Ganpat University | Institute of Computer Technology
॥ विद्यया समाजोत्कर्षः ॥

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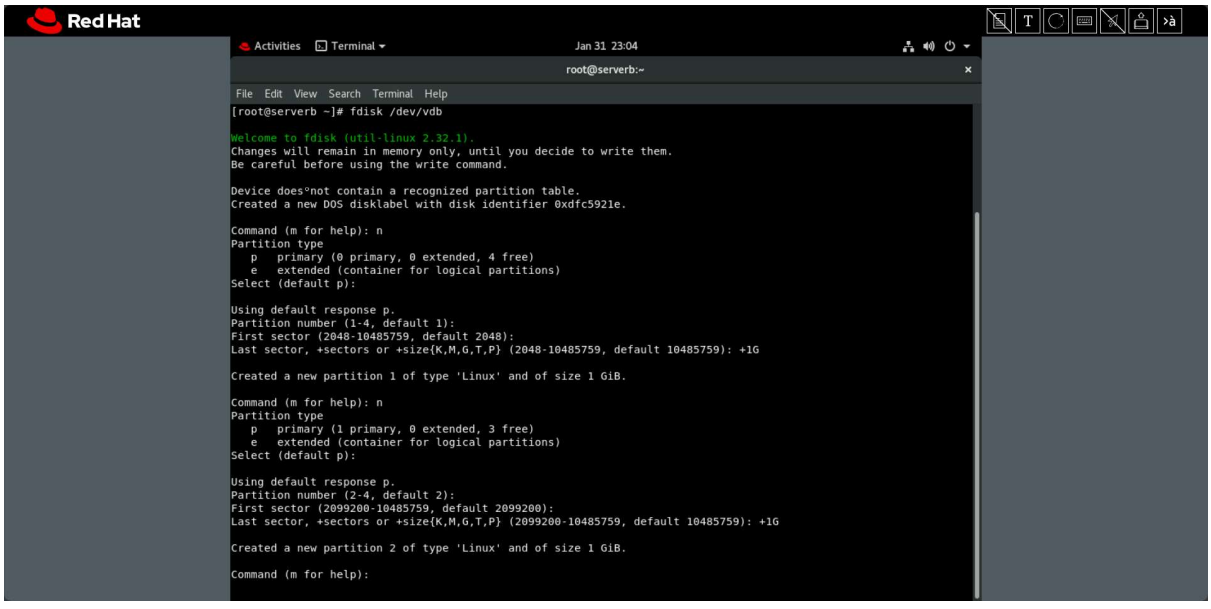
Batch:61

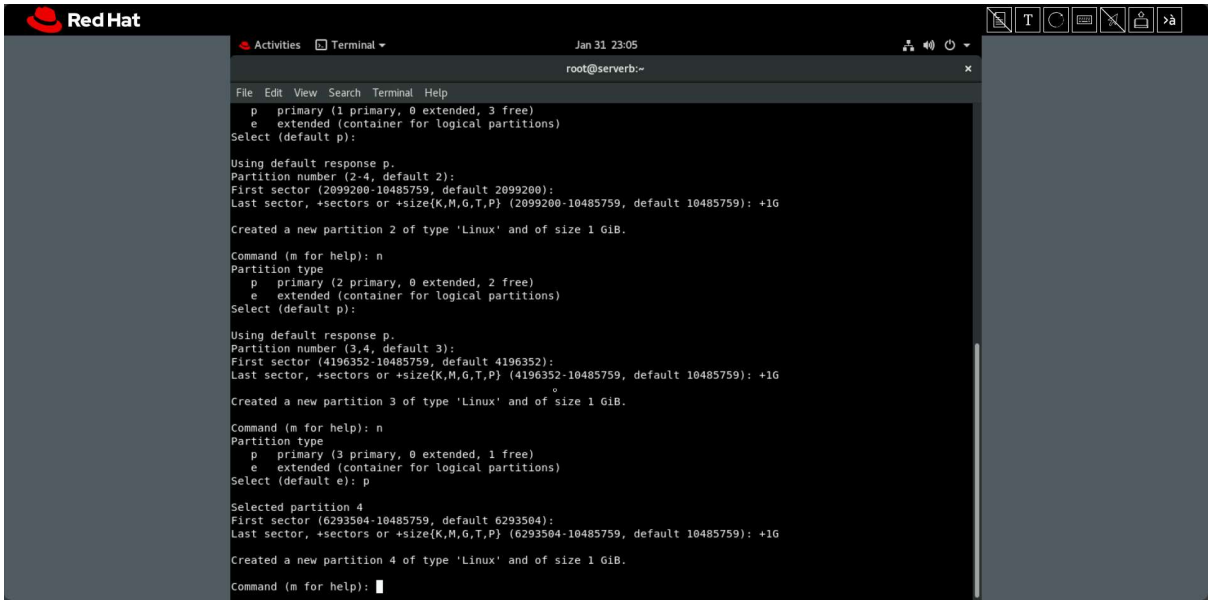
----------PRACTICAL 05----------

AIM : For this practical, you will add a physical volume, volume group, logical volume, and an XFS file system. You will persistently mount the logical volume file system.

1. Create 4 physical volume each of 1 GB size.

» Create 4 partitions in disk via fdisk :





Let's break down the commands we've executed :

1. **fdisk /dev/vdb**: This command opens the **fdisk** utility and specifies the target device as **/dev/vdb**. The utility starts with a message about changes being in memory until you decide to write them.
2. **n**: This command is used to create a new partition. After entering **n**, **fdisk** prompts you for the partition type.
3. When prompted for the partition type, you chose **p** for primary partition.
4. **Partition number (1-4, default 1)**: You're prompted to specify the partition number. You selected the default, which is 1.
5. **First sector (2048-10485759, default 2048)**: This is the starting sector for the new partition. The default is 2048, and you chose to use the default.
6. **Last sector, +sectors or +size{K,M,G,T,P} (2048-10485759, default 10485759)**: Here, you're asked to specify the ending

sector of the new partition. You specified **+1G**, indicating that the partition should be 1 gigabytes in size.

7. **Created a new 4 partitions of type 'Linux' and of size 1 GiB.**: This message confirms that you've successfully created a new primary partition of type 'Linux' with a size of 1 gigabytes.

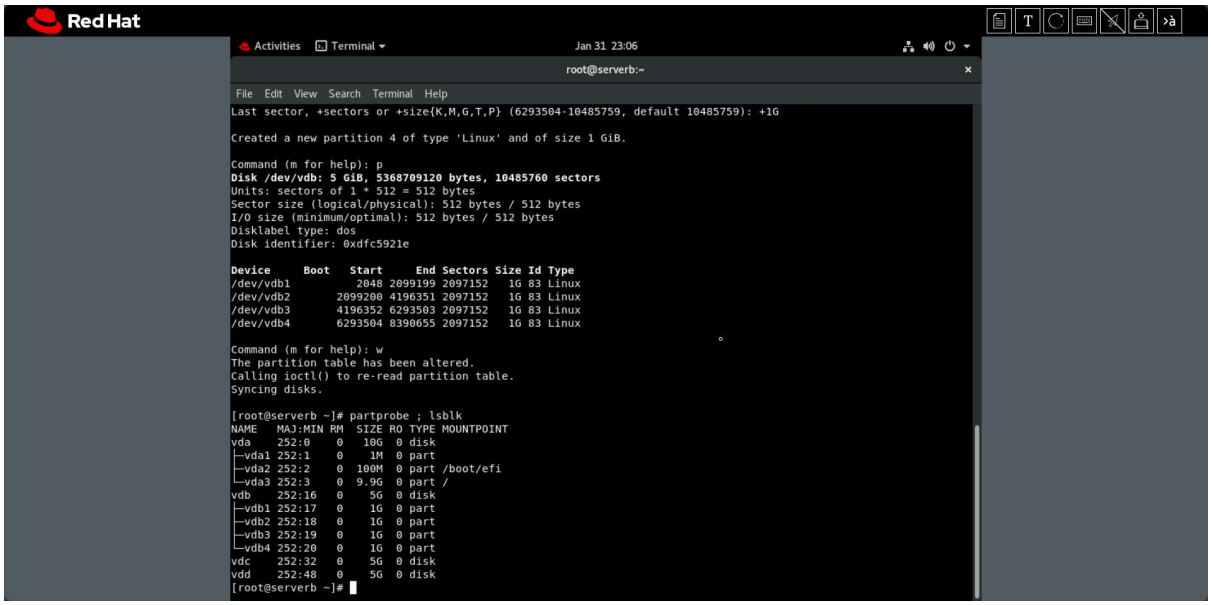
command : `fdisk /dev/vdb`

Then in next prompt (sub commands of fdisk) :

n (to create new partitions)

w (to write changes)

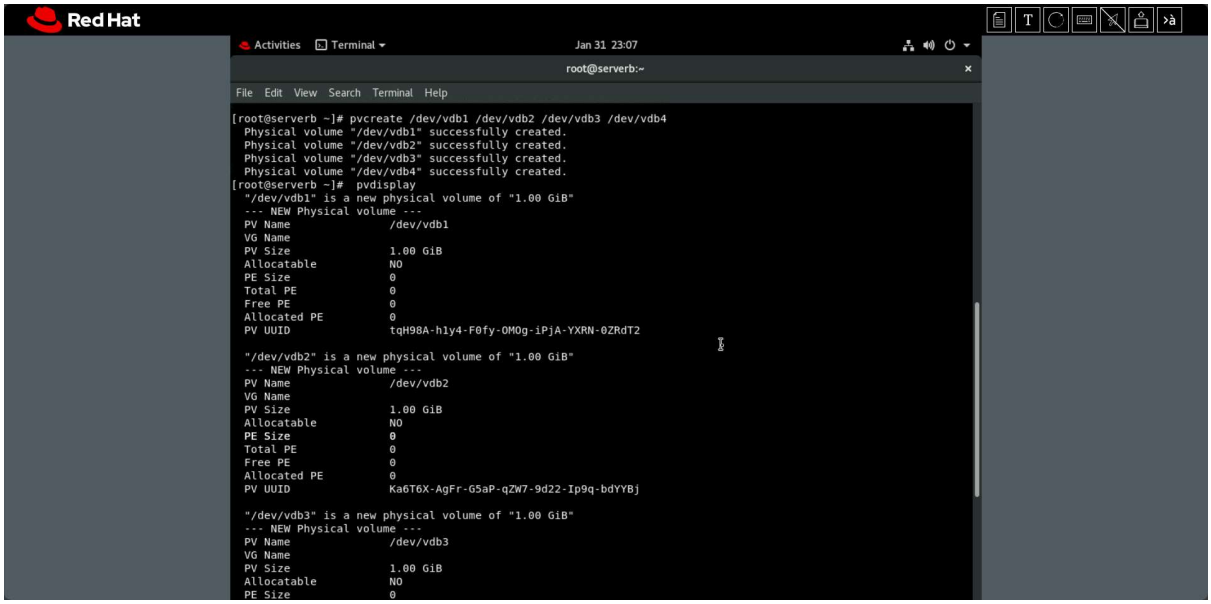
» **Check if the partitions are created successfully or not :**



command : `partprobe ; lsblk`

when you run **partprobe ; lsblk**, it updates the kernel with the current partition table and then immediately displays the updated information about block devices and their partitions using **lsblk**. This can be useful for quickly checking the status of disk partitions after making changes without requiring a system reboot.

» Create 4 physical volumes of the newly created partitions :



command : `pvcreate /dev/vdb1 /dev/vdb2 /dev/vdb3 /dev/vdb4`

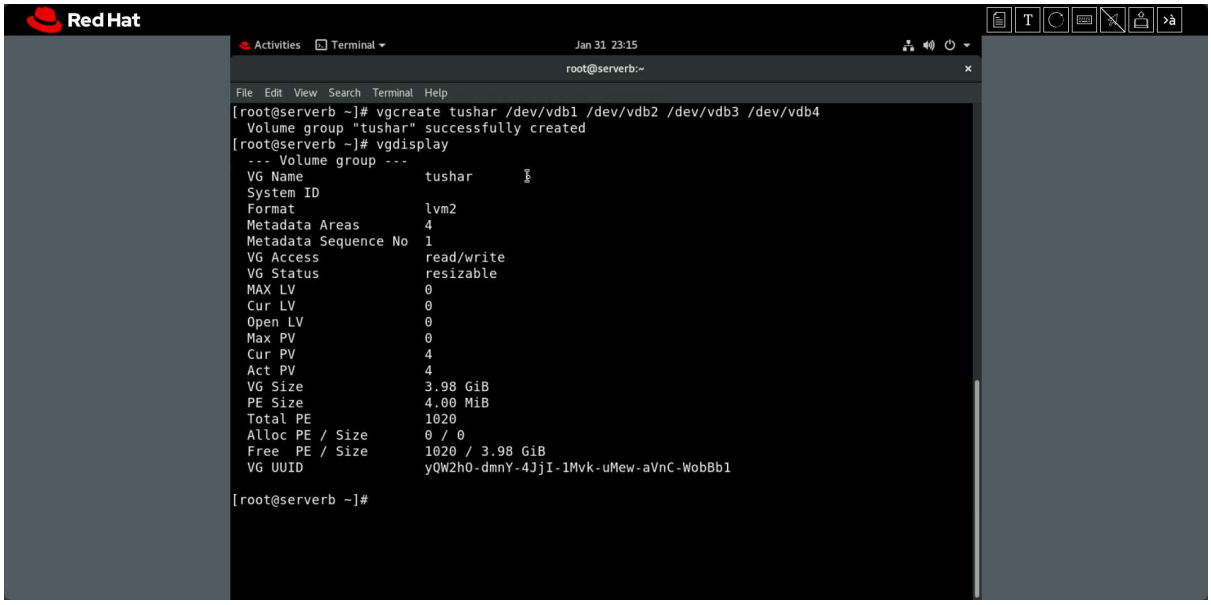
- This command is used to initialize physical volumes on the specified devices (**/dev/vdb1**, **/dev/vdb2**, **/dev/vdb3**, and **/dev/vdb4**).
- A physical volume is a disk or partition that LVM uses as a building block for creating volume groups.
- This command prepares the specified devices to be used within the LVM framework by adding metadata to them.

command : `pvdisplay`

- This command is used to display information about physical volumes that have been initialized using **pvcreate**.
- Running **pvdisplay** without specifying a particular device shows information about all physical volumes currently available on the system.
- The displayed information includes the physical volume name, size, allocation, free space, and other relevant details.

2. **Add all physical volume into the volume group pool, the pool name must be Yourname.**

» **Create volume group named tushar using vgcreate command and check its details :**



command : `vgcreate tushar /dev/vdb1 /dev/vdb2 /dev/vdb3 /dev/vdb4`

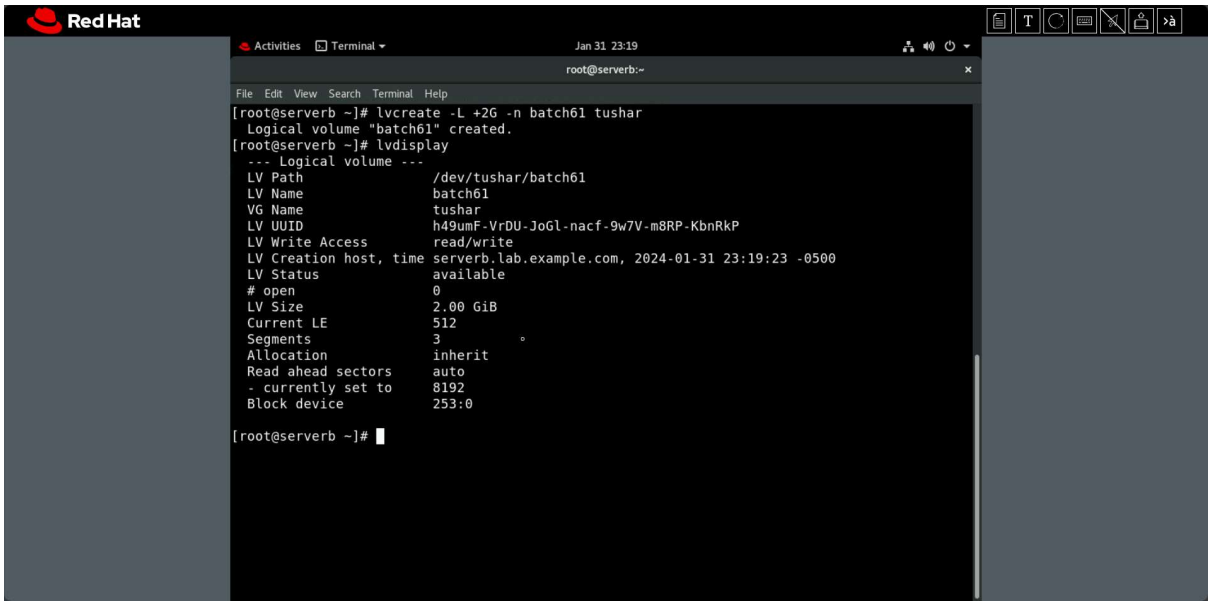
- **vgcreate**: This command is used to create a new volume group (VG) in LVM.
- **tushar**: This is the name of the volume group you are creating. In this case, it's named "tushar."
- **/dev/vdb1 /dev/vdb2 /dev/vdb3 /dev/vdb4**: These are the physical volumes (PVs) that you are adding to the volume group. Volume groups are composed of one or more physical volumes. In this command, you are adding four physical volumes (**/dev/vdb1**, **/dev/vdb2**, **/dev/vdb3**, and **/dev/vdb4**) to the "tushar" volume group.

command : `vgdisplay`

- This command is used to display information about volume groups.

3. **Logical volume size must be greater than 2 GB, name of the logical volume must be batch61.**

» **Create the logical volume of size 2 GB and name batch61 :**



command : `lvcreate -L +2G -n batch61 tushar`

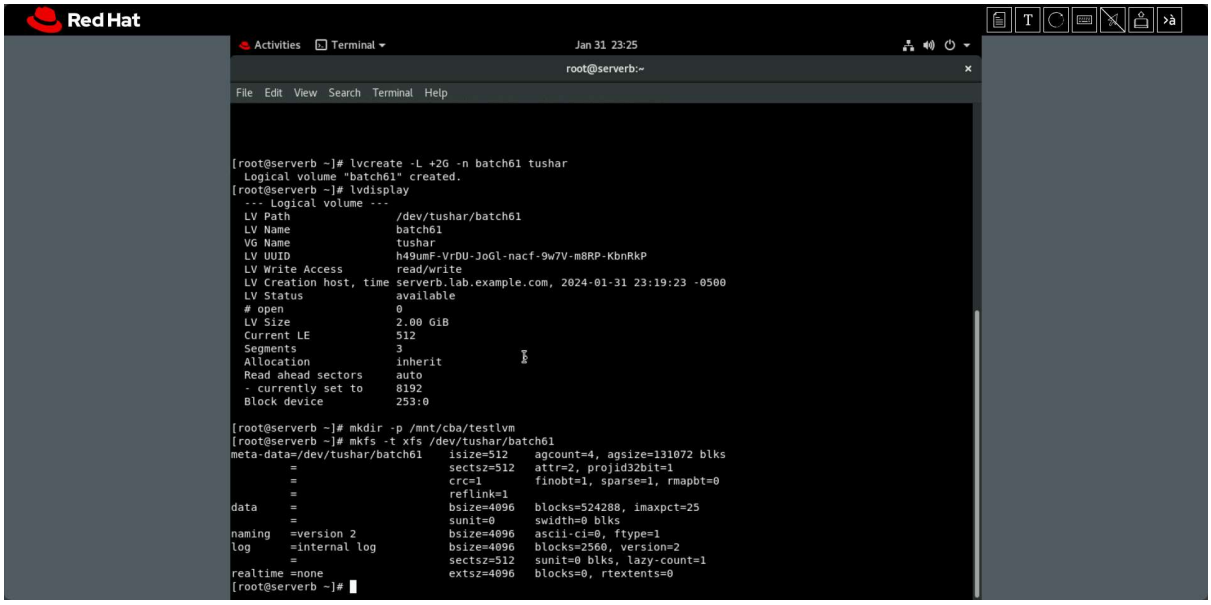
- **lvcreate**: This command is used to create a new logical volume (LV) within a specified volume group.
- **-L +2G**: This option specifies the size of the logical volume. In this case, it's set to 2 gigabytes. The **+** sign indicates an increment from the current size if the logical volume already exists.
- **-n batch61**: This option sets the name of the logical volume to "batch61."
- **tushar**: This is the name of the volume group in which the logical volume is being created.

command : `lvdisplay`

This command is used to display information about logical volumes.

4. **Mount the logical volume on the following location - /mnt/cba/testlvm.**

» **Create the directory /mnt/cba/testvlm for mounting the logical volume and assign filesystem to the logical volume :**



command : `mkdir -p /mnt/cba/testlvm`

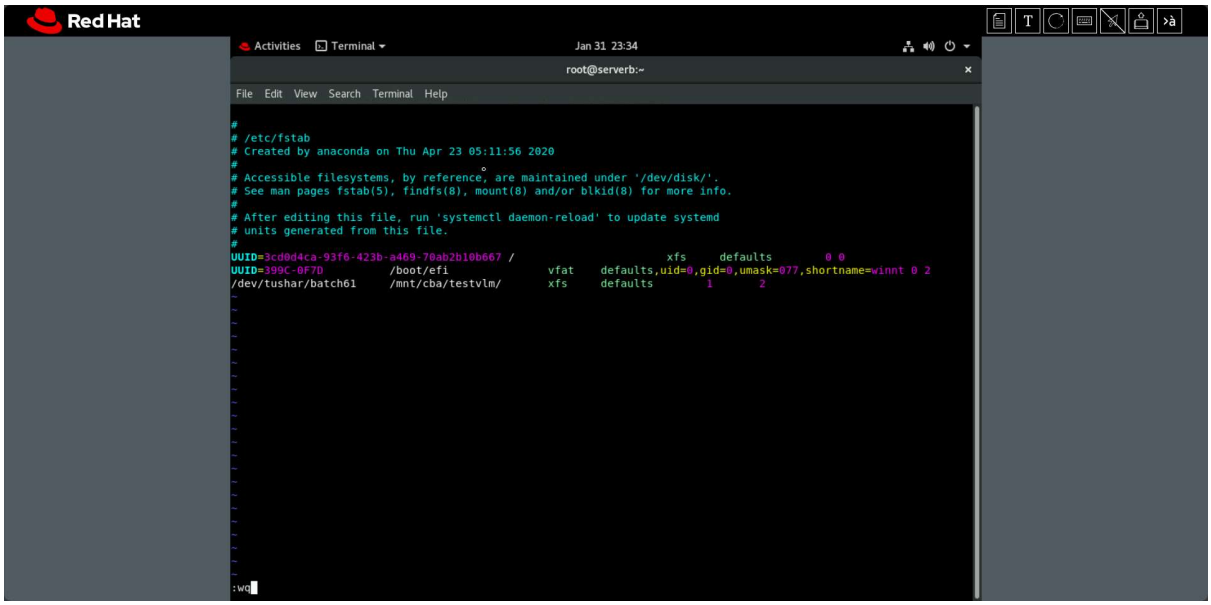
- The **mkdir** command is used to create directories in Unix-like operating systems.
- **-p** flag is used to create parent directories as needed. If the parent directories don't exist, they will be created.
- **/mnt/cba/testlvm** is the path where you want to create the directory. This command creates a directory named **testlvm** inside the **cba** directory, which is inside the **mnt** directory.

command : `mkfs -t xfs /dev/tushar/batch61`

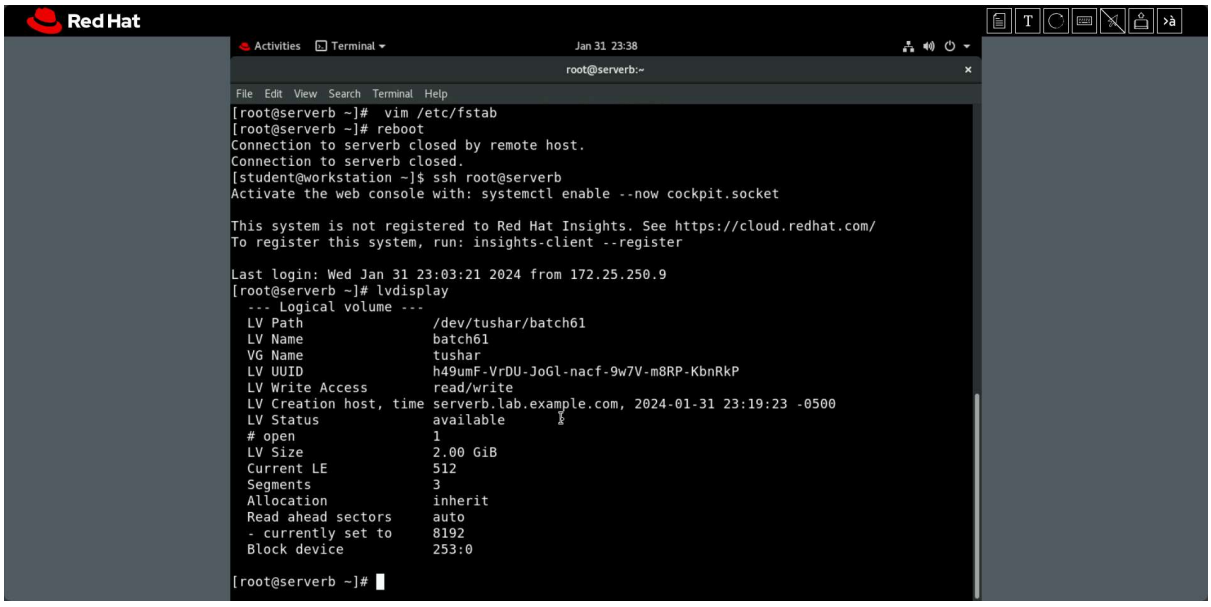
- **mkfs** is a command used to create a filesystem on a disk partition.
- **-t xfs** specifies the filesystem type to be created. In this case, it's XFS, a high-performance filesystem.

- **/dev/tushar/batch61** specifies the device or partition on which the filesystem will be created. It appears that **tushar** is a volume group name, and **batch61** is a logical volume within that volume group.

» Create the entry in /etc/fstab to start using the logical volume after reboot :



» Check after reboot if the changes are successful :



command : `rebooot`

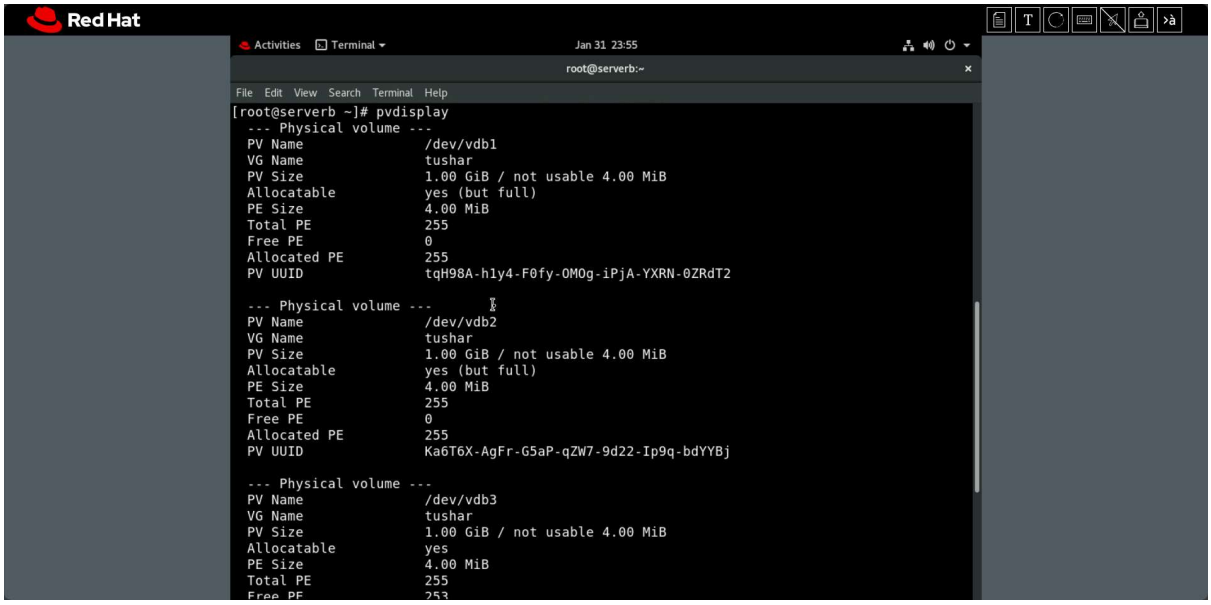
command : `lvdisplay`

5. Demonstrate how to view the details about the physical volume, physical extents, volume group and logical volume.

» **The commands used to get above details are shown below :**

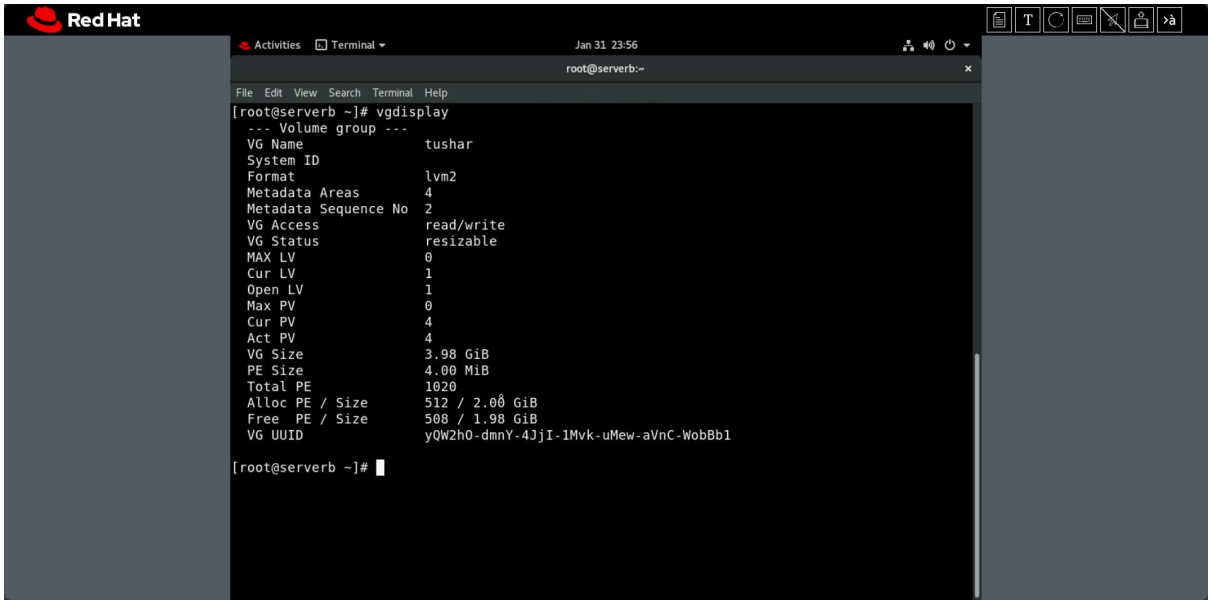
command : `pvdisplay`

- This command is used to display information about physical volumes.



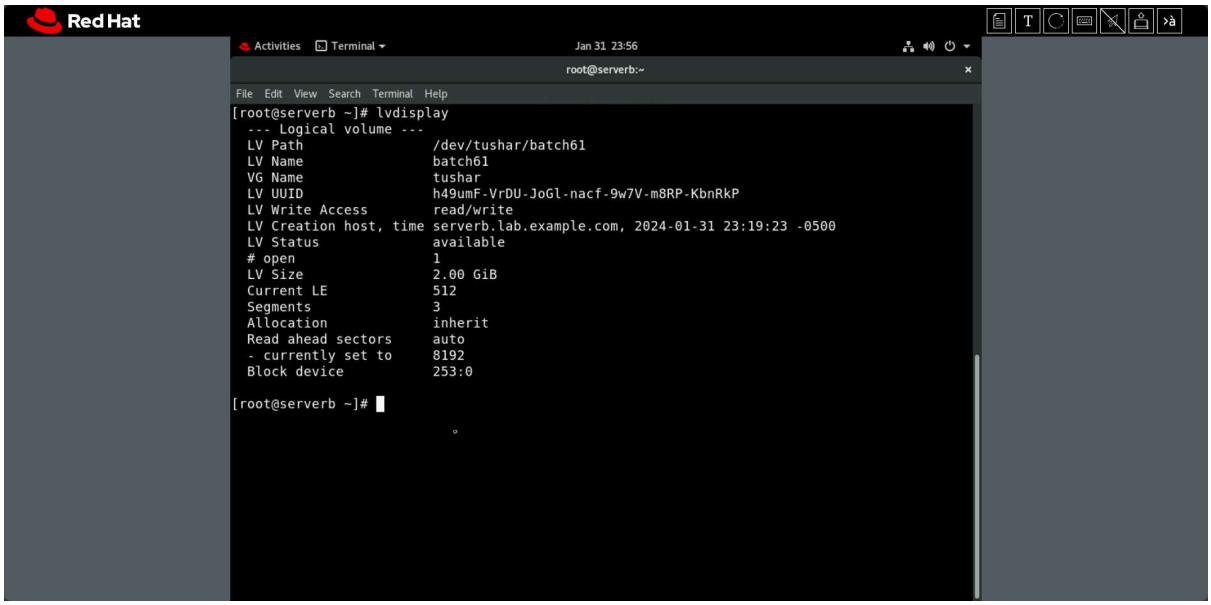
command : `vgdisplay`

- This command is used to display information about volume groups.



command : `lvdisplay`

- This command is used to display information about Logical Volumes.



6. Demonstrate how you can remove all logical volume.

Before removing the volumes perform question 7 so we can easily extend the volume but if we remove then we have to make new logical volume again.

» Unmount the logical volume and remove it :

```
[root@serverb ~]# umount /mnt/cba/testvlm
[root@serverb ~]# lvremove /dev/tushar/batch61
Do you really want to remove active logical volume tushar/batch61? [y/n]: y
  Logical volume "batch61" successfully removed
[root@serverb ~]#
```

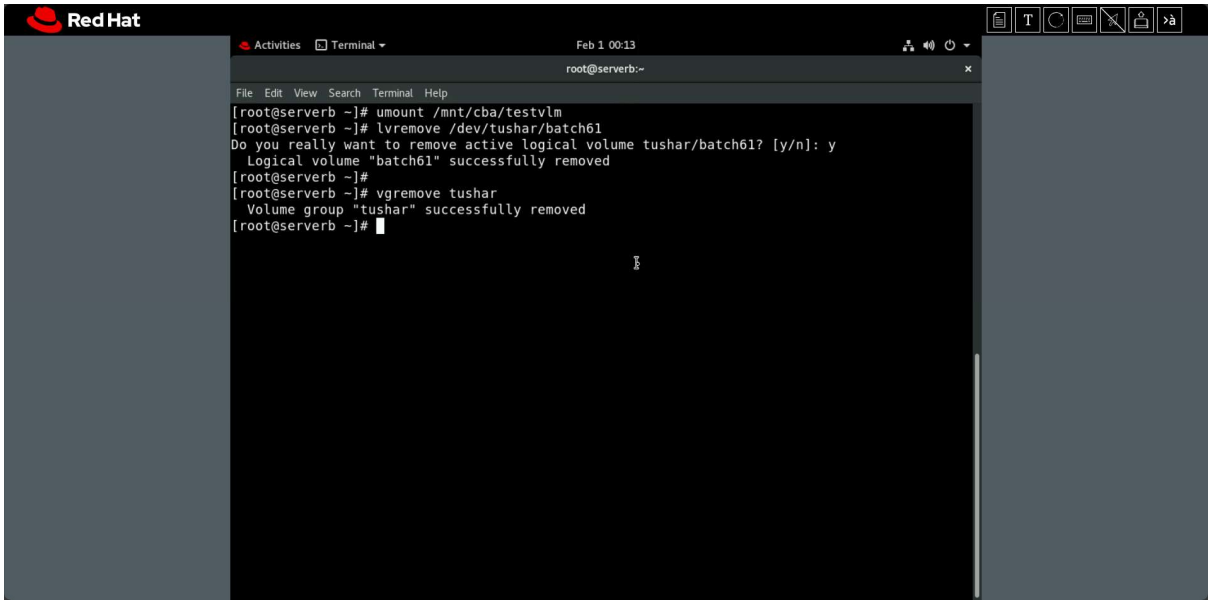
command : `umount /mnt/cba/testvlm`

- The **umount** command is used to unmount (detach) a mounted filesystem in Unix-like operating systems.
- **/mnt/cba/testvlm** is the path to the directory where the filesystem is mounted. This command unmounts the filesystem located at **/mnt/cba/testvlm**.

command : `lvremove /dev/tushar/batch61`

- The **lvremove** command is used to remove (delete) a logical volume in LVM (Logical Volume Manager).
- **/dev/tushar/batch61** is the full path to the logical volume you want to remove. It specifies the logical volume named "batch61" within the volume group named "tushar."

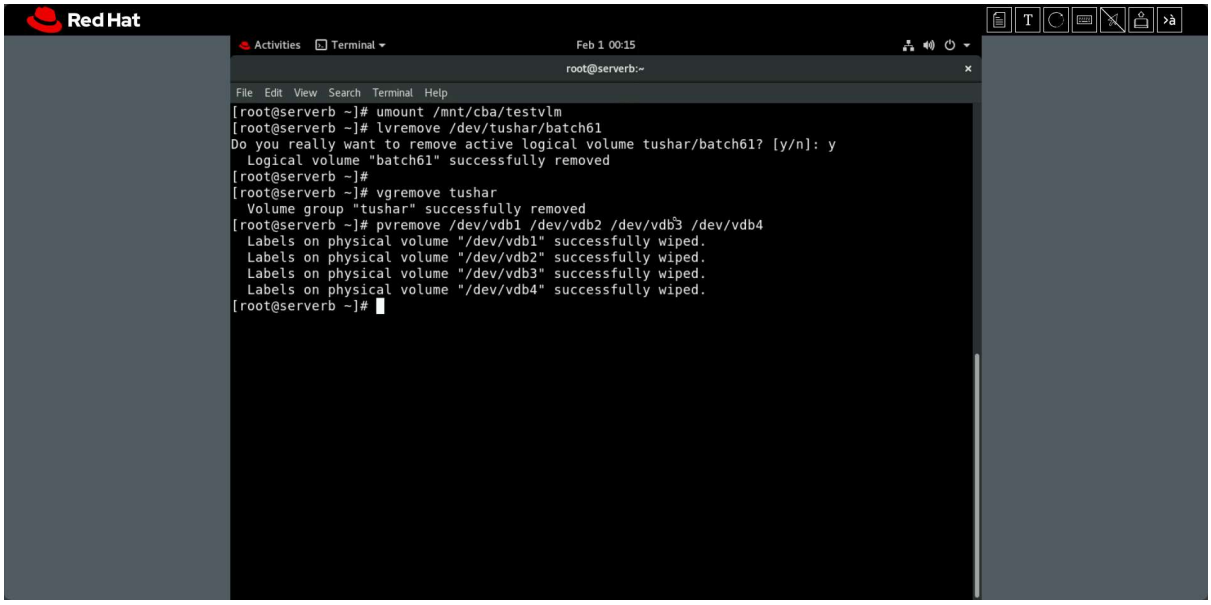
» Remove the volume group also :



command : `vgremove tushar`

- **vgremove**: This is the command used to remove an existing volume group.
- **tushar**: This is the name of the volume group you want to remove.

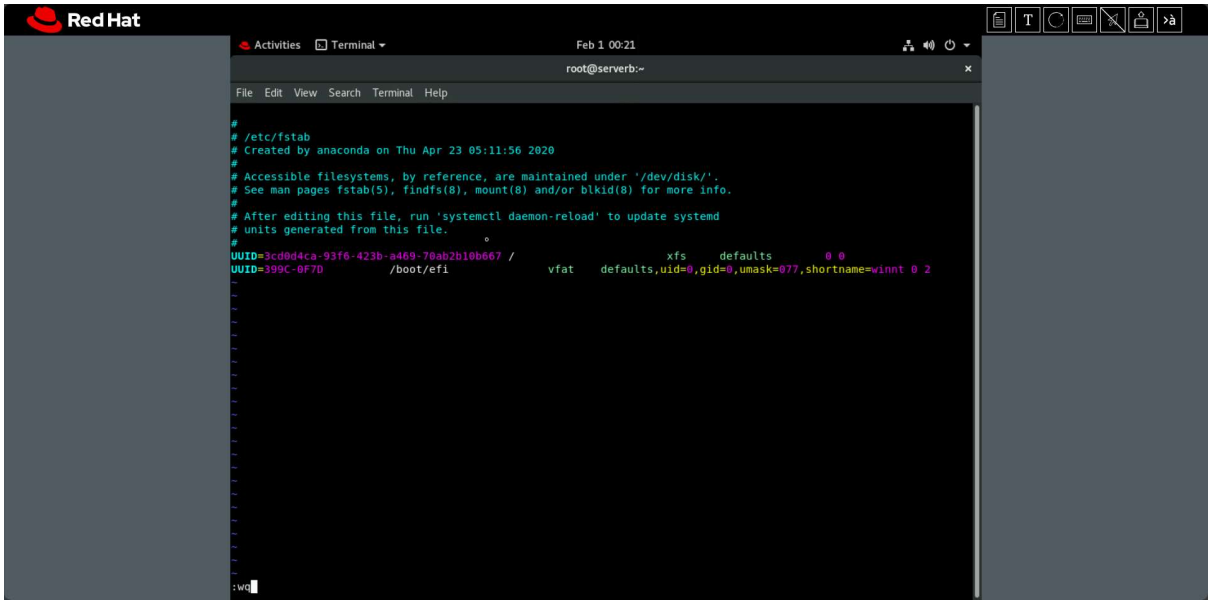
» Afterwards, remove the physical volumes :



command : `pvremove /dev/vdb1 /dev/vdb2 /dev/vdb3 /dev/vdb4`

The **pvremove** command is used to remove LVM (Logical Volume Manager) label or metadata from physical volumes. It detaches the specified physical volumes from the LVM setup

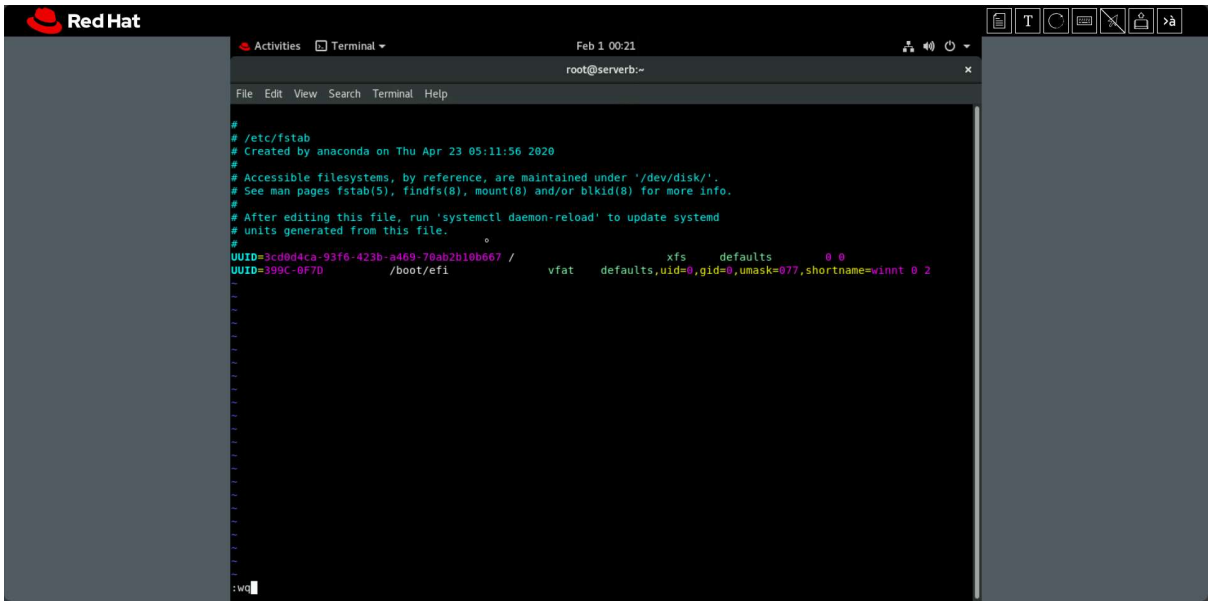
» Remove the entry from /etc/fstab :



command : `vim /etc/fstab`

The command **vim /etc/fstab** is used to open and edit the **/etc/fstab** file using the Vim text editor

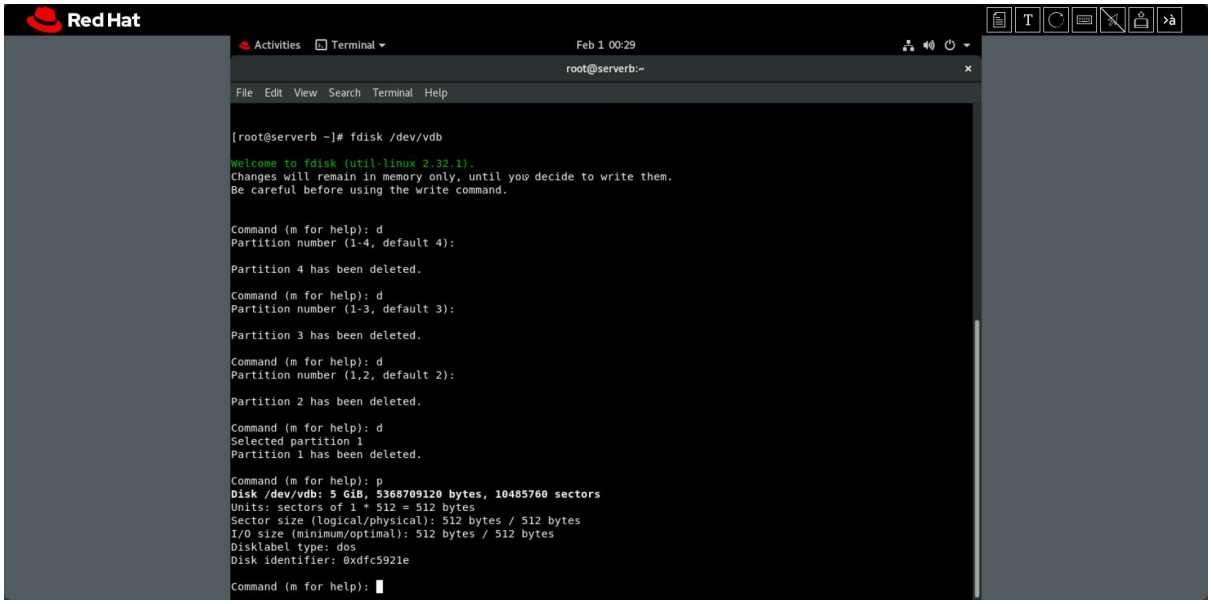
» Remove the entry from /etc/fstab :



command : `vim /etc/fstab`

The command **vim /etc/fstab** is used to open and edit the **/etc/fstab** file using the Vim text editor

» Delete the partitions from disk :

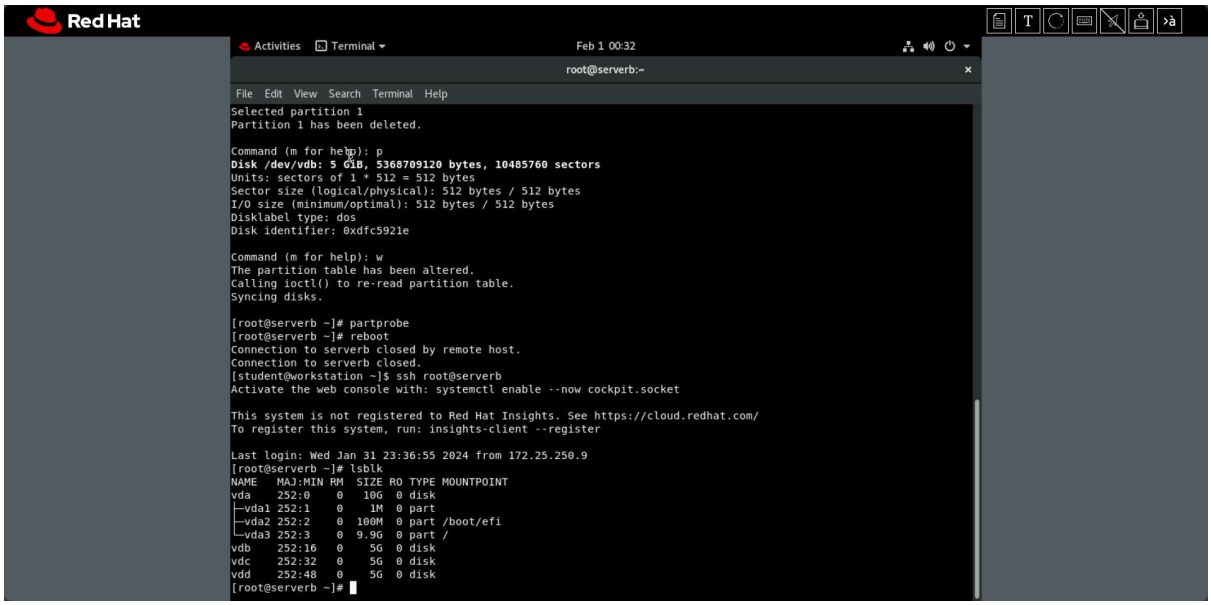


command : `fdisk /dev/vdb`

Then in next prompt (sub commands of fdisk) :

d (to delete partition)

» Reboot and check with lsblk if the changes are successful :



command : `ldblk`

The **lsblk** command is used to list information about block devices on a Linux system

7. **Extent the logical volume that you have previously created by 300 MB. Resizing should be done while the file system is still mounted and in use.**

```
[root@serverb ~]# lvextend -L +300M -r /dev/tushar/batch61
  Size of logical volume tushar/batch61 changed from 2.00 GiB (512 extents) to 2.29 GiB (587 extents).
  Logical volume tushar/batch61 successfully resized.
meta-data=/dev/mapper/tushar-batch61 isize=512    agcount=4, agsize=131072 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=1, sparse=1, rmapbt=0
         =                       reflink=1
data     =                       bsize=4096   blocks=524288, 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
data blocks changed from 524288 to 601088
[root@serverb ~]#
```

command : `lvextend -L +300M -r /dev/tushar/batch61`

- **lvextend**: This is the command used to extend a logical volume.
- **-L +300M**: This option specifies the size by which you want to extend the logical volume. In this case, it's extending by 300 megabytes. The **+** sign indicates an increase by the specified amount.
- **-r**: This option is used to resize the filesystem on the logical volume after extending it. The **-r** flag is a convenience option that automatically resizes the filesystem to occupy the entire logical volume.
- **/dev/tushar/batch61**: This is the full path to the logical volume you want to extend. It specifies the logical volume named "batch61" within the volume group named "tushar."

» To check if the logical volume has been successfully extended:

```
[root@serverb ~]# lvdisplay
  --- Logical volume ---
  LV Path                /dev/tushar/batch61
  LV Name                batch61
  VG Name                tushar
  LV UUID                h49umF-VrDU-JoGl-nacf-9w7V-m8RP-KbnRkP
  LV Write Access        read/write
  LV Creation host, time serverb.lab.example.com, 2024-01-31 23:19:23 -0500
  LV Status              available
  # open                 1
  LV Size                2.29 GiB
  Current LE             587
  Segments               3
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     8192
  Block device           253:0
```

command : `lvdisplay`

- This command is used to display information about Logical Volumes.