Seif Hendawy
RHCSA II Day 4

1. list all available disks and partitions ?

```
seif@172:~$ lsblk
NAME             MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sr0               11:0    1  7.1G  0 rom  /run/media/seif/CentOS-Stream-10-BaseOS-x86_64
nvme0n1          259:0    0   25G  0 disk
├─nvme0n1p1      259:1    0    1M  0 part
├─nvme0n1p2      259:2    0    1G  0 part /boot
└─nvme0n1p3      259:3    0   19G  0 part
  ├─cs_172-root 253:0    0   17G  0 lvm  /
  └─cs_172-swap 253:1    0    2G  0 lvm  [SWAP]
seif@172:~$
```

```
seif@172:~$ lsblk
NAME             MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sr0               11:0    1  7.1G  0 rom  /run/media/seif/CentOS-Stream-10-BaseOS-x86_64
nvme0n1          259:0    0    1G  0 disk
nvme0n2          259:1    0   25G  0 disk
├─nvme0n2p1      259:2    0    1M  0 part
├─nvme0n2p2      259:3    0    1G  0 part /boot
└─nvme0n2p3      259:4    0   19G  0 part
  ├─cs_172-root 253:0    0   17G  0 lvm  /
  └─cs_172-swap 253:1    0    2G  0 lvm  [SWAP]
seif@172:~$
```

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

```
seif@172:~$ sudo parted /dev/nvme0n1 mklabel gpt
[sudo] password for seif:
Information: You may need to update /etc/fstab.
```

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

```
seif@172:~$ sudo parted /dev/nvme0n1 mkpart primary ext4 0% 33%
Information: You may need to update /etc/fstab.

seif@172:~$ sudo parted /dev/nvme0n1 mkpart primary ext4 33% 66%
Information: You may need to update /etc/fstab.

seif@172:~$ sudo parted /dev/nvme0n1 mkpart primary ext4 66% 100%
Information: You may need to update /etc/fstab.

seif@172:~$ lsblk /dev/nvme0n1
NAME          MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
nvme0n1       259:0    0   1G  0 disk
├─nvme0n1p2 259:5    0  338M  0 part
├─nvme0n1p1 259:6    0  337M  0 part
└─nvme0n1p3 259:7    0  347M  0 part
seif@172:~$
```

4. remove a partition 2 and 3 ?

```
seif@172:~$ sudo parted /dev/nvme0n1 rm 2
Information: You may need to update /etc/fstab.

seif@172:~$ sudo parted /dev/nvme0n1 rm 3
Information: You may need to update /etc/fstab.

seif@172:~$ lsblk /dev/nvme0n1
NAME          MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
nvme0n1       259:0    0   1G  0 disk
└─nvme0n1p1 259:5    0  337M  0 part
seif@172:~$
```

5. check the partition table type of a disk?

```
seif@172:~$ sudo parted /dev/nvme0n1 print
Model: VMware Virtual NVMe Disk (nvme)
Disk /dev/nvme0n1: 1074MB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start    End     Size    File system  Name      Flags
 1      1049kB  354MB   353MB                 primary
```

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

```
seif@172:~$ sudo mkfs.ext4 /dev/nvme0n1p1
mke2fs 1.47.1 (20-May-2024)
Creating filesystem with 345088 1k blocks and 86344 inodes
Filesystem UUID: c7345e87-b7a2-4a65-af73-b3e29a8215f9
Superblock backups stored on blocks:
        8193, 24577, 40961, 57345, 73729, 204801, 221185

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

seif@172:~$ sudo mkdir -p /mnt/part1
seif@172:~$ sudo mount /dev/nvme0n1p1 /mnt/part1
seif@172:~$ 
```

< >   CentOS Stream / mnt

hgfs   part1
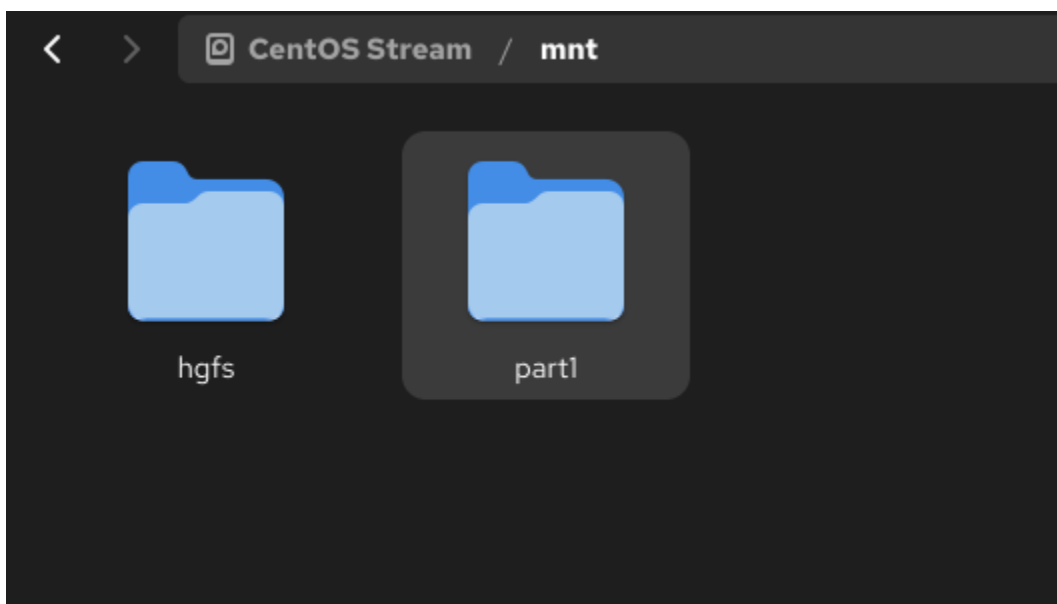
7. convert an GPT disk to MBR ?

```
seif@172:~$ sudo parted /dev/nvme0n1 mklabel msdos
Warning: Partition(s) on /dev/nvme0n1 are being used.
Ignore/Cancel? c
seif@172:~$ sudo unmount /dev/nvme0n1p1 /mnt/part1
sudo: unmount: command not found
seif@172:~$ sudo umount /dev/nvme0n1p1 /mnt/part1
umount: /mnt/part1: not mounted.
seif@172:~$ sudo parted /dev/nvme0n1 mklabel msdos
Warning: The existing disk label on /dev/nvme0n1 will be destroyed and all data on this disk will be lost. Do you want to continue?
Yes/No? yes
Information: You may need to update /etc/fstab.

seif@172:~$ sudo parted /dev/nvme0n1 print
Model: VMware Virtual NVMe Disk (nvme)
Disk /dev/nvme0n1: 1074MB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start  End  Size  Type  File system  Flags
```

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

```
seif@172:~$ sudo parted /dev/nvme0n1 mkpart primary ext4 0% 25%
Information: You may need to update /etc/fstab.

seif@172:~$ sudo parted /dev/nvme0n1 mkpart primary ext4 25% 50%
Information: You may need to update /etc/fstab.

seif@172:~$ sudo parted /dev/nvme0n1 mkpart primary ext4 50% 75%
Information: You may need to update /etc/fstab.

seif@172:~$ sudo parted /dev/nvme0n1 mkpart extended ext4 75% 100
Error: Invalid number.
seif@172:~$ sudo parted /dev/nvme0n1 mkpart extended 75% 100%
Information: You may need to update /etc/fstab.

seif@172:~$ lsblk /dev/nvme0n1
NAME          MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
nvme0n1       259:0    0    1G  0 disk
├─nvme0n1p4 259:5    0    1K  0 part
├─nvme0n1p1 259:8    0  255M  0 part
├─nvme0n1p2 259:9    0  256M  0 part
└─nvme0n1p3 259:10   0  256M  0 part
seif@172:~$ 
```

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

```
seif@172:~$ sudo pvcreate /dev/nvme0n1
WARNING: dos signature detected on /dev/nvme0n1 at offset 510. Wipe it? [y/n]: y
  Wiping dos signature on /dev/nvme0n1.
  Physical volume "/dev/nvme0n1" successfully created.
seif@172:~$ sudo pvs
  PV             VG Fmt  Attr PSize PFree
  /dev/nvme0n1      lvm2 --- 1.00g 1.00g
seif@172:~$ ▯
```

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

```
seif@172:~$ sudo vgcreate lab4 /dev/nvme0n1
  Volume group "lab4" successfully created
seif@172:~$ sudo vgs
  VG   #PV #LV #SN Attr   VSize    VFree
  lab4   1   0   0 wz--n- 1020.00m 1020.00m
seif@172:~$ ▯
```

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

```
seif@172:~$ sudo lvcreate -L 250M -n lab4_lv lab4
  Rounding up size to full physical extent 252.00 MiB
WARNING: ext4 signature detected on /dev/lab4/lab4_lv at offset 1080. Wipe it? [y/n]: y
  Wiping ext4 signature on /dev/lab4/lab4_lv.
  Logical volume "lab4_lv" created.
seif@172:~$ sudo lvs
  LV      VG   Attr       LSize   Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
  lab4_lv lab4 -wi-a----- 252.00m
```

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

```
seif@172:~$ sudo vgdisplay lab4
  --- Volume group ---
  VG Name               lab4
  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               1020.00 MiB
  PE Size               4.00 MiB
  Total PE              255
  Alloc PE / Size       63 / 252.00 MiB
  Free  PE / Size       192 / 768.00 MiB
  VG UUID               oBsLt7-Jaug-VY3Z-c1JL-FQ7y-gV1O-JPWfAf
```

13. format and mount a logical volume in Linux?

```
seif@172:~$ sudo mkfs.ext4 /dev/lab4/lab4_lv
mke2fs 1.47.1 (20-May-2024)
Creating filesystem with 258048 1k blocks and 64512 inodes
Filesystem UUID: 92f54040-383a-45ce-b33b-968f10370fc7
Superblock backups stored on blocks:
        8193, 24577, 40961, 57345, 73729, 204801, 221185

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

seif@172:~$ sudo mkdir -p /mnt/lab_lv
seif@172:~$ sudo mount /dev/lab4/lab4_lv /mnt/
hgfs/   lab_lv/ part1/
seif@172:~$ sudo mount /dev/lab4/lab4_lv /mnt/lab_lv/
seif@172:~$ 
```

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

```
seif@172:~$ sudo lsblk
NAME              MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sr0                 11:0    1 7.1G  0 rom  /run/media/seif/CentOS-Stream-10-BaseOS-x86_64
nvme0n1            259:0    0   1G  0 disk
└─lab4-lab4_lv     253:2    0 252M  0 lvm  /mnt/lab_lv
nvme0n2            259:1    0  25G  0 disk
├─nvme0n2p1        259:2    0   1M  0 part
├─nvme0n2p2        259:3    0   1G  0 part /boot
└─nvme0n2p3        259:4    0  19G  0 part
  ├─cs_172-root    253:0    0  17G  0 lvm  /
  └─cs_172-swap    253:1    0   2G  0 lvm  [SWAP]
seif@172:~$
```

```
seif@172:~$ sudo lsblk
NAME              MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sr0                 11:0    1 7.1G  0 rom  /run/media/seif/CentOS-Stream-10-BaseOS-x86_64
nvme0n1            259:0    0  25G  0 disk
├─nvme0n1p1        259:3    0   1M  0 part
├─nvme0n1p2        259:4    0   1G  0 part /boot
└─nvme0n1p3        259:5    0  19G  0 part
  ├─cs_172-root    253:0    0  17G  0 lvm  /
  └─cs_172-swap    253:1    0   2G  0 lvm  [SWAP]
nvme0n2            259:1    0   1G  0 disk
nvme0n3            259:2    0   1G  0 disk
└─lab4-lab4_lv     253:2    0 252M  0 lvm
seif@172:~$
```

```
seif@172:~$ sudo vgextend lab4 /dev/nvme0n2
  Volume group "lab4" successfully extended
seif@172:~$ sudo vgs
  VG   #PV #LV #SN Attr   VSize VFree
  lab4   2   1   0 wz--n- 1.99g <1.75g
seif@172:~$
```

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

```
seif@172:~$ sudo lvextend -L +500M /dev/lab4/lab4_lv
  Size of logical volume lab4/lab4_lv changed from 252.00 MiB (63 extents) to 752.00 MiB (188 extents).
  Logical volume lab4/lab4_lv successfully resized.
seif@172:~$ sudo resize2fs /dev/lab4/lab4_lv
resize2fs 1.47.1 (20-May-2024)
Please run 'e2fsck -f /dev/lab4/lab4_lv' first.

seif@172:~$ e2fsck -f /dev/lab4/lab4_lv
e2fsck 1.47.1 (20-May-2024)
e2fsck: Permission denied while trying to open /dev/lab4/lab4_lv
You must have r/w access to the filesystem or be root
seif@172:~$ sudo e2fsck -f /dev/lab4/lab4_lv
e2fsck 1.47.1 (20-May-2024)
Pass 1: Checking inodes, blocks, and sizes
Pass 2: Checking directory structure
Pass 3: Checking directory connectivity
Pass 4: Checking reference counts
Pass 5: Checking group summary information
/dev/lab4/lab4_lv: 11/64512 files (0.0% non-contiguous), 22375/258048 blocks
seif@172:~$ sudo resize2fs /dev/lab4/lab4_lv
resize2fs 1.47.1 (20-May-2024)
Resizing the filesystem on /dev/lab4/lab4_lv to 770048 (1k) blocks.
The filesystem on /dev/lab4/lab4_lv is now 770048 (1k) blocks long.

seif@172:~$ sudo lvs
  LV      VG   Attr       LSize   Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
  lab4_lv lab4 -wi-a----- 752.00m
seif@172:~$ █
```

16. Reduce an existing logical volume by 200MB?

```
seif@172:~$ sudo e2fsck -f /dev/lab4/lab4_lv
e2fsck 1.47.1 (20-May-2024)
Pass 1: Checking inodes, blocks, and sizes
Pass 2: Checking directory structure
Pass 3: Checking directory connectivity
Pass 4: Checking reference counts
Pass 5: Checking group summary information
/dev/lab4/lab4_lv: 11/48192 files (0.0% non-contiguous), 7506/192512 blocks
seif@172:~$ sudo resize2fs /dev/lab4/lab4_lv 552M
resize2fs 1.47.1 (20-May-2024)
Resizing the filesystem on /dev/lab4/lab4_lv to 141312 (4k) blocks.
The filesystem on /dev/lab4/lab4_lv is now 141312 (4k) blocks long.

seif@172:~$ sudo lvreduce -L 552M /dev/lab4/lab4_lv
  File system ext4 found on lab4/lab4_lv.
  File system size (552.00 MiB) is equal to the requested size (552.00 MiB).
  File system reduce is not needed, skipping.
  Size of logical volume lab4/lab4_lv changed from 752.00 MiB (188 extents) to 552.00 MiB (138 extents).
  Logical volume lab4/lab4_lv successfully resized.
seif@172:~$ sudo resize2fs /dev/lab4/lab4_lv
resize2fs 1.47.1 (20-May-2024)
The filesystem is already 141312 (4k) blocks long.  Nothing to do!

seif@172:~$ sudo lvs
  LV      VG   Attr       LSize   Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
  lab4_lv lab4 -wi-a----- 552.00m
seif@172:~$
```

17. remove a logical volume safely?

```
seif@172:~$ sudo lvremove /dev/lab4/lab4_lv
Do you really want to remove active logical volume lab4/lab4_lv? [y/n]: y
  Logical volume "lab4_lv" successfully removed.
seif@172:~$ sudo lvs
seif@172:~$
```

18. remove a volume group?

```
seif@172:~$ sudo vgremove lab4
  Volume group "lab4" successfully removed
seif@172:~$ sudo vgs
seif@172:~$
```