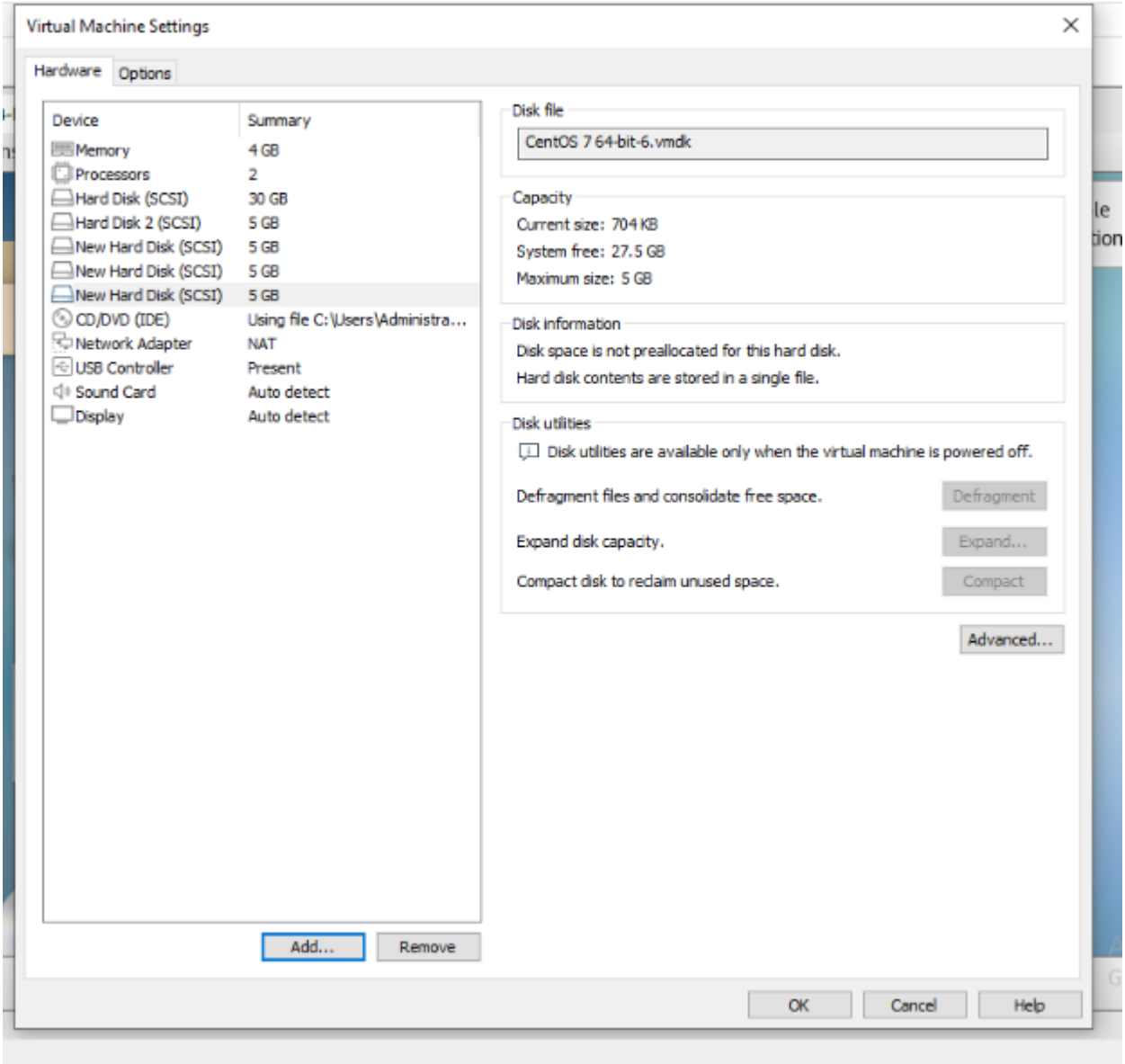
TASK

Attach 3 disks of 5GB each , create 2 Lvms from these disks of 7gb(/lvm1) and 8gb (/lvm2) with xfs and ext4 file systems respectevely . Add another hdd of 4gb and extend 2-2gb on both lvms .

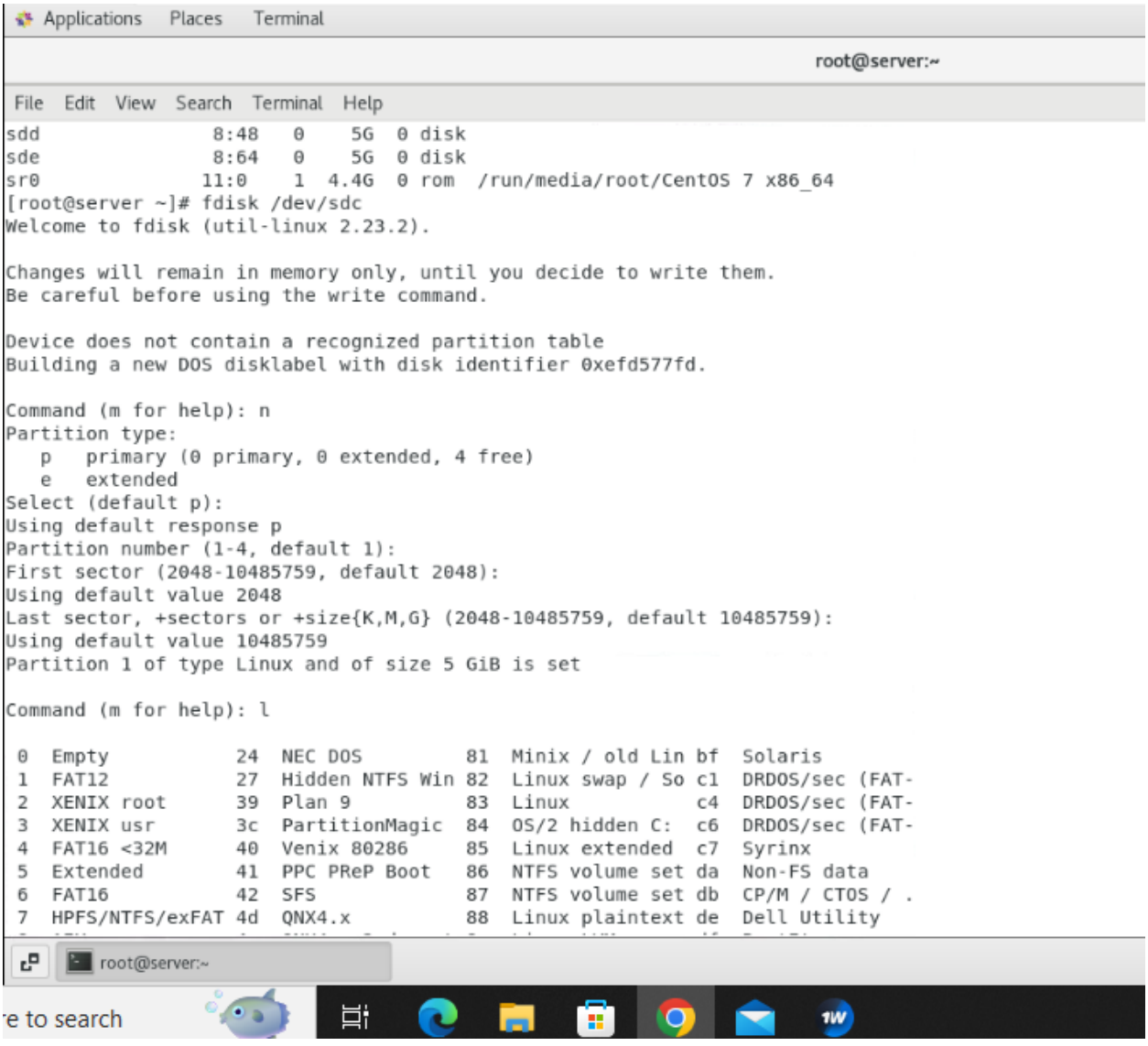
Step 1:

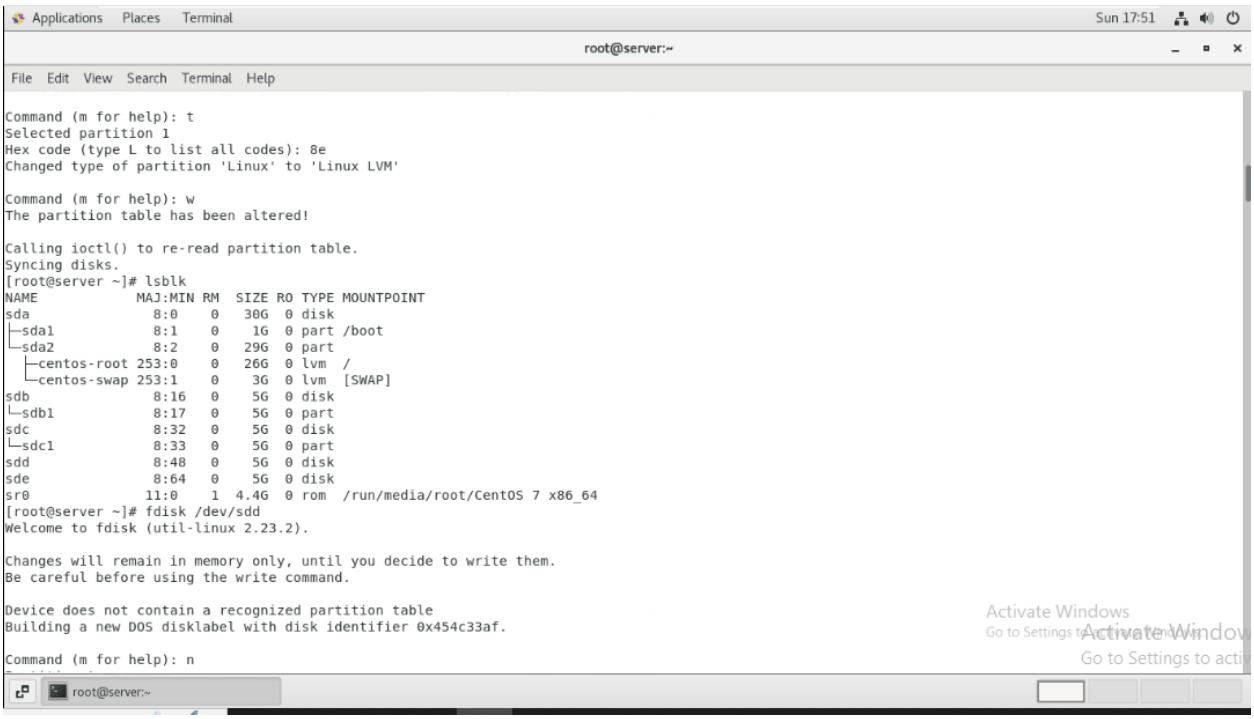
Here adding three 5GB hdd

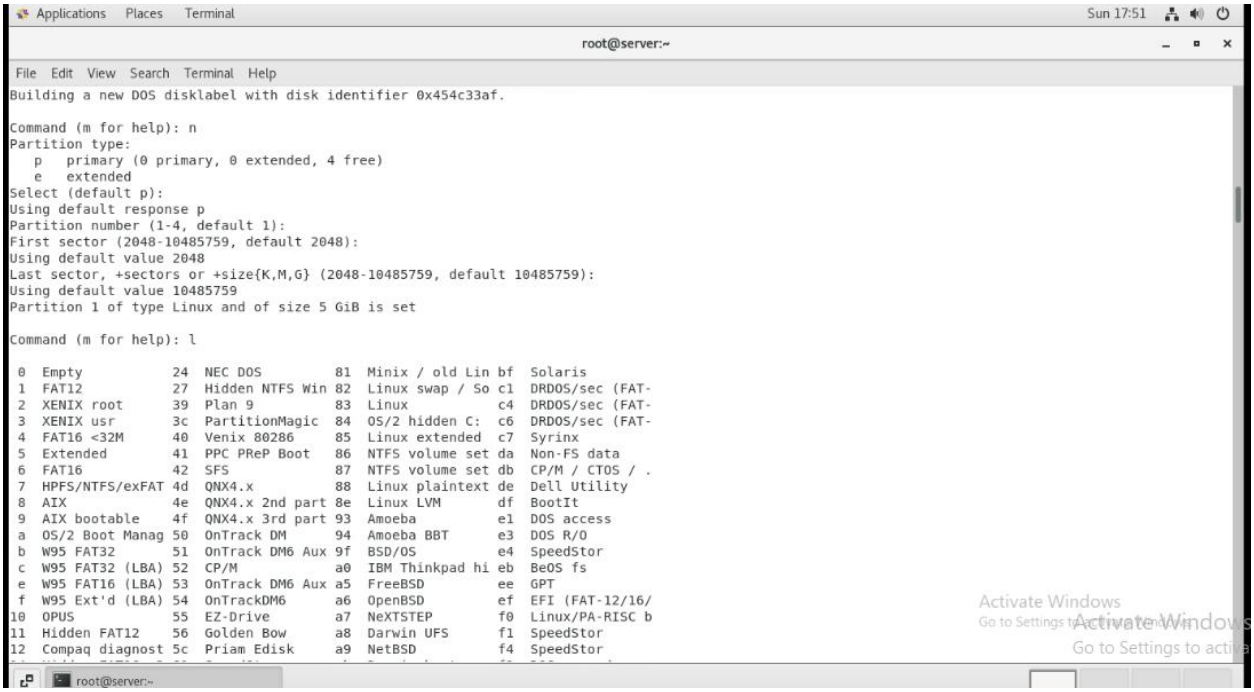


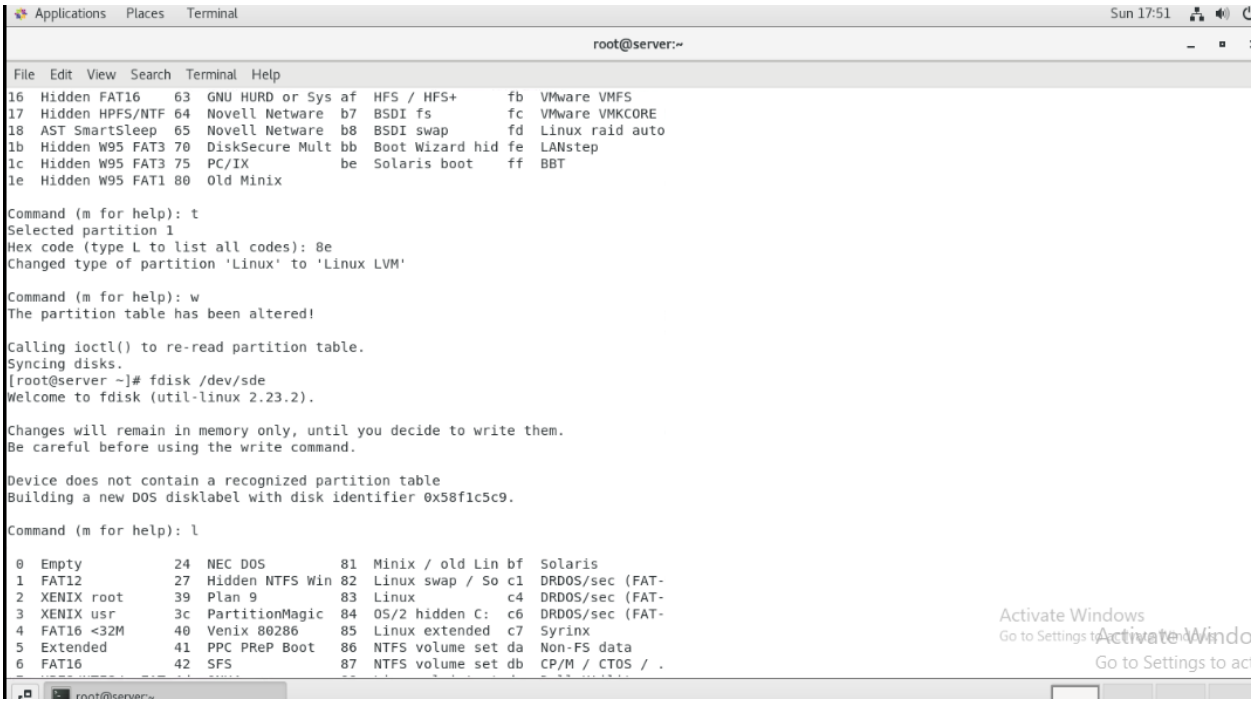
```
[root@server ~]# lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda               8:0    0   30G  0 disk
├─sda1            8:1    0    1G  0 part /boot
└─sda2            8:2    0   29G  0 part
  ├─centos-root 253:0    0   26G  0 lvm  /
  └─centos-swap 253:1    0    3G  0 lvm  [SWAP]
sdb               8:16   0    5G  0 disk
└─sdb1            8:17   0    5G  0 part
sdc               8:32   0    5G  0 disk
sdd               8:48   0    5G  0 disk
sde               8:64   0    5G  0 disk
sr0              11:0    1  4.4G  0 rom  /run/media/root/CentOS 7 x86_64
```

Step2 : creating partition




Applications Places Terminal
Sun 17:51
root@server:~
File Edit View Search Terminal Help
Command (m for help): t
Selected partition 1
Hex code (type L to list all codes): 8e
Changed type of partition 'Linux' to 'Linux LVM'
Command (m for help): w
The partition table has been altered!
Calling ioctl() to re-read partition table.
Syncing disks.
[root@server ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
sda 8:0 0 30G 0 disk
├─sda1 8:1 0 1G 0 part /boot
└─sda2 8:2 0 29G 0 part
├─centos-root 253:0 0 26G 0 lvm /
└─centos-swap 253:1 0 3G 0 lvm [SWAP]
sdb 8:16 0 5G 0 disk
└─sdb1 8:17 0 5G 0 part
sdc 8:32 0 5G 0 disk
└─sdc1 8:33 0 5G 0 part
sdd 8:48 0 5G 0 disk
sde 8:64 0 5G 0 disk
sr0 11:0 1 4.4G 0 rom /run/media/root/CentOS 7 x86_64
[root@server ~]# fdisk /dev/sdd
Welcome to fdisk (util-linux 2.23.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.
Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0x454c33af.
Command (m for help): n
Activate Windows
Go to Settings to activate Windows.
root@server:~


Applications Places Terminal
Sun 17:51
root@server:~
File Edit View Search Terminal Help
Building a new DOS disklabel with disk identifier 0x454c33af.
Command (m for help): n
Partition type:
p primary (0 primary, 0 extended, 4 free)
e extended
Select (default p):
Using default response p
Partition number (1-4, default 1):
First sector (2048-10485759, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-10485759, default 10485759):
Using default value 10485759
Partition 1 of type Linux and of size 5 GiB is set
Command (m for help): l
0 Empty 24 NEC DOS 81 Minix / old Lin bf Solaris
1 FAT12 27 Hidden NTFS Win 82 Linux swap / So c1 DRDOS/sec (FAT-
2 XENIX root 39 Plan 9 83 Linux c4 DRDOS/sec (FAT-
3 XENIX usr 3c PartitionMagic 84 OS/2 hidden C: c6 DRDOS/sec (FAT-
4 FAT16 <32M 40 Venix 80286 85 Linux extended c7 Syrinx
5 Extended 41 PPC PReP Boot 86 NTFS volume set da Non-FS data
6 FAT16 42 SFS 87 NTFS volume set db CP/M / CTOS / .
7 HPFS/NTFS/exFAT 4d QNX4.x 88 Linux plaintext de Dell Utility
8 AIX 4e QNX4.x 2nd part 8e Linux LVM df BootIt
9 AIX bootable 4f QNX4.x 3rd part 93 Amoeba e1 DOS access
a OS/2 Boot Manag 50 OnTrack DM 94 Amoeba BBT e3 DOS R/O
b W95 FAT32 51 OnTrack DM6 Aux 9f BSD/OS e4 SpeedStor
c W95 FAT32 (LBA) 52 CP/M a0 IBM Thinkpad hi eb BeOS fs
e W95 FAT16 (LBA) 53 OnTrack DM6 Aux a5 FreeBSD ee GPT
f W95 Ext'd (LBA) 54 OnTrackDM6 a6 OpenBSD ef EFI (FAT-12/16/
10 OPUS 55 EZ-Drive a7 NeXTSTEP f0 Linux/PA-RISC b
11 Hidden FAT12 56 Golden Bow a8 Darwin UFS f1 SpeedStor
12 Compaq diagnost 5c Priam Edisk a9 NetBSD f4 SpeedStor
Activate Windows
Go to Settings to activate Windows.
root@server:~



Step 3: Create physical Volume

```
[root@server ~]# pvcreate /dev/sdc1 /dev/sdd1 /dev/sde1
  Physical volume "/dev/sdc1" successfully created.
  Physical volume "/dev/sdd1" successfully created.
  Physical volume "/dev/sde1" successfully created.
[root@server ~]# vgcreate vg1 /dev/sdc1 /dev/sdd1 /dev/sde1
  Volume group "vg1" successfully created
[root@server ~]# vgs
  VG     #PV #LV #SN Attr   VSize   VFree
  centos   1   2   0 wz--n- <29.00g      0
  vg1      3   0   0 wz--n- <14.99g <14.99g
```

Step 4 : Create logical volume

```
[root@server ~]# lvcreate -l 50%FREE -n lv1 vg1
  Logical volume "lv1" created.
[root@server ~]# vgs
  VG     #PV #LV #SN Attr   VSize   VFree
  centos   1   2   0 wz--n- <29.00g     0
  vg1      3   1   0 wz--n- <14.99g <7.50g
[root@server ~]# lvcreate -l 100%FREE -n lv2 vg1
  Logical volume "lv2" created.
[root@server ~]# vgs
  VG     #PV #LV #SN Attr   VSize   VFree
  centos   1   2   0 wz--n- <29.00g    0
  vg1      3   2   0 wz--n- <14.99g    0
```

Step 5: create partiton for new logical volumes , lv1 and lv2

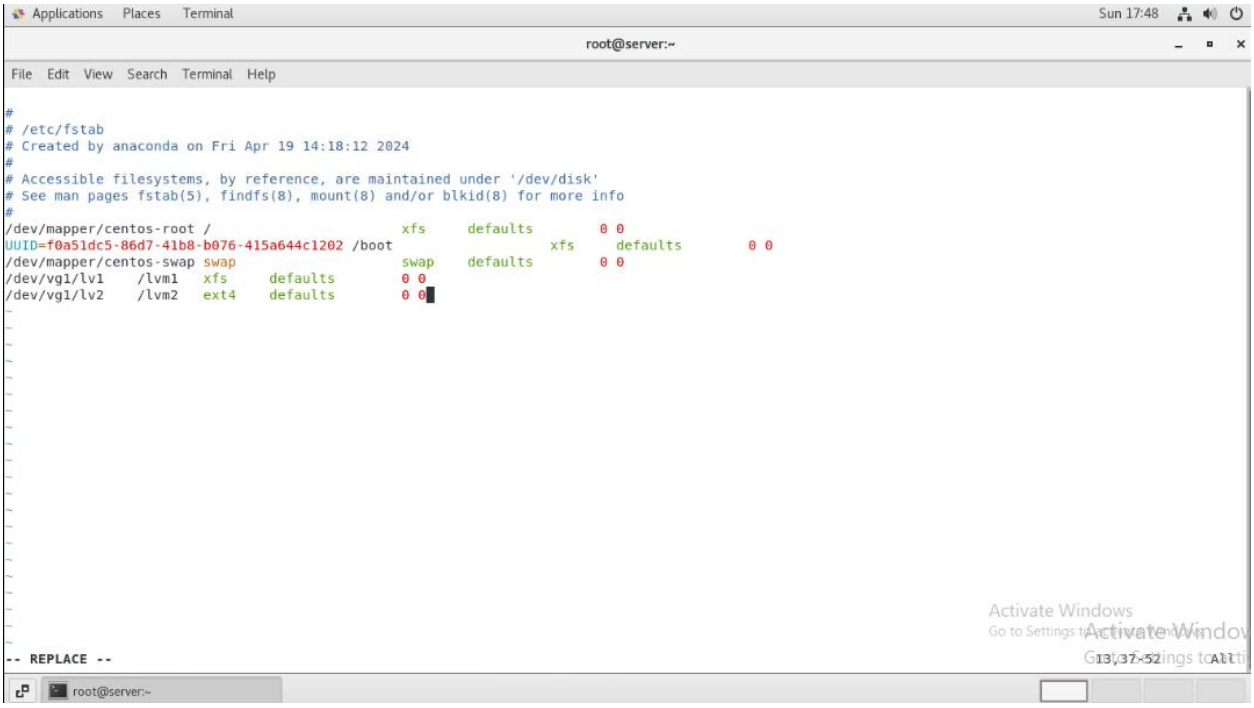
```
[root@server ~]# mkfs.xfs /dev/vg1/lv1
mkfs.xfs: /dev/vg1/lv1 appears to contain an existing filesystem (ext4).
mkfs.xfs: Use the -f option to force overwrite.
[root@server ~]# mkfs.xfs -f /dev/vg1/lv1
meta-data=/dev/vg1/lv1           isize=512    agcount=4, agsize=491008 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=0, sparse=0
data     =                       bsize=4096   blocks=1964032, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0 ftype=1
log      =internal log           bsize=4096   blocks=2560, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
[root@server ~]# mkfs.ext4 /dev/vg1/lv2
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
491520 inodes, 1965056 blocks
98252 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2013265920
60 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

Allocating group tables: done
Writing inode tables: done
```


```
[root@server ~]# lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda               8:0    0   30G  0 disk
├─sda1            8:1    0    1G  0 part /boot
└─sda2            8:2    0   29G  0 part
  ├─centos-root 253:0    0   26G  0 lvm  /
  └─centos-swap 253:1    0    3G  0 lvm  [SWAP]
sdb               8:16   0    5G  0 disk
└─sdb1            8:17   0    5G  0 part
sdc               8:32   0    5G  0 disk
└─sdc1            8:33   0    5G  0 part
  └─vg1-lv1     253:2    0  7.5G  0 lvm
sdd               8:48   0    5G  0 disk
└─sdd1            8:49   0    5G  0 part
  ├─vg1-lv1     253:2    0  7.5G  0 lvm
  └─vg1-lv2     253:3    0  7.5G  0 lvm
sde               8:64   0    5G  0 disk
└─sde1            8:65   0    5G  0 part
  └─vg1-lv2     253:3    0  7.5G  0 lvm
sr0              11:0    1  4.4G  0 rom  /run/media/root/CentOS 7 x86_64
```

Step 6 : add both lvms in fstab file

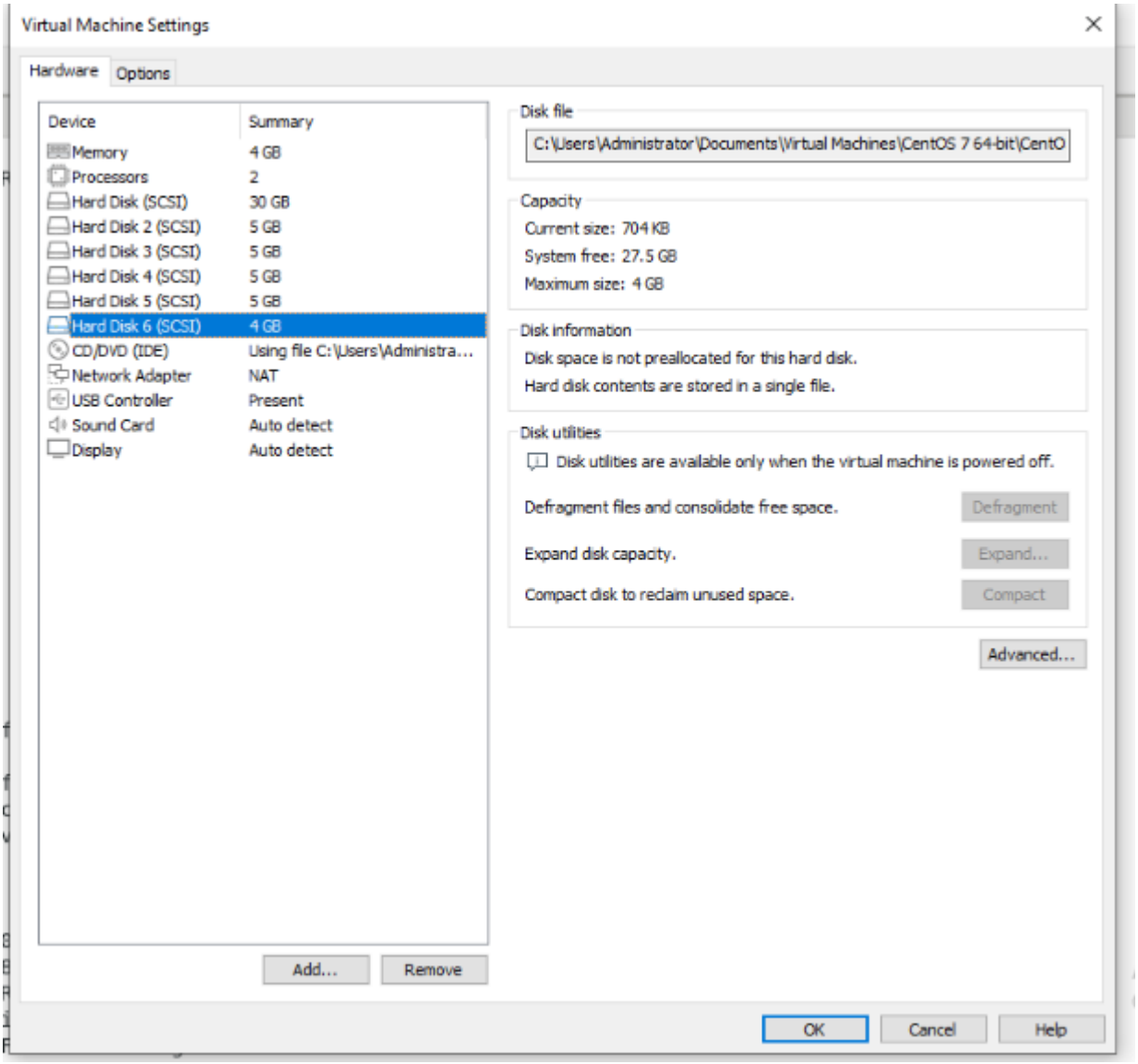
vim /etc/fstab



Step 7 : create a mount point for lv1 and lv2

```
[root@server ~]# mkdir /lvm1
[root@server ~]# mkdir /lvm2
[root@server ~]# mount -a
[root@server ~]# mount | grep /lvm1
/dev/mapper/vg1-lv1 on /lvm1 type xfs (rw,relatime,attr2,inode64,noquota)
[root@server ~]# mount | grep /lvm2
/dev/mapper/vg1-lv2 on /lvm2 type ext4 (rw,relatime,data=ordered)
[root@server ~]# df -h
Filesystem               Size  Used Avail Use% Mounted on
devtmpfs                 1.9G     0  1.9G   0% /dev
tmpfs                    1.9G     0  1.9G   0% /dev/shm
tmpfs                    1.9G   13M  1.9G   1% /run
tmpfs                    1.9G     0  1.9G   0% /sys/fs/cgroup
/dev/mapper/centos-root   26G  7.4G   19G  29% /
/dev/sda1               1014M  187M  828M  19% /boot
tmpfs                    378M   28K  378M   1% /run/user/0
/dev/sr0                 4.4G  4.4G     0 100% /run/media/root/CentOS 7 x86_64
/dev/mapper/vg1-lv1      7.5G   33M  7.5G   1% /lvm1
/dev/mapper/vg1-lv2      7.3G   34M  6.9G   1% /lvm2
[root@server ~]#
```

Step 8 : Add 4gb hdd



Step 9 : Create partition for /dev/sdf (this was newly created 4gb hdd)

#fdisk /dev/sdf

n

Enter and create partition

t

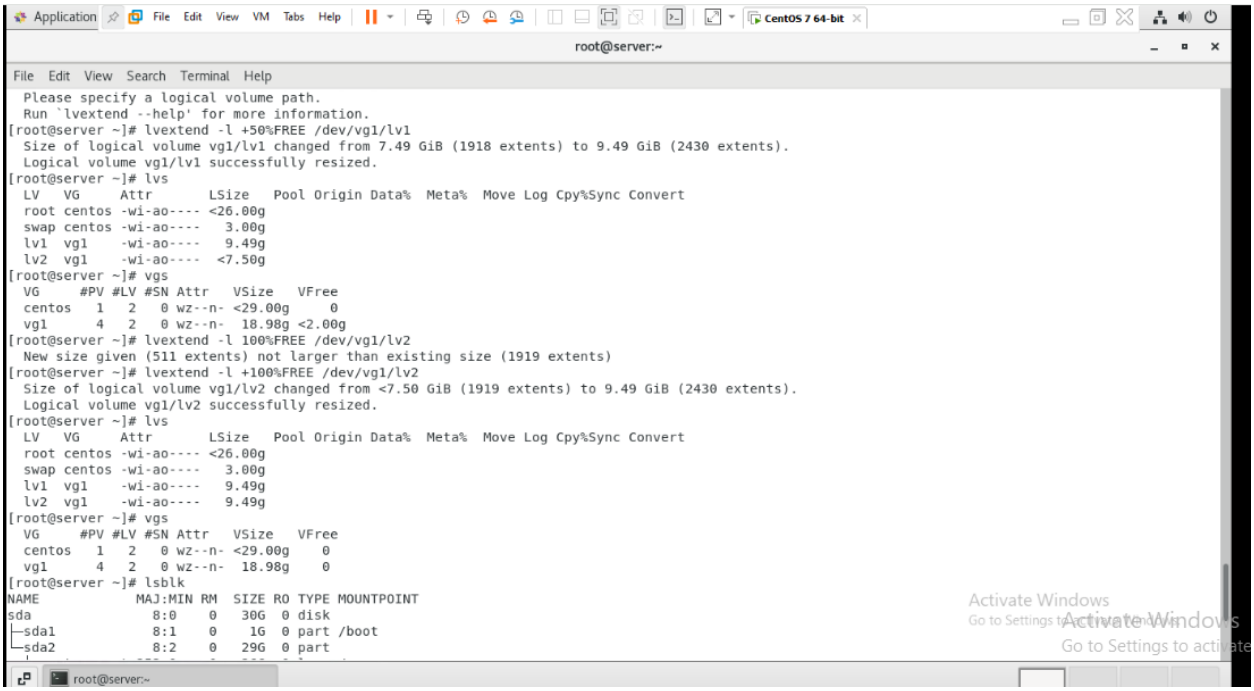
8e (for linux lvm)

Here below we can see partition created

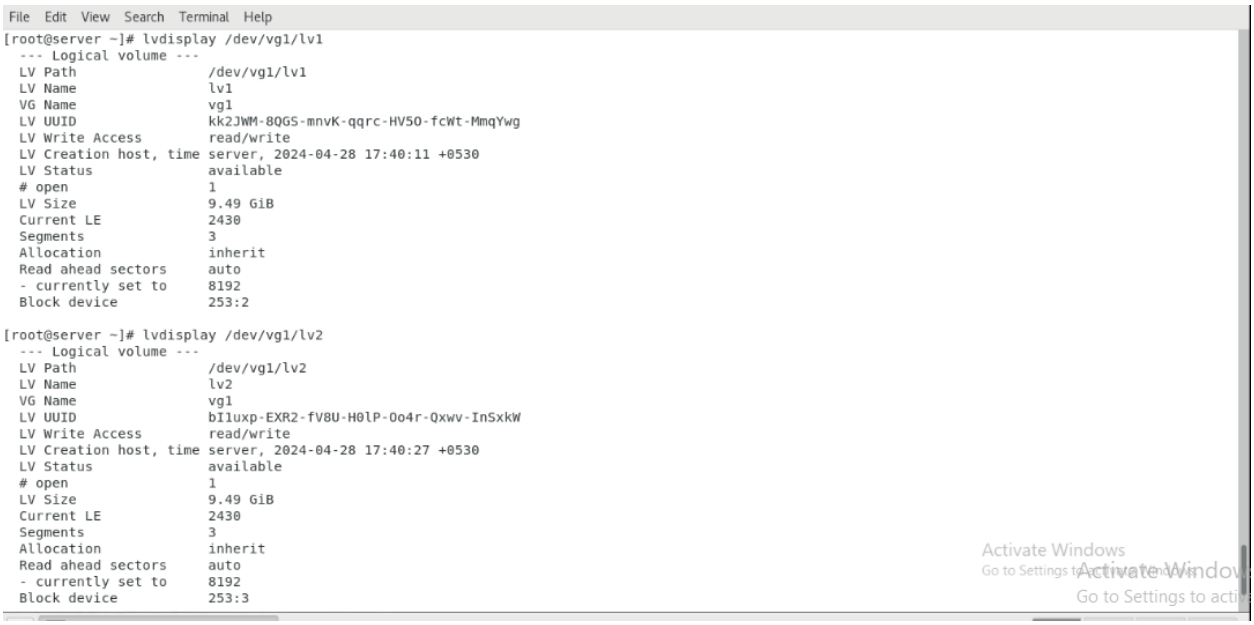
Step 10 : create physical volume for sdf1 and Extend the volume group by #vgextend command

```
[root@server ~]# lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda               8:0    0   30G  0 disk
├─sda1            8:1    0    1G  0 part /boot
└─sda2            8:2    0   29G  0 part
  ├─centos-root 253:0    0   26G  0 lvm  /
  └─centos-swap 253:1    0    3G  0 lvm  [SWAP]
sdb               8:16   0    5G  0 disk
└─sdb1            8:17   0    5G  0 part
sdc               8:32   0    5G  0 disk
└─sdc1            8:33   0    5G  0 part
  └─vg1-lv1     253:2    0  7.5G  0 lvm  /lvm1
sdd               8:48   0    5G  0 disk
└─sdd1            8:49   0    5G  0 part
  ├─vg1-lv1     253:2    0  7.5G  0 lvm  /lvm1
  └─vg1-lv2     253:3    0  7.5G  0 lvm  /lvm2
sde               8:64   0    5G  0 disk
└─sde1            8:65   0    5G  0 part
  └─vg1-lv2     253:3    0  7.5G  0 lvm  /lvm2
sdf               8:80   0    4G  0 disk
└─sdf1            8:81   0    4G  0 part
sr0              11:0    1  4.4G  0 rom  /run/media/root/CentOS 7 x86_64
[root@server ~]# pvcreate /dev/sgf1
  Device /dev/sgf1 not found.
[root@server ~]# pvcreate /dev/sdf1
  Physical volume "/dev/sdf1" successfully created.
[root@server ~]# vgextend vg1 /dev/sdf1
  Volume group "vg1" successfully extended
[root@server ~]# vgs
  VG     #PV #LV #SN Attr   VSize   VFree
  centos   1   2   0 wz--n- <29.00g     0
  vg1      4   2   0 wz--n-  18.98g <4.00g
```

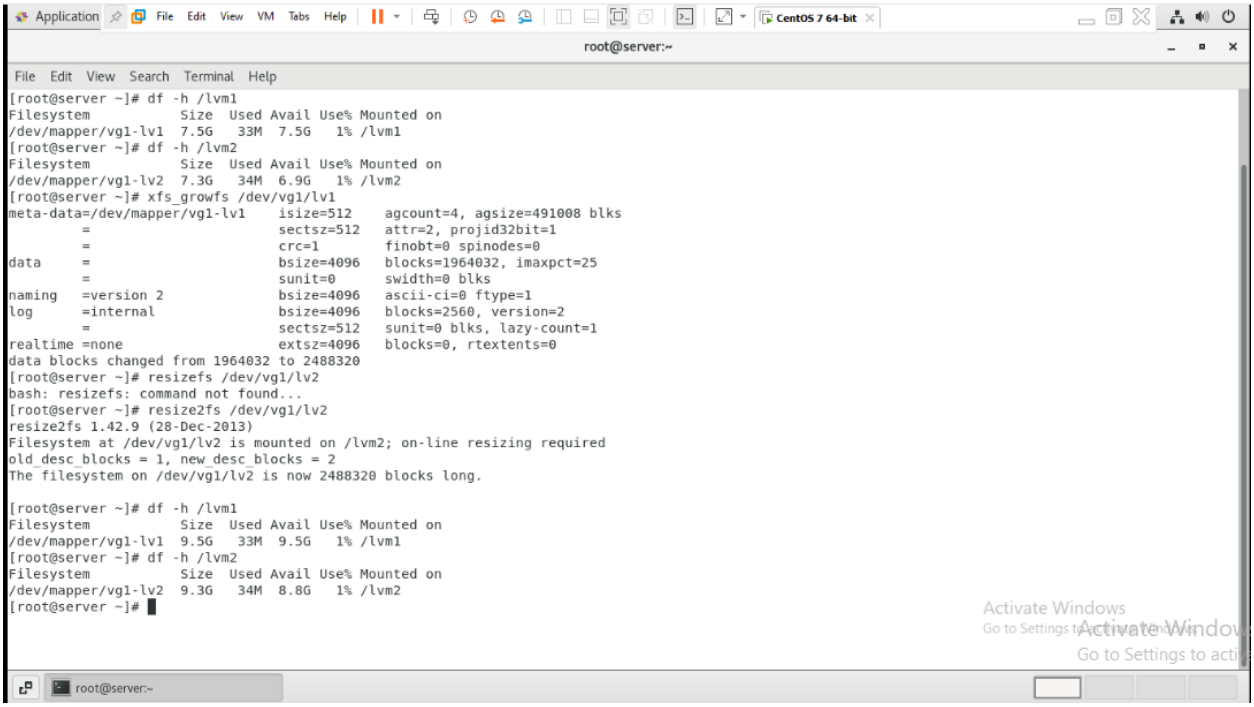
Step11 : lvextend




```
File  Edit  View  Search  Terminal  Help
[root@server ~]# lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda               8:0    0   30G  0 disk
├─sda1            8:1    0    1G  0 part /boot
└─sda2            8:2    0   29G  0 part
  ├─centos-root 253:0    0   26G  0 lvm  /
  └─centos-swap 253:1    0    3G  0 lvm  [SWAP]
sdb               8:16   0    5G  0 disk
└─sdb1            8:17   0    5G  0 part
sdc               8:32   0    5G  0 disk
└─sdc1            8:33   0    5G  0 part
  └─vg1-lv1     253:2    0  9.5G  0 lvm  /lvm1
sdd               8:48   0    5G  0 disk
└─sdd1            8:49   0    5G  0 part
  ├─vg1-lv1     253:2    0  9.5G  0 lvm  /lvm1
  └─vg1-lv2     253:3    0  9.5G  0 lvm  /lvm2
sde               8:64   0    5G  0 disk
└─sde1            8:65   0    5G  0 part
  └─vg1-lv2     253:3    0  9.5G  0 lvm  /lvm2
sdf               8:80   0    4G  0 disk
└─sdf1            8:81   0    4G  0 part
  ├─vg1-lv1     253:2    0  9.5G  0 lvm  /lvm1
  └─vg1-lv2     253:3    0  9.5G  0 lvm  /lvm2
sr0              11:0    1  4.4G  0 rom  /run/media/root/CentOS 7 x86_64
```



Final step : Resize the file system to utilize the additional space



Completed !!!