

Lab4

1. list all available disks and partitions ?

```
hanaahmed@localhost:~$ fdisk -l
fdisk: cannot open /dev/sda: Permission denied
fdisk: cannot open /dev/mapper/cs-root: Permission denied
fdisk: cannot open /dev/mapper/cs-swap: Permission denied
hanaahmed@localhost ~]$ sudo fdisk -l
[sudo] password for hanaahmed:
Disk /dev/sda: 20 GiB, 21474836480 bytes, 41943040 sectors
Disk model: VMware Virtual S
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xe4887993

Device      Boot  Start      End  Sectors  Size Id Type
/dev/sda1   *      2048    2099199   2097152    1G 83 Linux
/dev/sda2                2099200 41943039 39843840   19G 8e Linux LVM

Disk /dev/mapper/cs-root: 17 GiB, 18249416704 bytes, 35643392 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
hanaahmed@localhost ~]$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   20G  0 disk
├─sda1       8:1    0    1G  0 part /boot
└─sda2       8:2    0   19G  0 part
   └─cs-root 253:0    0   17G  0 lvm  /
      └─cs-swap 253:1    0    2G  0 lvm  [SWAP]
sr0         11:0    1 158.4M  0 rom  /run/media/hanaahmed/CDROM
sr1         11:1    1  10.9G  0 rom  /run/media/hanaahmed/CentOS-Stream-9-BaseOS-x86_64
hanaahmed@localhost ~]$
```

2. create a new GPT partition table on /dev/sdb?

```
hanaahmed@localhost:~  
[hanaahmed@localhost ~]$ lsblk  
NAME MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS  
sda   8:0    0   20G  0 disk  
├─sda1  
│   8:1    0    1G  0 part /boot  
└─sda2  
    8:2    0   19G  0 part  
    ├─cs-root  
    │ 253:0  0   17G  0 lvm  /  
    └─cs-swap  
        253:1  0    2G  0 lvm  [SWAP]  
sdb   8:16   0   10G  0 disk  
sr0   11:0   1 158.4M  0 rom   /run/media/hanaahmed/CDROM  
sr1   11:1   1  10.9G  0 rom   /run/media/hanaahmed/CentOS-Stream-9-BaseOS-x86_64  
[hanaahmed@localhost ~]$
```

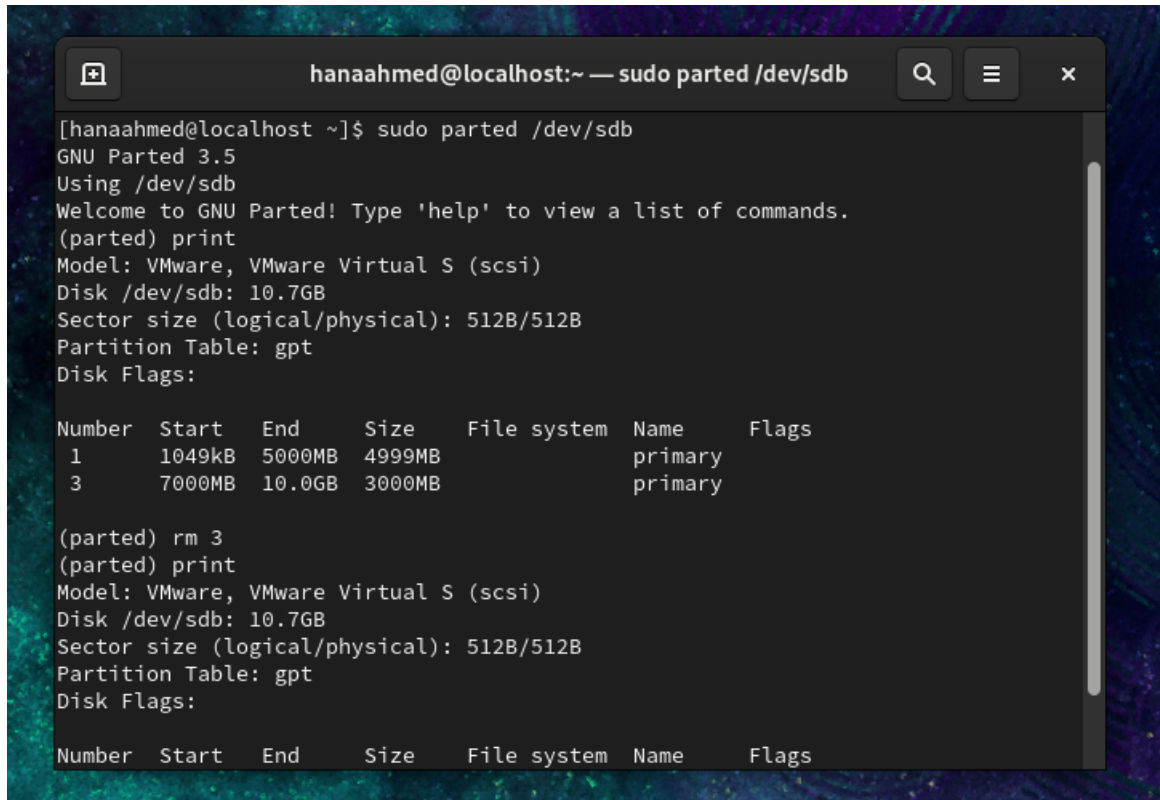
3. create a 3 partitions on /dev/sdb?

```
hanaahmed@localhost:~ — sudo parted /dev/sdb  
[hanaahmed@localhost ~]$ sudo parted /dev/sdb  
[sudo] password for hanaahmed:  
GNU Parted 3.5  
Using /dev/sdb  
Welcome to GNU Parted! Type 'help' to view a list of commands.  
(parted) unit GB  
(parted) mkpart primary ext4 0 5  
Error: /dev/sdb: unrecognised disk label  
(parted) mklabel gpt  
(parted) mkpart primary ext4 0 5  
(parted) mkpart primary ext4 5 7  
(parted) mkpart primary ext4 7 10  
(parted) print  
Model: VMware, VMware Virtual S (scsi)  
Disk /dev/sdb: 10.7GB  
Sector size (logical/physical): 512B/512B  
Partition Table: gpt  
Disk Flags:  


| Number | Start  | End    | Size   | File system | Name    | Flags |
|--------|--------|--------|--------|-------------|---------|-------|
| 1      | 0.00GB | 5.00GB | 5.00GB | ext4        | primary |       |
| 2      | 5.00GB | 7.00GB | 2.00GB | ext4        | primary |       |
| 3      | 7.00GB | 10.0GB | 3.00GB | ext4        | primary |       |


```

4. remove a partition 2 and 3 ?



```
hanaahmed@localhost:~ — sudo parted /dev/sdb
[hanaahmed@localhost ~]$ sudo parted /dev/sdb
GNU Parted 3.5
Using /dev/sdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) print
Model: VMware, VMware Virtual S (scsi)
Disk /dev/sdb: 10.7GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name     Flags
  1      1049kB  5000MB  4999MB             primary
  3      7000MB  10.0GB  3000MB             primary

(parted) rm 3
(parted) print
Model: VMware, VMware Virtual S (scsi)
Disk /dev/sdb: 10.7GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name     Flags
  1      1049kB  5000MB  4999MB             primary
```

5. check the partition table type of a disk?

(parted) print

Model: VMware, VMware Virtual S (scsi)

Disk /dev/sdb: 10.7GB

Sector size (logical/physical): 512B/512B

Partition Table: gpt

Disk Flags:

Number	Start	End	Size	File system	Name	Flags
1	1049kB	5000MB	4999MB		primary	

6. format a new partition with ext4 and mount it?

```
hanaahmed@localhost:~  
[hanaahmed@localhost ~]$ mkfs.ext4 /dev/sdb1  
mke2fs 1.46.5 (30-Dec-2021)  
mkfs.ext4: Permission denied while trying to determine filesystem size  
[hanaahmed@localhost ~]$ sudo mkfs.ext4 /dev/sdb1  
[sudo] password for hanaahmed:  
mke2fs 1.46.5 (30-Dec-2021)  
Creating filesystem with 1220352 4k blocks and 305216 inodes  
Filesystem UUID: 50bf63e2-057f-47ff-b79d-0fadaba707b3  
Superblock backups stored on blocks:  
        32768, 98304, 163840, 229376, 294912, 819200, 884736  
  
Allocating group tables: done  
Writing inode tables: done  
Creating journal (16384 blocks): done  
Writing superblocks and filesystem accounting information: done  
  
[hanaahmed@localhost ~]$ mkdir /mnt/disk-test  
mkdir: cannot create directory '/mnt/disk-test': Permission denied  
[hanaahmed@localhost ~]$ sudo mkdir /mnt/disk-test  
[hanaahmed@localhost ~]$ mount /dev/sdb1 /mnt/disk-test  
mount: /mnt/disk-test: must be superuser to use mount.  
[hanaahmed@localhost ~]$ sudo mount /dev/sdb1 /mnt/disk-test  
[hanaahmed@localhost ~]$
```

7. convert an GPT disk to MBR ?

```
Writing inode tables: done  
Creating journal (16384 blocks): done  
Writing superblocks and filesystem accounting information: done  
  
[hanaahmed@localhost ~]$ mkdir /mnt/disk-test  
mkdir: cannot create directory '/mnt/disk-test': Permission denied  
[hanaahmed@localhost ~]$ sudo mkdir /mnt/disk-test  
[hanaahmed@localhost ~]$ mount /dev/sdb1 /mnt/disk-test  
mount: /mnt/disk-test: must be superuser to use mount.  
[hanaahmed@localhost ~]$ sudo mount /dev/sdb1 /mnt/disk-test  
[hanaahmed@localhost ~]$ sudo parted /dev/sdb mklabel msdos  
Warning: Partition(s) on /dev/sdb are being used.  
Ignore/Cancel? ignore  
Warning: The existing disk label on /dev/sdb will be destroyed and all data on  
this disk will be lost. Do you want to continue?  
Yes/No? yes  
Error: Partition(s) 1 on /dev/sdb have been written, but we have been unable to  
inform the kernel of the change, probably because it/they are in use. As a  
result, the old partition(s) will remain in use. You should reboot now before  
making further changes.  
Ignore/Cancel? ignore  
Information: You may need to update /etc/fstab.  
[hanaahmed@localhost ~]$
```

8. create a 3 Primary partitions and 1 Extended on /dev/sdb?

```
[hanaahmed@localhost ~]$ sudo parted /dev/sdb mkpart primary ext4 1MiB 500MiB
[hanaahmed@localhost ~]$ sudo parted /dev/sdb mkpart primary ext4 500MiB 1GiB
[hanaahmed@localhost ~]$ sudo parted /dev/sdb mkpart primary ext4 1GiB 7GiB
[hanaahmed@localhost ~]$ sudo parted /dev/sdb mkpart extended ext4 7GiB
10GiB
```

9. create a physical volume (PV) on a newly added virtual disks?

```
[hanaahmed@localhost ~]$ sudo pvcreate /dev/sdb
WARNING: dos signature detected on /dev/sdb at offset 510. Wipe it? [y/n]: y
Wiping dos signature on /dev/sdb.
Physical volume "/dev/sdb" successfully created.
[hanaahmed@localhost ~]$
```

- 10.create a volume group (VG) using multiple physical volumes?

```
[hanaahmed@localhost ~]$ sudo vgcreate new-volume /dev/sdb

Volume group "new-volume" successfully created
```

- 11.create a logical volume (LV) of a specific size?

```
[hanaahmed@localhost ~]$ sudo lvcreate -L 2G -n log-volume new-volume
```

```
[sudo] password for hanaahmed:
```

```
WARNING: ext4 signature detected on /dev/new-volume/log-volume at offset 1080. Wipe
it? [y/n]: y
```

```
Wiping ext4 signature on /dev/new-volume/log-volume.
```

```
Logical volume "log-volume" created.
```

```
[hanaahmed@localhost ~]$
```

- 12.check the available free space in a volume group?


```
Logical volume "log-volume" created.
[hanaahmed@localhost ~]$ sudo vgdisplay new-volume
--- Volume group ---
VG Name                new-volume
System ID
Format                 lvm2
Metadata Areas         1
Metadata Sequence No   2
VG Access               read/write
VG Status               resizable
MAX LV                 0
Cur LV                 1
Open LV                 0
Max PV                  0
Cur PV                 1
Act PV                  1
VG Size                 <10.00 GiB
PE Size                 4.00 MiB
Total PE                2559
Alloc PE / Size         512 / 2.00 GiB
Free PE / Size          2047 / <8.00 GiB
VG UUID                 gx1LLi-AXEf-Iqf6-bqKk-PzS3-aMOE-PMQiqP
[hanaahmed@localhost ~]$
```

13.format and mount a logical volume in Linux?

```
[hanaahmed@localhost ~]$ sudo mkfs.ext4 /dev/new-volume/log-volume
```

mkfs2fs 1.46.5 (30-Dec-2021)

Creating filesystem with 524288 4k blocks and 131072 inodes

Filesystem UUID: ffbd788b-27dc-41ca-9e79-543783512def

Superblock backups stored on blocks:

32768, 98304, 163840, 229376, 294912

Allocating group tables: done

Writing inode tables: done

Creating journal (16384 blocks): done

Writing superblocks and filesystem accounting information: done

```
[hanaahmed@localhost ~]$ sudo mkdir /mnt/log-volume
```

```
[hanaahmed@localhost ~]$ sudo mount /dev/new-volume/log-volume /mnt/log-volume
```

```
[hanaahmed@localhost ~]$
```

14.added a new 1GB virtual disk to your VM. How do you add it to LVM storage?

```
[hanaahmed@localhost ~]$ sudo pvcreate /dev/sdc
```

```
[sudo] password for hanaahmed:
```

Physical volume "/dev/sdc" successfully created.

```
[hanaahmed@localhost ~]$ sudo vgextend new-volume /dev/sdc
```

Volume group "new-volume" successfully extended

15.Your application requires more storage. How do you extend an existing logical volume by 500MB?

```
[hanaahmed@localhost ~]$ sudo lvextend -L +500M /dev/new-volume/log-volume
```

Size of logical volume new-volume/log-volume changed from 2.00 GiB (512 extents) to <2.49 GiB (637 extents).

Logical volume new-volume/log-volume successfully resized.

16.Reduce an existing logical volume by 200MB?

```
[hanaahmed@localhost ~]$ sudo umount /dev/new-volume/log-volume
```

```
[hanaahmed@localhost ~]$ sudo lvreduce -L -200M /dev/new-volume/log-volume
```

File system ext4 found on new-volume/log-volume.

File system size (2.00 GiB) is smaller than the requested size (2.29 GiB).

File system reduce is not needed, skipping.

Size of logical volume new-volume/log-volume changed from <2.49 GiB (637 extents) to 2.29 GiB (587 extents).

Logical volume new-volume/log-volume successfully resized.

```
[hanaahmed@localhost ~]$ sudo mount /dev/new-volume/log-volume /mnt/log-volume
```

17.remove a logical volume safely?

```
[hanaahmed@localhost ~]$ sudo umount /dev/new-volume/log-volume
```

```
[hanaahmed@localhost ~]$ sudo lvremove /dev/new-volume/log-volume
```

Do you really want to remove active logical volume new-volume/log-volume? [y/n]: y

Logical volume "log-volume" successfully removed.

18.remove a volume group?

```
[hanaahmed@localhost ~]$ sudo vgremove new-volume
```

Volume group "new-volume" successfully removed