**Disk Partition [ fdisk, cfdisk, parted, gparted, lvm ]**

**Introduction**

Disk partitioning is an essential step in managing storage efficiently, allowing me to organize the hard drive into separate sections for different purposes. Tools like fdisk and cfdisk offer command-line simplicity, while parted provides advanced options for resizing and creating partitions. For a more visual approach, gparted makes things even easier with its graphical interface.

**Fdisk**

Fdisk is a dialog-driven program for creation and manipulation of partition tables, easy to create and delete partitions and has various options in it.

*fdisk <device name> (or) fdisk /dev/sda*

**Options :**

m – To list help menu.

p – To print the partition.

n – To create new partition.

d – To delete the partition.

t – To select type of the partition.

w – To write changes to disk.

q – To exit the fdisk.

g – To create new empty GPT partition table.

o – To create new empty MBR (Dos) partition table.

F – To list free unpartitioned space .

v – To verify the partition table.

l – To list available partition types.

**Note :**

**Cfdisk**

Cfdisk is a curses-based program for manipulating any block device, easy to create, delete and resize partitions not the filesystem.

*cfdisk <device name> or cfdisk /dev/sda*

**Options :**

b – To add bootable flag on selected partition.

n – To create new partition.

h – To print the help menu.

d – To delete selected partition.

W – To write changes to disk.

r – To resize the disk partition (only the disk not the filesystem).

q – To exit cfdisk.

Up Arrow – To move the cursor to previous partition.

Down Arrow – To move the cursor to next partition.

Left Arrow – To move the cursor to previous menu item.

Right Arrow – To move the cursor to next menu item .

**Note :**

**Parted**

Parted is a program to manipulate disk partitions, easy to create partitions, deleted partition, resize partitions and copy data to new hard drives and more.

*parted <device name> (or) parted /dev/sda*

**Options :**

help – To display help menu / display help about below commands.

*help <command> (or) help mktable*

mkpart – To create a new disk partition.

mktable – To create new partition table (GPT, MBR, etc).

*mktable <type> (or) mktable gpt*

rm – To delete a partition.

*rm <partition number> (or) rm 1*

print – To print partition details

*print device (or) print free (or) print list (or) print all*

quit – To exit parted program

resizepart – To resize given partition

*resizepart <partition number> <size> (or) resizepart 1 10G*

**Note :**

**Gparted**

Gparted application is a GNOME partition editor for creating, reorganizing and deleting disk partitions as well as reducing the risk of loss of data.

**Note :**

**LVM**

The Logical Volume Manager provides tools to create logical block devices from physical devices. **Volume Group** is a collection of one or more physical devices. Each of these physical devices are called **Physical Group**. A **Logical Group** is a virtual block device that can be used by the system or applications.

**Steps to create LVM**

**1. Create Physical Volume**

*pvcreate <device name> (or) pvcreate /dev/sda*

**Physical Volume Commands**

pvdisplay –

*pvchange –*

*pvremove –*

*pvresize –*

*pvck –*

*pvs –*

*pvscan –*

*pvmove –*

**2. Create Volume Group**

*vgcreate <vg name> <physical volumes > (or)*

*vgcreate volgrp0 /dev/sda3 /dev/sdb*

**Volume Group Commands**

vgdisplay –

vgck –

vgextend –

vgrename –

vgremove –

vgreduce –

vgs –

vgscan –

vgmerge –

vgchange –

vgsplit –

**3. Create Logical Volumes**

*lvcreate --size <size> --name <lv name> <vg name> (or)*

*lvcreate --size 5G --name lv\_root volgrp0*

**Logical Volume Commands**

lvdisplay –

lvs –

lvscan –

lvextend –

lvreduce –

lvrename –

lvremove –

lvresize –

lvchange –

**Note :**

* logical volumes are represented in the device mapper directory (/dev/mapper)

**4. Create Filesystem**

*mkfs.<filesystem type> <device name> (or)*

*mkfs.ext4 /dev/mapper/lv\_root*

**5. Mounting Logical Volume**

*mount <device name> <target directory> (or)*

*mount /dev/mapper/lv\_root /logical\_vol\_folder*