BTRFS

Creating array of disks

 # ls /dev/sd*
/dev/sda
/dev/sda1
/dev/sda2
/dev/sda5
/dev/sdb # NEW DISK
/dev/sdc # NEW DISK

 # mkfs.btrfs -f /dev/sdb /dev/sdc

 # mkfs.btrfs -f -m raid1 -d raid0 /dev/sdb /dev/sdc

- This create automatically raid 0 on data, raid 1 on metadata, raid1 on system
- UUID is the same for /dev/sdb and /dev/sdc
- UUID can be use to mount the FS
- Second command define the metadata as raid 1 and data as raid0

```
root@debian-vm:/home/ilan# mkfs.btrfs  /dev/sdb /dev/sdc
btrfs-progs v4.20.1
See http://btrfs.wiki.kernel.org for more information.

Label:              (null)
UUID:               da443907-442e-42d8-a6fe-01bcfd20ce7c
Node size:          16384
Sector size:        4096
Filesystem size:    4.00GiB
Block group profiles:
  Data:             RAID0           409.50MiB
  Metadata:         RAID1           204.75MiB
  System:           RAID1             8.00MiB
SSD detected:       no
Incompat features:  extref, skinny-metadata
Number of devices:  2
Devices:
   ID        SIZE  PATH
    1     2.00GiB  /dev/sdb
    2     2.00GiB  /dev/sdc
```

 # btrfs filesystem show /dev/sdb

*show basic information about the FS /dev/*sdb and /*dev*/sdc. They have the same UUID but each one has it's own UUID_SUB

```
root@debian-vm:/home/ilan# btrfs filesystem show /dev/sdb
Label: none  uuid: da443907-442e-42d8-a6fe-01bcfd20ce7c
        Total devices 2 FS bytes used 128.00KiB
        devid    1 size 2.00GiB used 417.50MiB path /dev/sdb
        devid    2 size 2.00GiB used 417.50MiB path /dev/sdc

root@debian-vm:/home/ilan# btrfs filesystem show /dev/sdc
Label: none  uuid: da443907-442e-42d8-a6fe-01bcfd20ce7c
        Total devices 2 FS bytes used 128.00KiB
        devid    1 size 2.00GiB used 417.50MiB path /dev/sdb
        devid    2 size 2.00GiB used 417.50MiB path /dev/sdc

root@debian-vm:/home/ilan# /sbin/blkid /dev/sdb
/dev/sdb: UUID="da443907-442e-42d8-a6fe-01bcfd20ce7c" UUID_SUB="09b762ff-27d9-467f-9930-2562ff17071e
" TYPE="btrfs"
root@debian-vm:/home/ilan#
root@debian-vm:/home/ilan# /sbin/blkid /dev/sdc
/dev/sdc: UUID="da443907-442e-42d8-a6fe-01bcfd20ce7c" UUID_SUB="8292ab72-3a99-4334-9384-45ffa2180b0b
" TYPE="btrfs"
root@debian-vm:/home/ilan#
```

MOUNTING THE NEW FS:

mkdir /NAS

mount /dev/sdb /NAS

 # df -h - doesn't show the true\real value of the free space. Use this command:

btrfs filesystem df /NAS

is the correct way to show the actual free space

btrfs filesystem usage /NAS

Show more detail information about usage and free space
- Device size: 4GB
- Alocated: 835MB
- Unalocated: 3.18GB
- DATA is in RAID0, size 409MB, use 128KB
- METADATA is in RAID1, size 204MB, use 112KB
- SYSTEM is in RAID1, size 8MB, use 16KB
- UNALOCATED: /dev/sdb and /dev/sdc 1.59GB each
- The DATA space will be increase (and compress) automatically when copying data on it

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SNAPPER: managing snapshots tool

- Create\Delete snaps based on time
- Making snaps automatically before updating the system (apt upgrade)
- Restore particular files – not restore to whole snapshot

snapper -c nas create-config /NAS

- -c: config name
- cancel hourly snapping: "TIMELINE_CREATE = "no" in /etc/snapper/configs/nas

snapper -c nas create

- create new snapshot

snapper -c nas list

- list of snaps for 'nas' config

snapper -c nas create

- create new snap after deleting some files

snapper -c nas1 delete 11
snapper -c nas1 delete 11, 15

- delete snap 11, delete snap 11 and 15

snapper -c nas status 3..4

- compare backup 3 and 4

snapper -c nas undochange 3..4

- cancel changing between snap 3 and 4

snapper -c nas undochange 3..4 /*NAS*/file1

- cancel changing of file1 between snap 3 and 4

snapper -c nas diff 3..4 /*NAS*/file1

- show diff of file1 between snap3 and snap 4

 # snapper -c nas delete-config

- delete 'nas' config with the whole snapshots

Add device to RAID

btrfs device add -f /dev/sdx /NAS

- -f force

- This does not enterning the device to the raid

btrfs fi balance start -dconvert=raid0 -mconvert=raid0 /NAS

- balance add the device to the raid array

- -dconvert: -d for data (you ran choose rain0, raid1, raid5, raid10)

- -mconvert: -m for metadata

 # btrfs fi balance start /NAS

- it will balance the raid if you suspect of something wrong

SCRUB

btrfs scrub start /NAS

- btrfs is a self healing FS. If btrfs see a problem it will automatically fix it

 # btrfs scrub status /NAS

- To see the status of scrub command (that run as a process in the background)