howto, windows, external, usb, storage, hdd, msdos, partitiontable, partition, format, filesystem, parted, mkfs, vfat, fat32

Format external USB storage for windows

Sources

- https://linux.die.net/man/8/parted
- https://rainbow.chard.org/2013/01/30/how-to-align-partitions-for-best-performance-using-parted/
- https://linuxhandbook.com/bash-arithmetic-operators/
- https://www.linuxscrew.com/bash-math-arithmetic
- https://people.redhat.com/msnitzer/docs/io-limits.txt
- https://blog.hqcodeshop.fi/archives/273-GNU-Parted-Solving-the-dreaded-The-resulting-partition-is-not-properly-aligned-for-best-performance.html
- https://chris-linux-blog.blogspot.com/2015/11/avoiding-resulting-partition-is-not.html

How to do it

Display connected block devices:

```
lsblk
```

```
NAME   MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0    7:0    0  65.2M  1 loop /snap/gtk-common-themes/1519
loop1    7:1    0  65.1M  1 loop /snap/gtk-common-themes/1515
loop2    7:2    0  42.2M  1 loop /snap/snapd/14066
loop3    7:3    0 162.9M  1 loop /snap/gnome-3-28-1804/145
loop4    7:4    0  61.5M  1 loop /snap/authy/7
loop5    7:5    0     4K  1 loop /snap/bare/5
loop6    7:6    0  55.5M  1 loop /snap/core18/2284
loop7    7:7    0  55.5M  1 loop /snap/core18/2253
loop8    7:8    0 164.8M  1 loop /snap/gnome-3-28-1804/161
loop9    7:9    0  61.3M  1 loop /snap/authy/6
loop10   7:10   0  43.3M  1 loop /snap/snapd/14295
sda      8:0    0 238.5G  0 disk
├─sda1   8:1    0     8M  0 part
├─sda2   8:2    0 222.9G  0 part /home
│                                /var
│                                /usr/local
│                                /root
│                                /srv
│                                /opt
│                                /boot/grub2/x86_64-efi
│                                /boot/grub2/i386-pc
│                                /.snapshots
│                                /
└─sda3   8:3    0  15.6G  0 part [SWAP]
sdb      8:16   0 465.8G  0 disk
└─sdb1   8:17   0 465.8G  0 part
sr0     11:0    1  1024M  0 rom
```

In my case the connected USB HDD is /dev/sdb. Verify that sdb is the correct device

```
parted /dev/sdb print
```

```
Model: BUFFALO External HDD (scsi)
Disk /dev/sdb: 500GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start  End    Size   Type     File system  Flags
 1      131kB  500GB  500GB  primary  ext4         type=83
```

create a fresh msdos partition table

```
parted /dev/sdb mklabel msdos
```

```
Warning: The existing disk label on /dev/sdb will be destroyed and all data on this disk will be lost.
Do you want to continue?
Yes/No?
```

press Y

```
Information: You may need to update /etc/fstab.
```

create the new partition

```
parted -a optimal /dev/sdb mkpart primary fat32 0% 100%
```

```
Information: You may need to update /etc/fstab.
```

check if the partition is aligned correctly

```
parted /dev/sdb align-check optimal 1
```

```
1 aligned
```

check the partition

```
parted /dev/sdb print
```

```
Model: BUFFALO External HDD (scsi)
Disk /dev/sdb: 500GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start   End    Size   Type     File system  Flags
 1      1049kB  500GB  500GB  primary               lba, type=0c
```

now format the partition

```
mkfs.vfat -v /dev/sdb1
```

```
mkfs.fat 4.2 (2021-01-31)
Auto-selecting FAT32 for large filesystem
/dev/sdb1 has 255 heads and 63 sectors per track,
hidden sectors 0x0800;
logical sector size is 512,
using 0xf8 media descriptor, with 976771026 sectors;
drive number 0x80;
filesystem has 2 32-bit FATs and 64 sectors per cluster.
FAT size is 119232 sectors, and provides 15258320 clusters.
There are 64 reserved sectors.
Volume ID is aa1a69ca, no volume label.
```

~~DISCUSSION~~