# btrfs Copy-on-write filesystem

## CONCEPTS

A subvolume looks like a directory but snapshots, quotas and send work per subvolume. Snapshots are cheap copy-on-write clones.

**Filesystem** one or more devices
- **Subvolume** top-level (ID 5) and children
  - **Snapshot** a subvolume sharing data

## INSPECT

**btrfs filesystem show**
List filesystems and their devices

**btrfs filesystem usage** *<path>*
Show allocated, free and unallocated space

**btrfs filesystem df** *<path>*
Show space per chunk type

**btrfs filesystem usage -T** *<path>*
Show usage as a table

**btrfs device usage** *<path>*
Show allocation per device

## SUBVOLUMES

**btrfs subvolume create** *<path>*
Create a subvolume

**btrfs subvolume list** *<path>*
List subvolumes

**btrfs subvolume delete** *<path>*
Delete a subvolume

**btrfs subvolume show** *<path>*
Show UUID, generation and flags

## SNAPSHOTS

**btrfs subvolume snapshot** *<src> <dst>*
Snapshot a subvolume (read-write)

**btrfs subvolume snapshot -r** *<src> <dst>*
Snapshot a subvolume read-only

**btrfs property get -ts** *<path>* **ro**
Check the read-only flag

**btrfs property set -ts** *<path>* **ro false**
Make a snapshot writable

## SEND AND RECEIVE

**btrfs send** *<snap>* **| btrfs receive** *<dir>*
Copy a read-only snapshot

**btrfs send -p** *<parent> <snap>* **| btrfs receive** *<dir>*
Send only the changes since a parent

**btrfs send -f** *<file> <snap>*
Write a send stream to a file

**btrfs receive -f** *<file> <dir>*
Read a send stream from a file

Only read-only subvolumes can be sent. An incremental send needs the same parent snapshot present on both sides.

## SCRUB AND BALANCE

**btrfs scrub start** *<path>*
Verify checksums in the background

**btrfs scrub status** *<path>*
Show scrub progress and errors

**btrfs balance start -dusage=50** *<path>*
Compact data chunks under 50% full

**btrfs balance start -dusage=0** *<path>*
Free completely empty data chunks

**btrfs balance status** *<path>*
Show balance progress

**btrfs balance start -dconvert=raid1 -mconvert=raid1** *<path>*
Convert to another RAID profile

## DEVICES AND MAINTENANCE

**btrfs device add** *<dev> <path>*
Add a device to a mounted filesystem

**btrfs device remove** *<dev> <path>*
Remove a device, moving its data off

**btrfs filesystem resize max** *<path>*
Grow to fill the device

## REPAIR

**btrfs check** *<dev>*
Check an unmounted filesystem (read-only)