have the same meaning as this one.

--part-uuid *device* *partition-number* [*uuid*]

Change the GPT partition UUID. If *uuid* is not specified, then print the current partition UUID.

-r, --reorder *device*

Renumber the partitions, ordering them by their start offset.

-s, --show-size [*device...*]

List the sizes of all or the specified devices in units of 1024 byte size. This command is DEPRECATED in favour of **blockdev(1)**.

-T, --list-types

Print all supported types for the current disk label or the label specified by **--label**.

- V, --verify** [*device...*]
 Test whether the partition table and partitions seem correct.

OPTIONS

- a, --append**
 Don't create a new partition table, but only append the specified partitions.
- b, --backup**
 Back up the current partition table sectors before starting the partitioning. The default backup file name is `~/sfdisk-<device>-<offset>.bak`; to use another name see option **-O, --backup-file**.
- color[=*when*]**
 Colorize the output. The optional argument *when* can be **auto**, **never** or **always**. If the *when* argument is omitted, it defaults to **auto**. The colors can be disabled; for the current built-in default see the **--help** output. See also the **COLORS** section.
- f, --force**
 Disable all consistency checking.
- Linux**
 Deprecated and ignored option. Partitioning that is compatible with Linux (and other modern operating systems) is the default.
- n, --no-act**
 Do everything except writing to the device.
- no-reread**
 Do not check through the re-read-partition-table ioctl whether the device is in use.
- no-tell-kernel**
 Don't tell the kernel about partition changes. This option is recommended together with **--no-reread** to modify a partition on used disk. The modified partition should not be used (e.g. mounted).
- O, --backup-file** *path*
 Override the default backup file name. Note that the device name and offset are always appended to the file name.
- move-data[=*path*]**
 Move data after partition relocation, for example when moving the beginning of a partition to another place on the disk. The size of the partition has to remain the same, the new and old location may overlap. This option requires option **-N** in order to be processed on one specific partition only.

The *path* overrides the default log file name (the default is `~/sfdisk-<devname>.move`). The log file contains information about all read/write operations on the partition data.

Note that this operation is risky and not atomic. **Don't forget to backup your data!**

In the example below, the first command creates a 100MiB free area before the first partition and moves the data it contains (e.g. a filesystem), the next command creates a new partition from the free space (at offset 2048), and the last command reorders partitions to match disk order (the original `sdcl` will become `sdcl2`).

```
echo '+100M,' | sfdisk --move-data /dev/sdc -N 1
echo '2048,' | sfdisk /dev/sdc --append
sfdisk /dev/sdc --reorder
```

-o, --output *list*

Specify which output columns to print. Use **--help** to get a list of all supported columns.

The default list of columns may be extended if *list* is specified in the format **+*list*** (e.g. **-o +UUID**).

-q, --quiet

Suppress extra info messages.

-u, --unit *S*

Deprecated option. Only the sector unit is supported. This option is not supported when using the **--show-size** command.

-X, --label *type*

Specify the disk label type (e.g. **dos**, **gpt**, ...). If this option is not given, then **sfdisk** defaults to the existing label, but if there is no label on the device yet, then the type defaults to **dos**. The default or the current label may be overwritten by the "label: <name>" script header line. The option **--label** does not force **sfdisk** to create empty disk label (see the **EMPTY DISK LABEL** section below).

-Y, --label-nested *type*

Force editing of a nested disk label. The primary disk label has to exist already. This option allows to edit for example a hybrid/protective MBR on devices with GPT.

-w, --wipe *when*

Wipe filesystem, RAID and partition-table signatures from the device, in order to avoid possible collisions. The argument *when* can be **auto**, **never** or **always**. When this option is not given, the default is **auto**, in which case signatures are wiped only when in interactive mode; except the old partition-table signatures which are always wiped before create a new partition-table if the argument *when* is not **never**. In all cases detected signatures are reported by warning messages before a new partition table is created. See also **wipefs(8)** command.

-W, --wipe-partitions *when*

Wipe filesystem, RAID and partition-table signatures from a newly created partitions, in order to avoid possible collisions. The argument *when* can be **auto**, **never** or **always**. When this option is not given, the default is **auto**, in which case signatures are wiped only when in interactive mode and after confirmation by user. In all cases detected signatures are reported by warning messages after a new partition is created. See also **wipefs(8)** command.

-v, --version

Display version information and exit.

-h, --help

Display help text and exit.

INPUT FORMATS

sfdisk supports two input formats and generic header lines.

Header lines

The optional header lines specify generic information that apply to the partition table. The header-line format is:

<name>: <value>

The currently recognized headers are:

unit Specify the partitioning unit. The only supported unit is **sectors**.

- label** Specify the partition table type. For example **dos** or **gpt**.
- label-id** Specify the partition table identifier. It should be a hexadecimal number (with a 0x prefix) for MBR and a UUID for GPT.
- first-lba** Specify the first usable sector for GPT partitions.
- last-lba** Specify the last usable sector for GPT partitions.
- table-length** Specify the maximal number of GPT partitions.
- grain** Specify minimal size in bytes used to calculate partitions alignment. The default is 1MiB and it's strongly recommended to use the default. Do not modify this variable if you're not sure.

Note that it is only possible to use header lines before the first partition is specified in the input.

Unnamed-fields format

start size type bootable

where each line fills one partition descriptor.

Fields are separated by whitespace, comma or semicolon possibly followed by whitespace; initial and trailing whitespace is ignored. Numbers can be octal, decimal or hexadecimal; decimal is the default. When a field is absent, empty or specified as '-' a default value is used. But when the **-N** option (change a single partition) is given, the default for each field is its previous value.

The default value of *start* is the first non-assigned sector aligned according to device I/O limits. The default start offset for the first partition is 1 MiB. The offset may be followed by the multiplicative suffixes (KiB, MiB, GiB, TiB, PiB, EiB, ZiB and YiB) then the number is interpreted as offset in bytes.

The default value of *size* indicates "as much as possible"; i.e. until the next partition or end-of-device. A numerical argument is by default interpreted as a number of sectors, however if the size is followed by one of the multiplicative suffixes (KiB, MiB, GiB, TiB, PiB, EiB, ZiB and YiB) then the number is interpreted as the size of the partition in bytes and it is then aligned according to the device I/O limits. A '+' can be used instead of a number to enlarge the partition as much as possible. Note '+' is equivalent to the default behaviour for a new partition; existing partitions will be resized as required.

The partition *type* is given in hex for MBR (DOS), without the 0x prefix, a GUID string for GPT, or a shortcut:

- | | |
|----------|--|
| L | Linux; means 83 for MBR and 0FC63DAF-8483-4772-8E79-3D69D8477DE4 for GPT. |
| S | swap area; means 82 for MBR and 0657FD6D-A4AB-43C4-84E5-0933C84B4F4F for GPT |
| E | extended partition; means 5 for MBR |
| H | home partition; means 933AC7E1-2EB4-4F13-B844-0E14E2AEF915 for GPT |
| X | linux extended partition; means 85 for MBR. |

U	EFI System partition, means EF for MBR and C12A7328-F81F-11D2-BA4B-00A0C93EC93B for GPT
R	Linux RAID; means FD for MBR and A19D880F-05FC-4D3B-A006-743F0F84911E for GPT
V	LVM; means 8E for MBR and E6D6D379-F507-44C2-A23C-238F2A3DF928 for GPT

The default *type* value is *L*

bootable is specified as [***|-], with as default not-bootable. The value of this field is irrelevant for Linux - when Linux runs it has been booted already - but it might play a role for certain boot loaders and for other operating systems.

Named-fields format

This format is more readable, robust, extensible and allows to specify additional information (e.g. a UUID). It is recommended to use this format to keep your scripts more readable.

[*device* :] *name*[=*value*], ...

The *device* field is optional. **sfdisk** extracts the partition number from the device name. It allows to specify the partitions in random order. This functionality is mostly used by **--dump**. Don't use it if you are not sure.

The *value* can be between quotation marks (e.g. *name*="This is partition name"). The currently supported fields are:

start=number

The first non-assigned sector aligned according to device I/O limits. The default start offset for the first partition is 1 MiB. The offset may be followed by the multiplicative suffixes (KiB, MiB, GiB, TiB, PiB, EiB, ZiB and YiB) then the number is interpreted as offset in bytes.

size=number

Specify the partition size in sectors. The number may be followed by the multiplicative suffixes (KiB, MiB, GiB, TiB, PiB, EiB, ZiB and YiB), then it's interpreted as size in bytes and the size is aligned according to device I/O limits.

bootable

Mark the partition as bootable.

attrs=string

Partition attributes, usually GPT partition attribute bits. See **--part-attrs** for more details about the GPT-bits string format.

uuid=string

GPT partition UUID.

name=string

GPT partition name.

type=code

A hexadecimal number (without 0x) for an MBR partition, or a GUID for a GPT partition. For backward compatibility the **Id=** field has the same meaning.

EMPTY DISK LABEL

sfdisk does not create partition table without partitions by default. The lines with partitions are expected in the script by default. The empty partition table has to be explicitly requested by "label: <name>" script header line without any partitions lines. For example:

```
echo 'label: gpt' | sfdisk /dev/sdb
```

creates empty GPT partition table. Note that the **--append** disables this feature.

BACKING UP THE PARTITION TABLE

It is recommended to save the layout of your devices. **sfdisk** supports two ways.

Use the **--dump** option to save a description of the device layout to a text file. The dump format is suitable for later **sfdisk** input. For example:

```
sfdisk --dump /dev/sda > sda.dump
```

This can later be restored by:

```
sfdisk /dev/sda < sda.dump
```

If you want to do a full (binary) backup of all sectors where the partition table is stored, then use the **--backup** option. It writes the sectors to `~/sfdisk-<device>-<offset>.bak` files. The default name of the backup file can be changed with the **--backup-file** option. The backup files contain only raw data from the *device*. Note that the same concept of backup files is used by **wipefs**(8). For example:

```
sfdisk --backup /dev/sda
```

The GPT header can later be restored by:

```
dd if=~/sfdisk-sda-0x00000200.bak of=/dev/sda \
seek=$((0x00000200)) bs=1 conv=notrunc
```

Note that **sfdisk** since version 2.26 no longer provides the **-I** option to restore sectors. **dd**(1) provides all necessary functionality.

COLORS

Implicit coloring can be disabled by an empty file `/etc/terminal-colors.d/sfdisk.disable`.

See **terminal-colors.d**(5) for more details about colorization configuration. The logical color names supported by **sfdisk** are:

header The header of the output tables.

warn The warning messages.

welcome

The welcome message.

NOTES

Since version 2.26 **sfdisk** no longer provides the **-R** or **--re-read** option to force the kernel to reread the partition table. Use **blockdev --rereadpt** instead.

Since version 2.26 **sfdisk** does not provide the **--DOS**, **--IBM**, **--DOS-extended**, **--unhide**, **--show-extended**, **--cylinders**, **--heads**, **--sectors**, **--inside-outer**, **--not-inside-outer** options.

ENVIRONMENT

SFDISK_DEBUG=all

enables **sfdisk** debug output.

LIBFDISK_DEBUG=all
enables libfdisk debug output.

LIBBLKID_DEBUG=all
enables libblkid debug output.

LIBSMARTCOLS_DEBUG=all
enables libsmartcols debug output.

SEE ALSO

fdisk(8), **cfdisk(8)**, **parted(8)**, **partprobe(8)**, **partx(8)**

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The current sfdisk implementation is based on the original sfdisk from Andries E. Brouwer.

AVAILABILITY

The sfdisk command is part of the util-linux package and is available from <https://www.kernel.org/pub/linux/utils/util-linux/>.