# df and du Disk space usage

## CONCEPTS

df asks the filesystem how full it is; du walks the tree and adds up files. Their numbers can differ.

These are GNU flags. BSD/macOS df and du differ: no --inodes, --apparent-size or --output.

**df** disk is full?
↓ which mount
**du -x** which directory?
↓ drill down
**du -d 1** which subdir / file?

Full disk but df -i shows 100% IUse? You ran out of inodes (many tiny files), not bytes.

## DF: FREE SPACE

**df -h**
Human-readable sizes (powers of 1024)

**df -h** *<path>*
Only the filesystem containing <path>

**df -hT**
Show filesystem type column

**df -i**
Inodes instead of blocks

**df -H**
Sizes in powers of 1000 (like disk vendors)

**df -t** *<type>*
Only filesystems of this type

**df -x tmpfs -x devtmpfs**
Hide filesystem types

**df -l**
Local filesystems only (skip NFS)

**df --total**
Add a grand total row

**df --output=source,avail,target**
Pick the columns (see detail for fields)

## DU: DIRECTORY SIZE

**du -sh** *<dir>*
Total for one directory

**du -h -d 1** *<dir>*
Size of each direct subdirectory

**du -sh ***
Size of each item in the cwd

**du -ah** *<dir>*
Every file, not just directories

**du -h -d 1** *<dir>* **| sort -h**
Sort smallest to biggest

**du -ah** *<dir>* **| sort -rh | head**
Top 10 space users

**du -xh -d 1** *<dir>*
Don't cross filesystem boundaries

**du -ch** *<file>***...**
Per item plus grand total

**du -t** *<size>* **-ah** *<dir>*
Skip entries under <size> (negative: over)

**du --exclude='***<pattern>***'** *<dir>*
Skip matching names

**du --apparent-size -sh** *<dir>*
Content size, not disk blocks

**du -S** *<dir>*
Exclude subdirectories from each dir's size

**du --time -h -d 1** *<dir>*
Add newest modification time

**du --inodes -d 1** *<dir>* **| sort -n**
File count per directory

## RECIPES

**Find what fills the disk**

```
df -h
# pick the full mount, then descend
du -xh -d 1 / | sort -h | tail
du -xh -d 1 /var | sort -h | tail
```