

1. list all available disks and partitions ?

```
[root@centos ~]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   10G  0 disk
├─sda1       8:1    0  100M  0 part /boot/efi
└─sda2       8:2    0   3.9G  0 part /
sdb          8:16   0   4.9G  0 disk
```

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

```
[root@centos ~]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   10G  0 disk
├─sda1       8:1    0  100M  0 part /boot/efi
└─sda2       8:2    0   3.9G  0 part /
sdb          8:16   0   4.9G  0 disk
[root@centos ~]# parted /dev/sdb
GNU Parted 3.5
Using /dev/sdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) mklabel gpt
(parted) print
Model: QEMU QEMU HARDDISK (scsi)
Disk /dev/sdb: 5268MB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start  End  Size  File system  Name  Flags
```

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

```
[root@centos ~]# sudo parted /dev/sdb
GNU Parted 3.5
Using /dev/sdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) mkpart primary ext4 0% 33%
(parted) mkpart primary ext4 33% 66%
(parted) mkpart primary ext4 66% 100%
(parted) print
```

```
[root@centos ~]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   10G  0 disk
├─sda1       8:1    0  100M  0 part /boot/efi
└─sda2       8:2    0   3.9G  0 part /
sdb          8:16   0   4.9G  0 disk
├─sdb1       8:17   0   1.6G  0 part
├─sdb2       8:18   0   1.6G  0 part
└─sdb3       8:19   0   1.7G  0 part
```

4. remove a partition 2 and 3 ?

```
[root@centos ~]# sudo parted /dev/sdb
GNU Parted 3.5
Using /dev/sdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) rm 3
(parted) rm 2
(parted) quit
Information: You may need to update /etc/fstab.

[root@centos ~]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   10G  0 disk
├─sda1       8:1    0  100M  0 part /boot/efi
└─sda2       8:2    0   3.9G  0 part /
sdb          8:16   0   4.9G  0 disk
└─sdb1       8:17   0   1.6G  0 part
```

5. check the partition table type of a disk?

```
[root@centos ~]# sudo parted /dev/sdb print
Model: QEMU QEMU HARDDISK (scsi)
Disk /dev/sdb: 5268MB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name     Flags
  1      1049kB  1739MB  1737MB                primary
```

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

```
[root@centos ~]# sudo mkfs.ext4 /dev/sdb1
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 424192 4k blocks and 106080 inodes
Filesystem UUID: 06d502e7-df16-4a85-a6ff-c860bdea4799
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912

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

[root@centos ~]# sudo mkdir /mnt/data
[root@centos ~]# sudo mount /dev/sdb1 /mnt/data
[root@centos ~]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda           8:0    0   10G  0 disk
├─sda1        8:1    0  100M  0 part /boot/efi
└─sda2        8:2    0   3.9G  0 part /
sdb           8:16   0   4.9G  0 disk
└─sdb1        8:17   0   1.6G  0 part /mnt/data
[root@centos ~]# df -h /mnt/data
Filesystem      Size  Used Avail Use% Mounted on
/dev/sdb1        1.6G   24K  1.5G   1% /mnt/data
```

7. convert an GPT disk to MBR ?

```
[root@centos ~]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda           8:0    0   10G  0 disk
├─sda1        8:1    0  100M  0 part /boot/efi
└─sda2        8:2    0   3.9G  0 part /
sdb           8:16   0   4.9G  0 disk
└─sdb1        8:17   0   1.6G  0 part /mnt/data
[root@centos ~]# sudo umount /mnt/data
[root@centos ~]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda           8:0    0   10G  0 disk
├─sda1        8:1    0  100M  0 part /boot/efi
└─sda2        8:2    0   3.9G  0 part /
sdb           8:16   0   4.9G  0 disk
└─sdb1        8:17   0   1.6G  0 part
[root@centos ~]# sudo parted /dev/sdb
GNU Parted 3.5
Using /dev/sdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) mklabel msdos
Warning: The existing disk label on /dev/sdb will be destroyed
Yes/No? Yes
(parted) print
Model: QEMU QEMU HARDDISK (scsi)
Disk /dev/sdb: 5268MB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:
```

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

```
Command (m for help): n
Partition type
   p   primary (1 primary, 0 extended, 3 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (2-4, default 2): 2
First sector (1026048-10289151, default 1026048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (1026048-10289151, default 1026048-10289151):

Created a new partition 2 of type 'Linux' and of size 500 MiB.

Command (m for help): p
Disk /dev/sdb: 4.91 GiB, 5268045824 bytes, 10289152 sectors
Disk model: QEMU HARDDISK
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: 0xde9671db
```

```
Command (m for help): n
Partition type
   p   primary (2 primary, 0 extended, 2 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (3,4, default 3): 3
First sector (2050048-10289151, default 2050048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2050048-10289151, default 2050048-10289151):

Created a new partition 3 of type 'Linux' and of size 500 MiB.

Command (m for help): n
Partition type
   p   primary (3 primary, 0 extended, 1 free)
   e   extended (container for logical partitions)
Select (default e): e

Selected partition 4
First sector (3074048-10289151, default 3074048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (3074048-10289151, default 3074048-10289151):

Created a new partition 4 of type 'Extended' and of size 3.4 GiB.
```

```

Command (m for help): p
Disk /dev/sdb: 4.91 GiB, 5268045824 bytes, 10289152 sectors
Disk model: QEMU HARDDISK
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: 0xde9671db

```

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sdb1		2048	1026047	1024000	500M	83	Linux
/dev/sdb2		1026048	2050047	1024000	500M	83	Linux
/dev/sdb3		2050048	3074047	1024000	500M	83	Linux
/dev/sdb4		3074048	10289151	7215104	3.4G	5	Extended

```

Command (m for help):

```

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

```

[root@centos ~]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   10G  0 disk
├─sda1       8:1    0   100M  0 part /boot/efi
└─sda2       8:2    0   3.9G  0 part /
sdb          8:16   0   4.9G  0 disk
├─sdb1       8:17   0   500M  0 part
├─sdb2       8:18   0   500M  0 part
├─sdb3       8:19   0   500M  0 part
└─sdb4       8:20   0    1K  0 part
sdc          8:32   0   4.9G  0 disk
[root@centos ~]# sudo pvcreate /dev/sdc
Physical volume "/dev/sdc" successfully created.
Creating devices file /etc/lvm/devices/system.devices

```

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

```
[root@centos ~]# sudo pvdisplay
"/dev/sdc" is a new physical volume of "<4.91 GiB"
--- NEW Physical volume ---
PV Name                /dev/sdc
VG Name
PV Size                <4.91 GiB
Allocatable           NO
PE Size               0
Total PE              0
Free PE               0
Allocated PE          0
PV UUID               gat0C8-KLuf-51uy-YYqg-KPq0-ZNaS-TGTYgv
```

```
[root@centos ~]# sudo vgcreate my_vg /dev/sdc
Volume group "my_vg" successfully created
[root@centos ~]# sudo vgdisplay my_vg
--- Volume group ---
VG Name                my_vg
System ID
Format                lvm2
Metadata Areas         1
Metadata Sequence No   1
VG Access              read/write
VG Status              resizable
MAX LV                 0
Cur LV                0
Open LV                0
Max PV                 0
Cur PV                1
Act PV                 1
VG Size                4.90 GiB
PE Size                4.00 MiB
Total PE               1255
Alloc PE / Size        0 / 0
Free PE / Size         1255 / 4.90 GiB
VG UUID                NPfqbQ-WkYM-vJbZ-NJRe-CJTs-bQuJ-sdeFjQ
```

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

```

[root@centos ~]# sudo lvcreate -L 1G -n my_lv my_vg
Logical volume "my_lv" created.
[root@centos ~]# sudo lvdisplay /dev/my_vg/my_lv
--- Logical volume ---
LV Path                /dev/my_vg/my_lv
LV Name                 my_lv
VG Name                 my_vg
LV UUID                 6DL6Tg-0ujl-JNYB-LMd7-1y9B-f5Dt-9VW9tT
LV Write Access         read/write
LV Creation host, time centos, 2025-03-28 17:37:18 +0000
LV Status                available
# open                  0
LV Size                 1.00 GiB
Current LE              256
Segments                1
Allocation              inherit
Read ahead sectors      auto
- currently set to     256
Block device            253:0

```

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

```

[root@centos ~]# sudo vgdisplay my_vg
--- Volume group ---
VG Name                 my_vg
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                  4.90 GiB
PE Size                  4.00 MiB
Total PE                 1255
Alloc PE / Size          256 / 1.00 GiB
Free PE / Size           999 / 3.90 GiB
VG UUID                  NPfqBQ-WkYM-vJbZ-NJRe-CJTs-bQuJ-sdeFjQ

```

13. format and mount a logical volume in Linux?

```
[root@centos ~]# sudo mkfs.ext4 /dev/my_vg/my_lv
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 262144 4k blocks and 65536 inodes
Filesystem UUID: 045c7522-5ad0-4d55-b2d6-ba529292b97e
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

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

[root@centos ~]# sudo mkdir /mnt/my_lv
[root@centos ~]# sudo mount /dev/my_vg/my_lv /mnt/my_lv
```

```
[root@centos ~]# lsblk
NAME                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda                  8:0    0   10G  0 disk
├─sda1               8:1    0  100M  0 part /boot/efi
└─sda2               8:2    0   3.9G  0 part /
sdb                  8:16   0   4.9G  0 disk
├─sdb1               8:17   0   500M  0 part
├─sdb2               8:18   0   500M  0 part
├─sdb3               8:19   0   500M  0 part
└─sdb4               8:20   0    1K  0 part
sdc                  8:32   0   4.9G  0 disk
└─my_vg-my_lv       253:0    0    1G  0 lvm  /mnt/my_lv
```

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

```
[root@centos ~]# lsblk
NAME                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda                  8:0    0   10G  0 disk
├─sda1               8:1    0  100M  0 part /boot/efi
└─sda2               8:2    0   3.9G  0 part /
sdb                  8:16   0   4.9G  0 disk
├─sdb1               8:17   0   500M  0 part
├─sdb2               8:18   0   500M  0 part
├─sdb3               8:19   0   500M  0 part
└─sdb4               8:20   0    1K  0 part
sdc                  8:32   0   4.9G  0 disk
└─my_vg-my_lv       253:0    0    1G  0 lvm  /mnt/my_lv
sdd                  8:48   0    1G  0 disk
[root@centos ~]# pvcreate /dev/sdd
Physical volume "/dev/sdd" successfully created.
[root@centos ~]# vgextend my_vg /dev/sdd
Volume group "my_vg" successfully extended
```


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

```
[root@centos ~]# lvextend -L +500M /dev/my_vg/my_lv
Size of logical volume my_vg/my_lv changed from 1.00 GiB (256 extents) to <1.49 GiB (381 extents).
Logical volume my_vg/my_lv successfully resized.
[root@centos ~]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
sda	8:0	0	10G	0	disk	
└─sda1	8:1	0	100M	0	part	/boot/efi
└─sda2	8:2	0	3.9G	0	part	/
sdb	8:16	0	4.9G	0	disk	
└─sdb1	8:17	0	500M	0	part	
└─sdb2	8:18	0	500M	0	part	
└─sdb3	8:19	0	500M	0	part	
└─sdb4	8:20	0	1K	0	part	
sdcc	8:32	0	4.9G	0	disk	
└─my_vg-my_lv	253:0	0	1.5G	0	lvm	/mnt/my_lv

16. Reduce an existing logical volume by 200MB?

```
[root@centos ~]# sudo umount /mnt/my_lv
[root@centos ~]# lvreduce -L -200M /dev/my_vg/my_lv
File system ext4 found on my_vg/my_lv.
File system size (1.00 GiB) is smaller than the requested
File system reduce is not needed, skipping.
Size of logical volume my_vg/my_lv changed from <1.49 GiB
Logical volume my_vg/my_lv successfully resized.
[root@centos ~]# mount /dev/my_vg/my_lv /mnt/my_lv
[root@centos ~]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
sda	8:0	0	10G	0	disk	
└─sda1	8:1	0	100M	0	part	/boot/efi
└─sda2	8:2	0	3.9G	0	part	/
sdb	8:16	0	4.9G	0	disk	
└─sdb1	8:17	0	500M	0	part	
└─sdb2	8:18	0	500M	0	part	
└─sdb3	8:19	0	500M	0	part	
└─sdb4	8:20	0	1K	0	part	
sdcc	8:32	0	4.9G	0	disk	
└─my_vg-my_lv	253:0	0	1.3G	0	lvm	/mnt/my_lv

17. remove a logical volume safely?

```
[root@centos ~]# sudo umount /mnt/my_lv
[root@centos ~]# lvremove /dev/my_vg/my_lv
Do you really want to remove active logical volume my_vg
Logical volume "my_lv" successfully removed.
[root@centos ~]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
sda	8:0	0	10G	0	disk	
└─sda1	8:1	0	100M	0	part	/boot/efi
└─sda2	8:2	0	3.9G	0	part	/
sdb	8:16	0	4.9G	0	disk	
└─sdb1	8:17	0	500M	0	part	
└─sdb2	8:18	0	500M	0	part	
└─sdb3	8:19	0	500M	0	part	
└─sdb4	8:20	0	1K	0	part	
sdcc	8:32	0	4.9G	0	disk	
sdd	8:48	0	1G	0	disk	

```
[root@centos ~]#
```

18. remove a volume group?

```
[root@centos ~]# vgremove my_vg
Volume group "my_vg" successfully removed
[root@centos ~]# pvremove /dev/sdd
Labels on physical volume "/dev/sdd" successfully wiped.
```