fdisk Disk partitioning

START HERE

`lsblk`
Find the right disk

`sudo mkfs.ext4 <part>`
Format the partition

`sudo fdisk -l <disk>`
Show its partitions

`sudo mount <part> <dir>`
Use it

`sudo fdisk <disk>`
Open interactive editor

`g`
New GPT table (in fdisk)

`n`
Add a partition (in fdisk)

`w`
Write and exit (in fdisk)

Partition table fdisk / sfdisk → `partprobe` → **Partition** /dev/sdb1 → `mkfs` → **Filesystem** ext4, xfs, swap → `mount` → **Mount point** /mnt/data

CONCEPTS

Triple-check the device name with lsblk before you write. Writing a partition table to the wrong disk destroys its data.

fdisk keeps every change in memory until you press w. q leaves without touching the disk.

MBR (dos) tops out at 2 TiB and 4 primary partitions. GPT has neither limit and is the default choice for new disks.

Whole-disk device is /dev/sdb, the partition is /dev/sdb1. NVMe and loop devices add a p: /dev/nvme0n1p1.

INSPECT

`lsblk`
Tree of disks and partitions

`lsblk -f`
Add filesystem type, label, UUID

`sudo fdisk -l`
List partition tables of all disks

`sudo fdisk -l <disk>`
List one disk's table

`lsblk -o NAME,SIZE,UUID`
Pick your own columns

INSPECT (cont.)

`sudo blkid`
UUIDs and filesystem types

`sudo sfdisk -F <disk>`
List free unpartitioned areas

INTERACTIVE FDISK

`sudo fdisk <disk>`
Edit a disk's partition table

`m`
Show the command menu

`p`
Print the table as edited so far

`g`
New empty GPT table

`o`
New empty MBR (DOS) table

`n`
Add a partition

`d`
Delete a partition

`t`
Change partition type

`w`
Write changes and exit

`q`
Quit without saving

`v`
Verify the table

`i`
Info about one partition

INTERACTIVE FDISK (cont.)

`F`
List free unpartitioned space

`l`
List known partition types

`a`
Toggle bootable flag (MBR only)

`I / O`
Load / dump layout as sfdisk script

CREATING A PARTITION

`n Enter Enter +<size>`
Next number, first free sector, given size
Press Enter to accept defaults. Sizes take K, M, G, T suffixes, e.g. +20G.

`n Enter Enter Enter`
Use all remaining space

`t <n> linux`
Linux filesystem type (alias)
Aliases exist in fdisk 2.36 and later; otherwise pick a number from L.

`t <n> swap`
Linux swap type

`t <n> lvm`
Linux LVM type

`t <n> uefi`
EFI System partition type

APPLY AND FORMAT

`sudo partprobe <disk>`
Tell the kernel about new partitions
Part of the parted package; not installed everywhere.

`sudo mkfs.ext4 <part>`
Format as ext4

`sudo mkfs.xfs <part>`
Format as XFS

`sudo mkfs.vfat -F 32 <part>`
Format as FAT32 (EFI, USB)

`sudo mkswap <part>`
Prepare swap space

`sudo swapon <part>`
Enable swap now

`sudo mkfs.ext4 -L <label> <part>`
Format with a label

`sudo mount <part> <dir>`
Mount it

`sudo blkid <part>`
UUID for /etc/fstab

SFDISK (SCRIPTING)

`sudo sfdisk -d <disk> > <file>`
Dump the table to a file

SFDISK (SCRIPTING) (cont.)

`sudo sfdisk <disk> < <file>`
Restore or apply a layout
Overwrites the table without asking when stdin is a file.

`sudo sfdisk --delete <disk> <n>`
Delete partition n

`sudo sfdisk -b <disk>`
Back up table sectors first

SAFETY AND CLEANUP

`sudo wipefs <disk>`
List signatures (no changes)

`sudo wipefs -a <disk>`
Erase all signatures
Destructive: the disk stops looking like a disk with data.

`sudo umount <part>`
Unmount before editing

fdisk will not stop you from deleting a mounted or used partition. Unmount first, and keep a table dump from sfdisk.

Resizing a partition does not resize its filesystem. Grow the partition first, then resize2fs / xfs_growfs; shrink in the reverse order.

SAFETY AND CLEANUP (cont.)

To undo a mistake after w, you need the dumped table. Restore with sfdisk, then check with fsck before mounting.

RECIPES

New GPT disk with one ext4 partition

```
lsblk
sudo fdisk /dev/sdb      # g, n, Enter x3, w
sudo mkfs.ext4 /dev/sdb1
sudo mount /dev/sdb1 /mnt
```

Clone a layout to another disk

```
sudo sfdisk -d /dev/sda > sda.dump
# review sda.dump, then:
sudo sfdisk -n /dev/sdb < sda.dump
sudo sfdisk /dev/sdb < sda.dump
```

Scripted GPT layout, no prompts

```
sudo sfdisk /dev/sdb <<EOF
label: gpt
,512M,U
,,L
EOF
```

Partition for LVM

```
sudo fdisk /dev/sdb      # g, n, t, lvm, w
sudo pvcreate /dev/sdb1
sudo vgcreate vg0 /dev/sdb1
```