mount and lsblk Disks and mounts

START HERE

`lsblk -f`
Disks, filesystems, UUIDs

`findmnt`
What is mounted where

`sudo mount <device> <dir>`
Mount a filesystem

`sudo mount -o ro <device> <dir>`
Mount read-only

`sudo umount <dir>`
Unmount it

`sudo blkid`
UUIDs and labels

`findmnt --verify`
Check fstab for errors

`sudo mount -a`
Mount everything in fstab

Block device /dev/sdb1 `mkfs` → **Filesystem** UUID, label `mount` → **Mount point** /mnt/data `umount` → **Detached** safe to unplug

CONCEPTS

Mount points are just directories: mounting hides whatever was in them until you unmount.

Use UUID= in fstab: /dev/sdX names can change between boots.

DISCOVER

`lsblk`
Tree of block devices

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

`lsblk -o NAME,SIZE,TYPE,FSTYPE,MOUNTPOINTS`
Pick your own columns

`lsblk -p`
Show full /dev paths

`lsblk -J`
JSON output for scripts

`sudo blkid`
List UUID, label and type of devices

`sudo blkid <device>`
Probe a single device

`findmnt`
Tree of mounted filesystems

`findmnt <dir>`
Which filesystem backs this mount point

`findmnt -T <path>`
Mount holding any path

`findmnt -t ext4,xfs`
Only some filesystem types

`findmnt --real`
Hide pseudo filesystems

`findmnt -D`
Output like df

`findmnt -s`
Read fstab instead of live mounts

`findmnt -o TARGET,SOURCE,FSTYPE,OPTIONS`
Choose columns

`mount`
List mounts (noisy, includes pseudo)

`mount -t <type>`
List mounts of one type

MOUNT AND UNMOUNT

`sudo mount <device> <dir>`
Mount, type auto-detected

`sudo mount -t <type> <device> <dir>`
Force the filesystem type

`sudo mount -o <opts> <device> <dir>`
Mount with comma-separated options

`sudo mount -r <device> <dir>`
Mount read-only

`sudo mount UUID=<uuid> <dir>`
Mount by UUID

`sudo mount -L <label> <dir>`
Mount by label

`sudo mount -m <device> <dir>`
Create the mount point first

`sudo mount -a`
Mount all fstab entries not yet mounted

`sudo mount <dir>`
Mount using the fstab entry for <dir>

`sudo mount -o loop <file.iso> <dir>`
Mount an image file

`sudo mount -o ro,loop <file.iso> <dir>`
Mount an ISO read-only

`sudo mount -f -v <device> <dir>`
Dry run, verbose

`sudo umount <dir>`
Unmount by mount point

`sudo umount <device>`
Unmount by device

`sudo umount -l <dir>`
Lazy: detach now, clean up later
Use when busy and safe to detach; open files stay usable until closed.

`sudo umount -R <dir>`
Unmount the whole tree below

`sudo umount -f <dir>`
Force (mostly for dead NFS)

"target is busy": find the culprit with lsof +f -- <dir> or fuser -vm <dir>, or cd out of it.

BIND AND REMOUNT

`sudo mount --bind <dir> <other>`
Make a directory visible at a second path

`sudo mount --rbind <dir> <other>`
Bind including submounts

`sudo mount -o remount,ro <dir>`
Switch a live mount to read-only

`sudo mount -o remount,rw <dir>`
Switch a live mount to read-write

`sudo mount -o remount,noatime <dir>`
Change options without unmounting

`sudo mount --bind -o ro <dir> <other>`
Read-only view of a directory
Needs util-linux 2.27+; older: bind, then remount,bind,ro.

`sudo mount --move <old> <new>`
Move a mount point atomically

`sudo mount --make-private <dir>`
Stop mount event propagation

`sudo mount -t tmpfs -o size=<size> tmpfs <dir>`
RAM-backed scratch space

`sudo mount -t nfs <host>:<export> <dir>`
Mount an NFS share

`sudo mount -t cifs // <host>/<share> <dir> -o username=<user>`
Mount an SMB share
Needs the cifs-utils package.

FSTAB AND OPTIONS

fstab fields (/etc/fstab)

#	Field	Example
1	device or UUID=	UUID=1a2b-3c4d
2	mount point	/data
3	filesystem type	ext4
4	options	defaults,noatime
5	dump (legacy)	0
6	fsck order	2

A typical fstab line

```
# device        dir    type
options           dump pass
UUID=<uuid>    /data  ext4
defaults,noatime  0    2
```

FSTAB AND OPTIONS (cont.)

Common options

Option	Effect
`defaults`	rw,suid,dev,exec,auto,r
`ro / rw`	read-only / read-write
`noexec`	forbid running binaries
`nosuid`	ignore setuid bits
`nodev`	ignore device files
`noatime`	skip access-time writes
`nofail`	do not fail boot if absent
`noauto`	skip on mount -a and boot
`user`	non-root users may mount
`x-systemd.automount`	mount on first access

`findmnt --verify`
Lint fstab before rebooting

`sudo systemctl daemon-reload`
Make systemd re-read fstab

`findmnt --verify --verbose`
Show every check

Test an fstab edit with mount -a before rebooting; a bad entry can drop boot into emergency mode.

Put nofail on removable or network disks so a missing one cannot block boot.

RECIPES

Mount a new USB disk

```
lsblk -f
sudo mkdir -p /mnt/usb
sudo mount /dev/sdb1 /mnt/usb
# when done
sudo umount /mnt/usb
```

Persist a disk across reboots

```
lsblk -f                                #
note the UUID
sudo mkdir -p /data
echo 'UUID=<uuid> /data ext4
defaults,nofail 0 2' | sudo tee
-a /etc/fstab
findmnt --verify && sudo mount
-a
```

Inspect an ISO

```
sudo mount -o loop,ro
image.iso /mnt
ls /mnt
sudo umount /mnt
```

Fix a read-only root, then undo

```
sudo mount -o remount,rw /
# edit what you need
sudo mount -o remount,ro /
```