

ITIM

PRACTICAL - 5

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Tasks :

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.

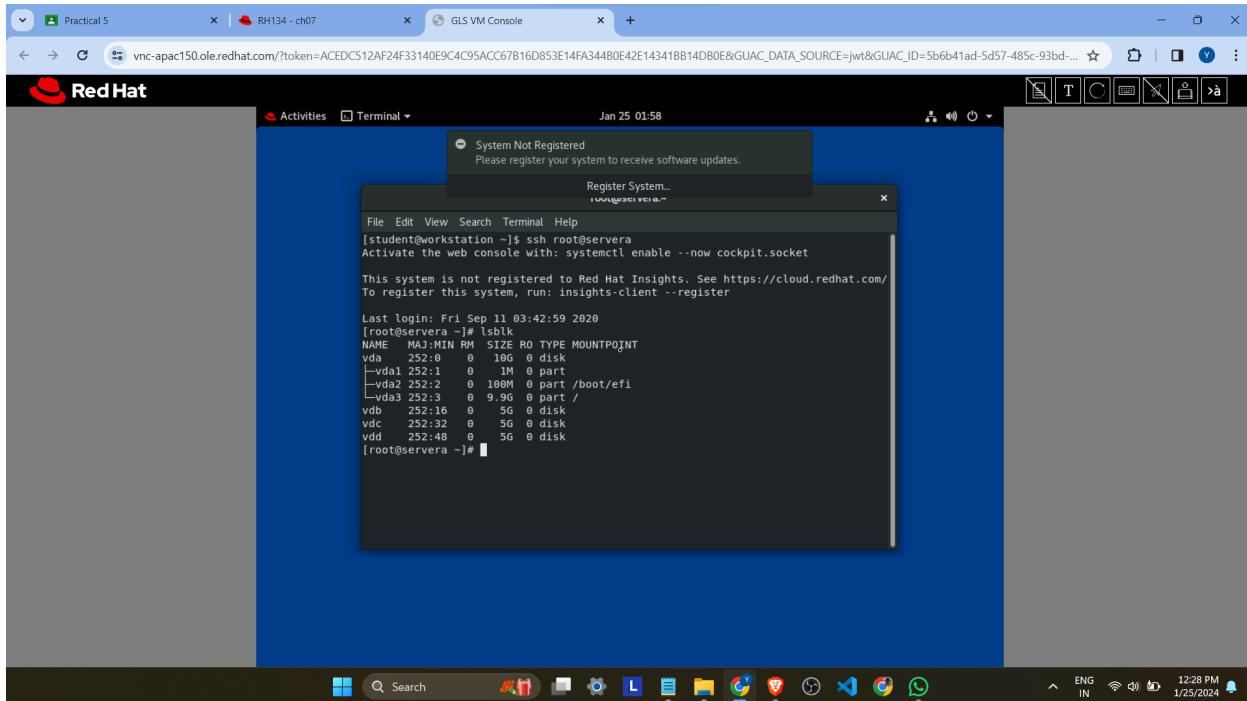
- 1) Create 4 physical volume each of 1 GB size
- 2) Add all physical volume into the volume group pool, the pool name must be Yourname
- 3) Logical volume size must be greater than 2 GB, name of the logical volume must be batch61
- 4) Mount the logical volume on the following location - /mnt/cba/testlvm
- 5) Demonstrate how to view the details about the physical volume, physical extents, volume group and logical volume.
- 6) Demonstrate how you can remove all logical volume.
- 7) Extend 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.

Steps :

Question 1 :

Create 4 physical volume each of 1 GB size

First Login as a root user into servera using `root@servera`



`Lsblk` to know the current partitions

Create 4 partition of vdb using `fdisk /dev/vdb`

Then type `n` to create new partition

Let first sector be default

Type `+1G` in last sector to make partition of 1 Gb.

Then type `t` to change the type of the partition

Here we can use `L` to get all the possible types and their hex codes

Then type `8e` which is the hexcode of Linux LVM

Finally press `w` to save changes

Similarly create 4 partitions

Practical 5 | RH134 - ch07 | GLS VM Console | Untitled document - Google Docs | Prac4_ITIM_yagna - Google Docs | +

vnc-apac150.ole.redhat.com/?token=ACEDC512AF24F33140E9C4C95ACC67B16D853E14FA344B0E42E14341BB14DB0E&GUAC_DATA_SOURCE=jwt&GUAC_ID=5b6b41ad-5d57-485c-93bd-...



Activities Terminal Jan 25 02:06

System Not Registered
Please register your system to receive software updates.
Register System...

root@servera:~# fdisk /dev/vdb

```
welcome to fdisk (util-linux 2.32.1).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)      b
Select (default p): p
Partition number (1-4, default 1): 4
First sector (2048-10485759, default 2048):
Last sector, +sectors or +size{K,M,G,T,P} (2048-10485759, default 10485759): +16

Created a new partition 4 of type 'Linux' and of size 1 GiB.

Command (m for help): t
Selected partition 4
Hex code (type L to list all codes): L

 0  Empty           24  NEC DOS      81  Minix / old Lin bf  Solaris
 1  FAT12          27  Hidden NTFS Win 82  Linux swap / So c1  DRDO5/sec (FAT-
 2  XENIX root    39  Plan 9       83  Linux          c4  DRDO5/sec (FAT-
 3  XENIX usr     3c  PartitionMagic 84  OS/2 hidden or c6  DRDO5/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-NTS data
 6  FAT16          42  SFS          87  NTFS volume set db  CP/M / CTOS /

```

File Edit View Search Terminal Help

root@servera ~#

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vnc-apac150.ole.redhat.com/?token=ACEDC512AF24F33140E9C4C95ACC67B16D853E14FA344B0E42E14341BB14DB0E&GUAC_DATA_SOURCE=jwt&GUAC_ID=5b6b41ad-5d57-485c-93bd-...



Activities Terminal Jan 25 02:06

System Not Registered
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Register System...

root@servera:~# fdisk /dev/vdb

```
welcome to fdisk (util-linux 2.32.1).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)      b
Select (default p): p
Partition number (1-4, default 1): 4
First sector (2048-10485759, default 2048):
Last sector, +sectors or +size{K,M,G,T,P} (2048-10485759, default 10485759): +16

Created a new partition 4 of type 'Linux' and of size 1 GiB.

Command (m for help): t
Selected partition 4
Hex code (type L to list all codes): L

 0  Empty           24  NEC DOS      81  Minix / old Lin bf  Solaris
 1  FAT12          27  Hidden NTFS Win 82  Linux swap / So c1  DRDO5/sec (FAT-
 2  XENIX root    39  Plan 9       83  Linux          c4  DRDO5/sec (FAT-
 3  XENIX usr     3c  PartitionMagic 84  OS/2 hidden or c6  DRDO5/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-NTS 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 95  89  Linux           df  BootIt
 9  AIX bootable  4f  QNX4.x 3rd part 95  90  BSDI BSD      e1  DOS access
 a  OS/2 Boot Manag 50  OnTrack DM 94  Amoeba BBT      e3  R/O
 b  W95 FAT32    51  OnTrack DM Aux 9f  BSD/OS      e4  SpeedStor
 c  W95 FAT32 (LBA) 52  CP/M      98  IBM Thinkpad hi ea  Rufus alignment
 d  W95 FAT16 (LBA) 53  OnTrack DM Aux 95  FreeBSD      eb  BeOS fs
 f  W95 Ext'd (LBA) 54  OnTrackDM6  a0  OpenBSD      ee  GPT
10  OPU             55  EZ-Drive    a7  NeXTSTEP      ef  EFI (FAT-12/16/
11  Hidden FAT12    56  Golden Bow  a8  Darwin UFS      f0  Linux/PA-RISC b
12  Compaq diagnost 5c  Priam Edisk  a9  NetBSD      f1  SpeedStor
14  Hidden FAT16 <3 61  SpeedStor  ab  Darwin boot      f4  SpeedStor
16  Hidden FAT16    63  GNU HURD or Sys af  HFS / HFS+   f2  DOS secondary
17  Hidden HPFS/NTF 64  Novell Network b7  BSD/OS      fb  VMware VMFS
18  AST SmartSleep  65  Novell Network b8  BSD/1 swap      fc  VMware VMKCORE
1b  Hidden W95 FAT3 70  DiskSecure Mult bb  Boot Wizard hid fd  Linux raid auto
1c  Hidden W95 FAT3 75  PC/IX      bc  Acronis FAT32 L fe  LANstep
1e  Hidden W95 Fati 80  Old Minix  be  Solaris boot      ff  BBI
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.
```

File Edit View Search Terminal Help

root@servera ~#

A screenshot of a Red Hat Linux desktop environment. A terminal window is open, showing the following command sequence:

```
File Edit View Search Terminal Help
First sector (6293504-10485759, default 6293504):
Last sector, +sectors or +size(K,M,G,T,P) (6293504-10485759, default 10485759): +1G
Created a new partition 3 of type 'Linux' and of size 1 GiB.

Command (m for help): t
Partition number (1-4, default 4): 3
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@servera ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vda 252:0 0 10G 0 disk
└─vda1 252:1 0 1M 0 part /boot/efi
vda2 252:2 0 100M 0 part /boot/efi
└─vda3 252:3 0 9.9G 0 part /
vdb 252:16 0 5G 0 disk
└─vdb1 252:17 0 1G 0 part
└─vdb2 252:18 0 1G 0 part
└─vdb3 252:19 0 1G 0 part
└─vdb4 252:20 0 1G 0 part
vdc 252:32 0 5G 0 disk
vdd 252:48 0 5G 0 disk
[root@servera ~]#
```

Now to create a physical volume use

pvcreate /dev/vdb1 /dev/vdb2 /dev/vdb3 /dev/vdb4

To display physical volume

pvdisplay

A screenshot of a Red Hat Linux desktop environment. A terminal window is open, showing the following command sequence:

```
File Edit View Search Terminal Help
[root@servera ~]# pvcreate /dev/vdb1
vdb1
[root@servera ~]# pvcreate /dev/vdb1 /dev/vdb2 /dev/vdb3 /dev/vdb4
Physical volume "/dev/vdb1" successfully created.
Physical volume "/dev/vdb2" successfully created.
Physical volume "/dev/vdb3" successfully created.
Physical volume "/dev/vdb4" successfully created.
[root@servera ~]# pvdisplay
"/dev/vdb1" is a new physical volume of "1.00 GiB"
-- NEW Physical volume --
PV Name           /dev/vdb1
VG Name
PV Size          1.00 GiB
Allocatable       NO
PE Size
Total PE
Free PE
Allocated PE
PV UUID          sRqZvq-vj6l-Zj34-lWfn-juvi-H0bR-t9B9CB
"/dev/vdb2" is a new physical volume of "1.00 GiB"
-- NEW Physical volume --
PV Name           /dev/vdb2
VG Name
PV Size          1.00 GiB
Allocatable       NO
PE Size
Total PE
Free PE
Allocated PE
```

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

To create a volume group pool :

vgcreate yagna /dev/vdb1 /dev/vdb2 /dev/vdb3 /dev/vdb4

Here **yagna** is the **name of the volume group** and **/dev/vdb1-4** are the **physical volumes**

Now using **pvdisplay** we can check the **VG Name** which should be the volume group name

```
[root@server ~]# vgcreate yagna /dev/vdb1 /dev/vdb2 /dev/vdb3 /dev/vdb4
Volume group "yagna" successfully created
[root@server ~]# pvdisplay
  --- Physical volume ---
  PV Name        /dev/vdb1
  VG Name        yagna
  PV Size       1.00 GiB / not usable 4.00 MiB
  Allocatable   yes
  PE Size        4.00 MiB
  Total PE      255
  Free PE       255
  Allocated PE  0
  PV UUID       sRqZvq-yj6l-Zj34-lWfn-juvi-HObR-t9B9CB

  --- Physical volume ---
  PV Name        /dev/vdb2
  VG Name        yagna
  PV Size       1.00 GiB / not usable 4.00 MiB
  Allocatable   yes
  PE Size        4.00 MiB
  Total PE      255
  Free PE       255
  Allocated PE  0
  PV UUID       3filok-MXn2-hRKG-11rE-IQvd-dabc-ies05t

  --- Physical volume ---
  PV Name        /dev/vdb3
  VG Name        yagna
  PV Size       1.00 GiB / not usable 4.00 MiB
  Allocatable   yes
```

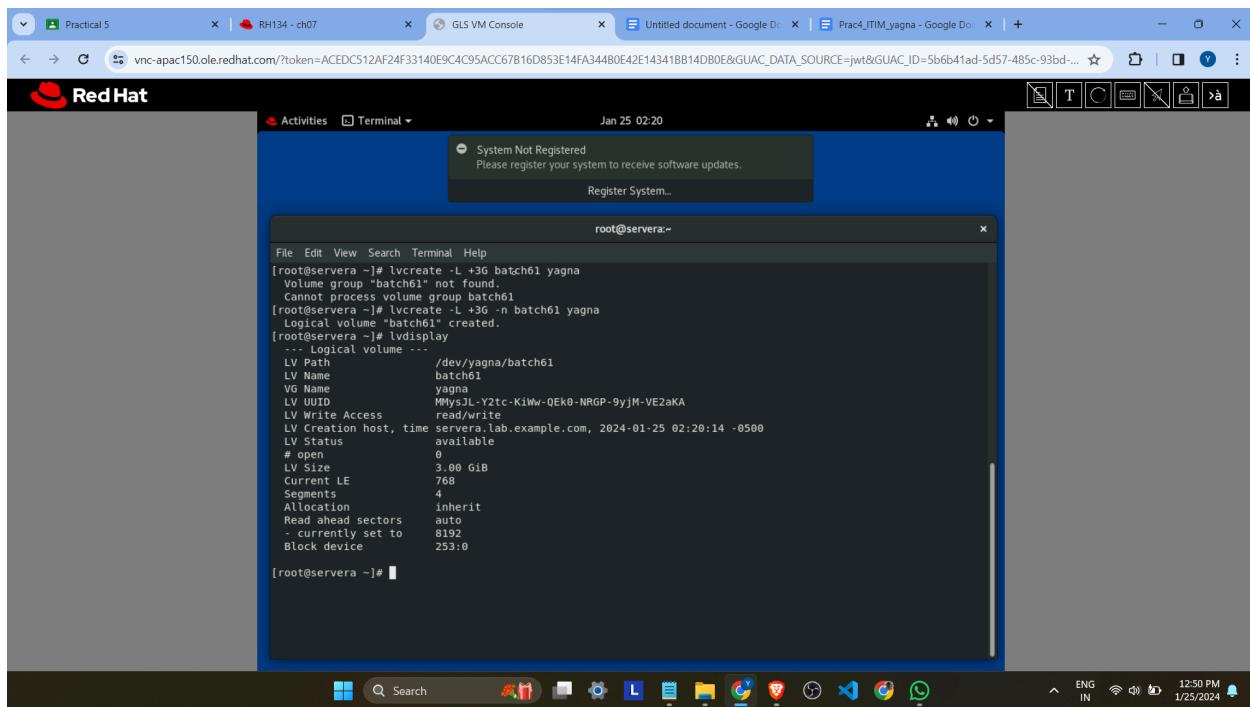
3) Logical volume size must be greater than 2 GB, name of the logical volume must be batch61

lvcreate -L +3G -n batch61 yagna to create logical volume

Here **-L** is used to give the **size of logical volume**

-n is used to give **name of the logical volume** followed by volume group name

lvdisplay to display details of Logical volume

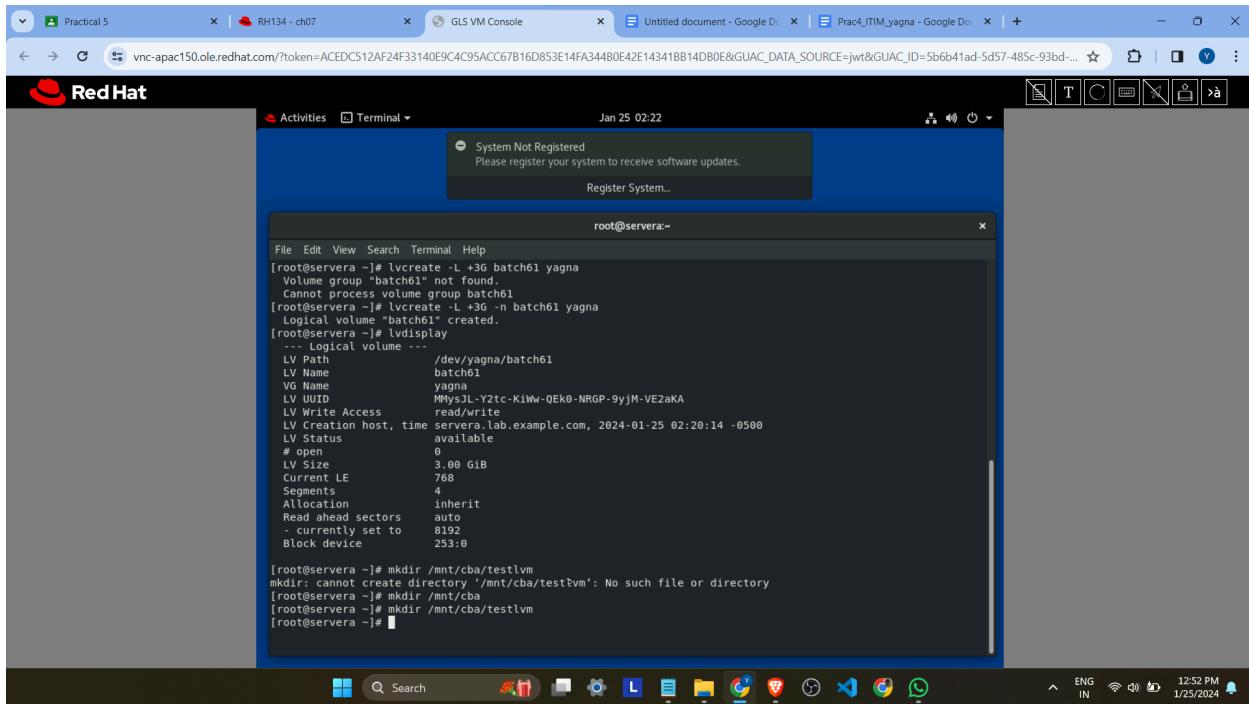


The screenshot shows a Red Hat Linux desktop environment. A terminal window titled 'root@servera:' is open, displaying the output of the 'lvdisplay' command. The output shows the creation of a logical volume 'batch61' from the 'yagna' volume group, with a size of 3.00 GiB and a block device at 253:0.

```
[root@servera ~]# lvcreate -L +3G -n batch61 yagna
Volume group "batch61" not found.
Cannot process volume group batch61
[root@servera ~]# lvcreate -L +3G -n batch61 yagna
Logical volume "batch61" created.
[root@servera ~]# lvdisplay
-- Logical volume --
LV Path          /dev/yagna/batch61
LV Name          batch61
VG Name          yagna
LV UUID          MMyzJL-Y2tc-KiWw-QEk0-NRGp-9yjM-VE2aKA
LV Write Access  read/write
LV Creation host, time servera.lab.example.com, 2024-01-25 02:20:14 -0500
LV Status        available
# open           0
LV Size          3.00 GiB
Current LE      768
Segments         4
Allocation       inherit
Read ahead sectors auto
- currently set to 8192
Block device    253:0
[root@servera ~]#
```

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

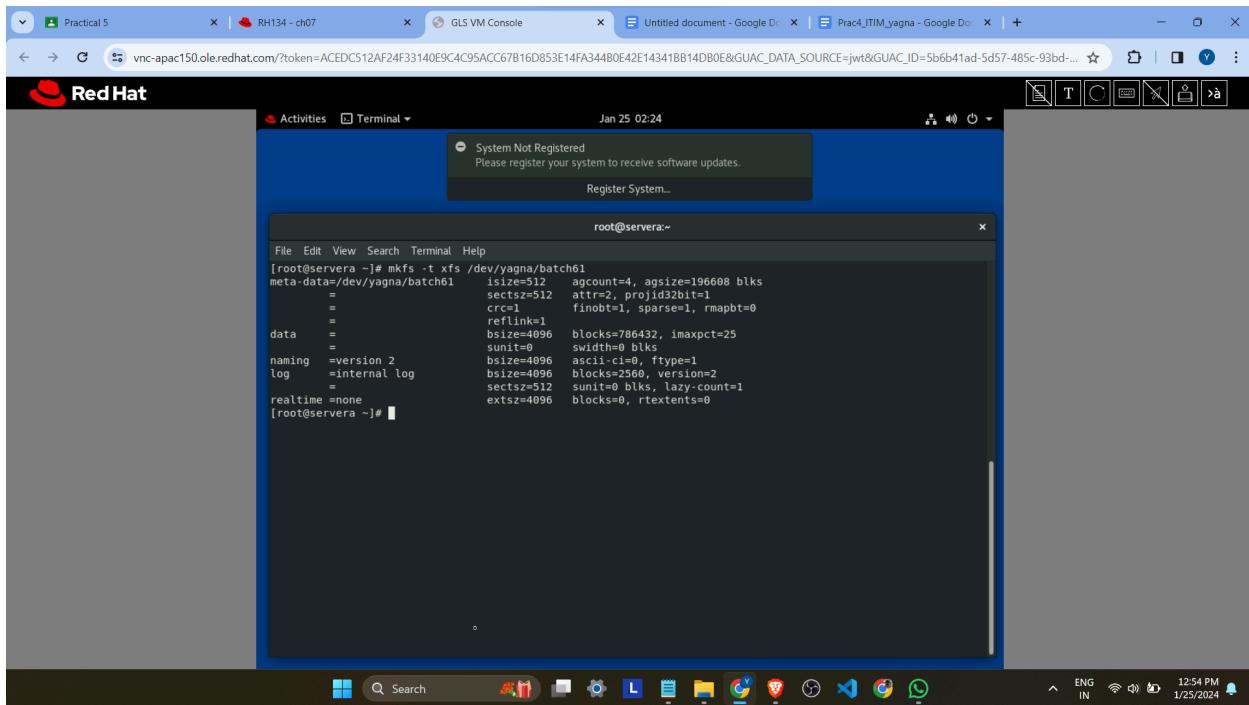
- Create a directory /mnt/cba/testlvm using `mkdir /mnt/cba/testlvm`



```
[root@servera ~]# lvcreate -L +30 batch61 yagna
Volume group "batch61" not found.
Cannot process volume group batch61
[root@servera ~]# lvcreate -L +30 -n batch61 yagna
Logical volume "batch61" created.
[root@servera ~]# lvdisplay
--- Logical volume ---
LV Path          /dev/yagna/batch61
LV Name          batch61
VG Name          yagna
LV UUID          MMyJL-Y2tc-KiWw-QEk0-NRGp-9yJM-VE2aKA
LV Write Access  read/write
LV Creation host, time servera.lab.example.com, 2024-01-25 02:20:14 -0500
LV Status        available
LV Size          3.00 GiB
# open           0
Current LE      768
Segments         4
Allocation       inherit
Read ahead sectors auto
- currently set to 8192
Block device    253:0

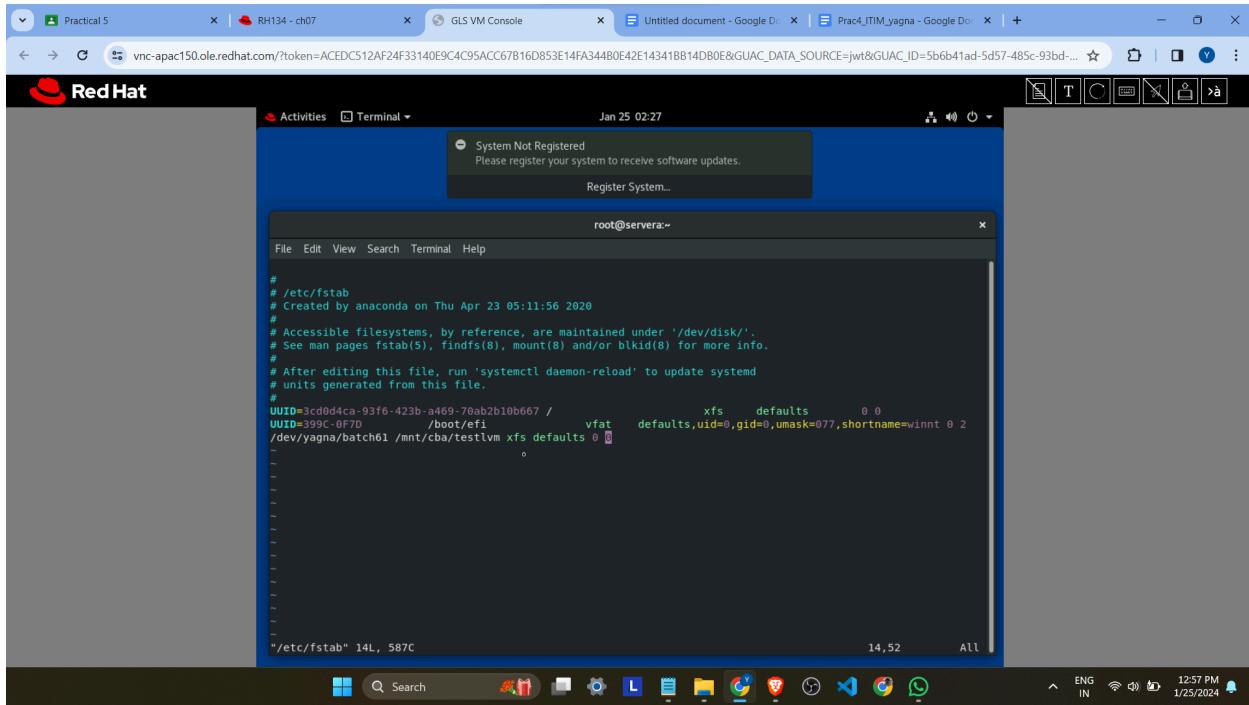
[root@servera ~]# mkdir /mnt/cba/testlvm
mkdir: cannot create directory '/mnt/cba/testlvm': No such file or directory
[root@servera ~]# mkdir /mnt/cba/batch61
[root@servera ~]#
```

- Assign file system xfs to logical volume using `mkfs -t xfs /dev/yagna/batch61` where xfs is the file system batch61 is the logical volume



```
[root@servera ~]# mkfs -t xfs /dev/yagna/batch61
meta-data=/dev/yagna/batch61 isize=512 agcount=4, agsize=196608 blks
          = sectsz=512 attr=2, projid32bit=1
          = crc=1   finobt=1, sparse=1, rmapbt=0
          = reflink=1
data     = bsize=4096 blocks=786432, imaxpct=25
          = sunit=8 swidth=8 blks
naming  =version 2 bsize=4096 blocks=2560, version=2
log     =internal log bsize=4096 sectsz=512 sunit=8 blks, lazy-count=1
realtime =none extsz=4096 blocks=0, rtextents=0
[root@servera ~]#
```

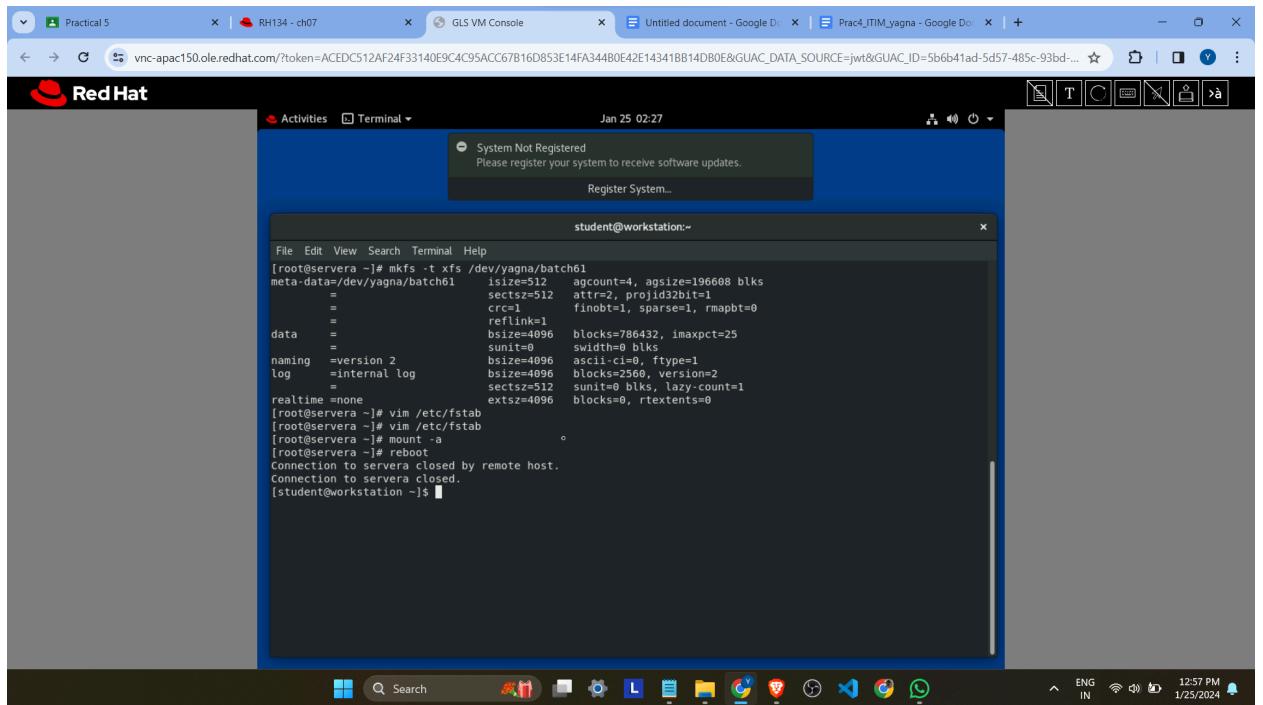
- Enter the logical volume in the /etc/fstab file :
/dev/yagna/batch61 /mnt/cba/testlvm xfs defaults 0 0 where batch61 is logical volume
 testlvm is the directory to mount, xfs as file system



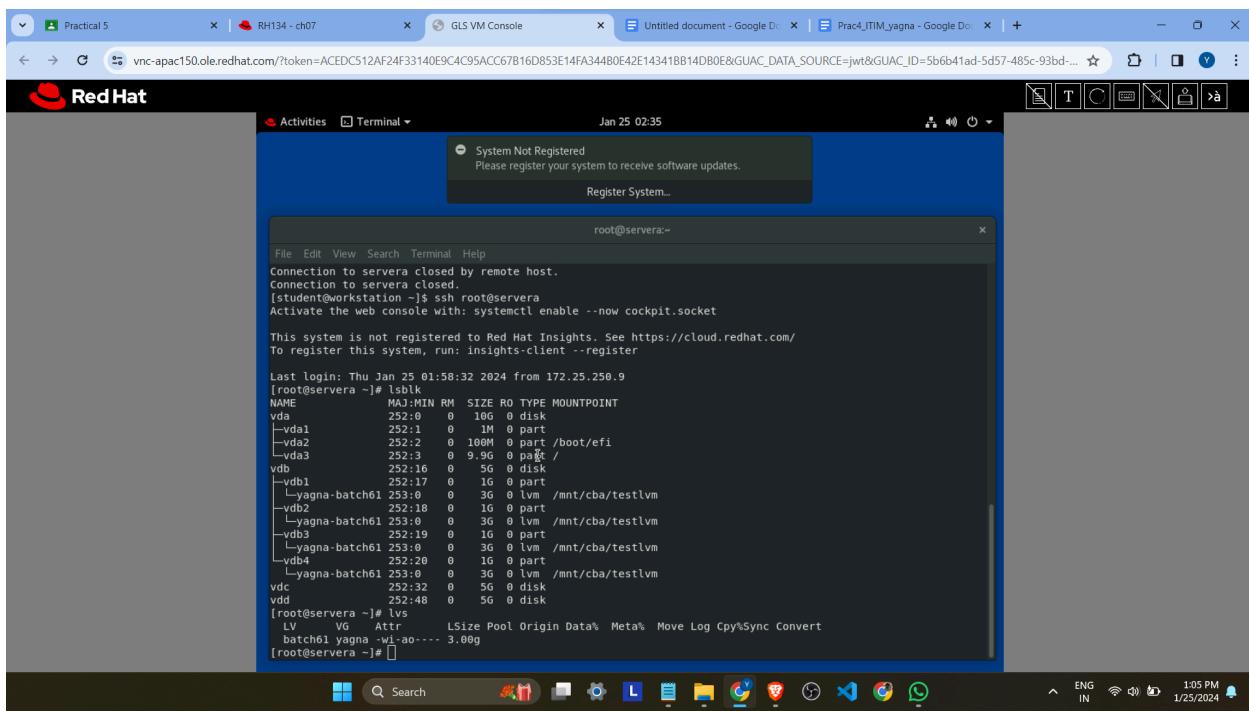
```
# /etc/fstab
# Created by anaconda on Thu Apr 23 05:11:56 2020
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
UUID=3cd0d4ca-93f6-423b-a469-70ab2b10b667 /          xfs      defaults        0 0
UUID=399c-0f70 /boot/efi   vfat    defaults,uid=0,gid=0,umask=077,shortname=winnt 0 2
/dev/yagna/batch61 /mnt/cba/testlvm xfs defaults 0 0

```

- Now mount the logical volume using **mount -a** where -a means all. Reboot the server and check the partitions



```
[root@servera ~]# mkfs -t xfs /dev/yagna/batch61
meta-data=/dev/yagna/batch61 isize=512   agcount=4, agsize=196608 blks
          = sectsz=512  attr=2, projid32bit=1
          = crc=1       finobt=1, sparse=1, rmapbt=0
          = reflink=1
data     = bsize=4096   blocks=786432, imaxpct=25
          = sunit=64     swidth=160blks
naming   =version 2
log      =internal log bsize=4096   blocks=2560, version=2
          = sectsz=512  sunit=8 blks, lazy-count=1
realtime spnone extsz=4096   blocks=0, rtextents=0
[root@servera ~]# vim /etc/fstab
[root@servera ~]# vim /etc/fstab
[root@servera ~]# mount -a
[root@servera ~]# reboot
Connection to servera closed by remote host.
Connection to servera closed.
[student@workstation ~]$
```



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

pvdisplay or **pvs** - to check physical volume details and their volume group name

vgdisplay or **vgs** - to get details about the volume groups

lvdisplay - to get details about the logical volumes

lvs - to get logical volume with their volume group and logical volume size

6) Demonstrate how you can remove all logical volume.

First we remove entry from the fstab file with

Command : **vim /etc/fstab**

Now we unmount volumes from directory /mnt/cba/testlvm with

Command : **umount /dev/yagna/batch61 /mnt/cba/testlvm**

Then now we remove logical volume with

Command : **lvremove /dev/yagna/batch61**

Now we delete volume groups with

Command: **vgremove yagna**

Then delete the physical volumes with

Command : **pvremove /dev/vdb1**

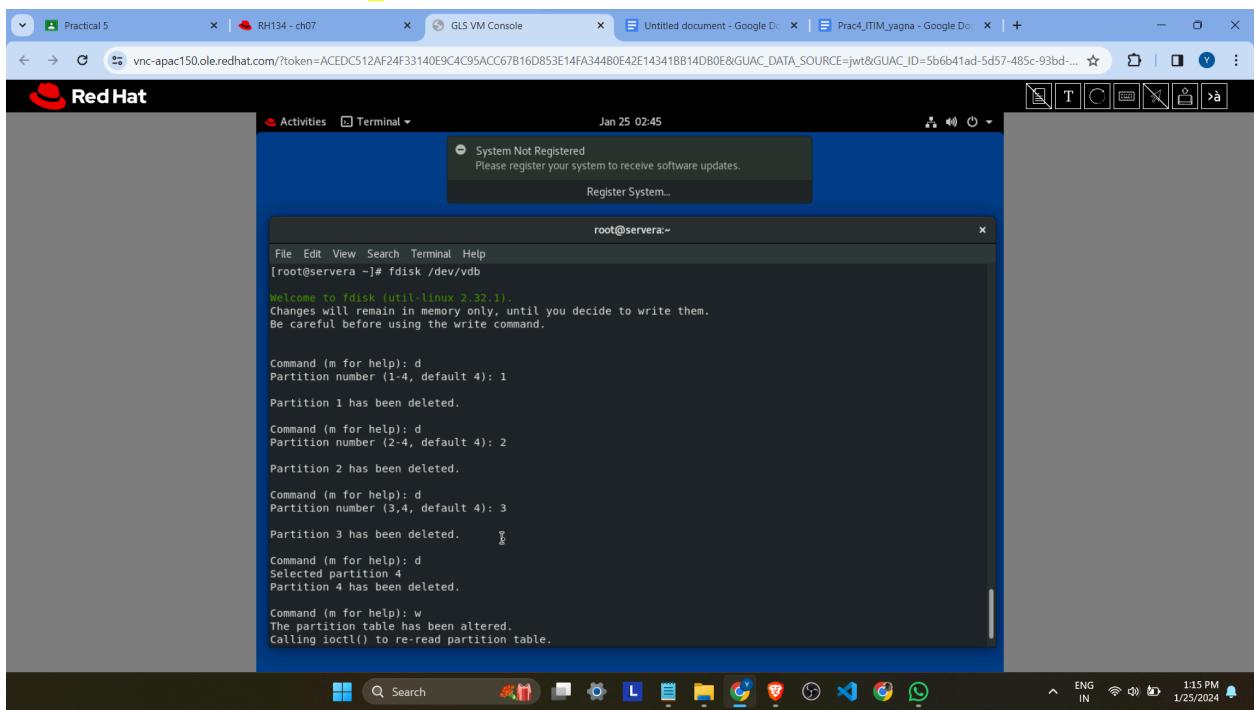
The screenshot shows a Red Hat Linux desktop environment. A terminal window is open with the following command history:

```
[root@servera ~]# lvremove batch61
Volume group "batch61" not found.
[root@servera ~]# lvremove -n batch61
lvremove: invalid option `--'
[option -- is not a valid option of command line.
[root@servera ~]# lvremove /dev/yagna/batch61
Do you really want to remove active logical volume yagna/batch61? [y/n]: y
Logical volume "batch61" successfully removed
[root@servera ~]# vgremove yagna
Volume group "yagna" successfully removed
[root@servera ~]# pvremove /dev/vdb1
Labels on physical volume "/dev/vdb1" successfully wiped.
[root@servera ~]# pvremove /dev/vdb2
Labels on physical volume "/dev/vdb2" successfully wiped.
[root@servera ~]# pvremove /dev/vdb3
Labels on physical volume "/dev/vdb3" successfully wiped.
[root@servera ~]# pvremove /dev/vdb4
Labels on physical volume "/dev/vdb4" successfully wiped.
[root@servera ~]#
```

Than we delete all the 4 partitions one by one with

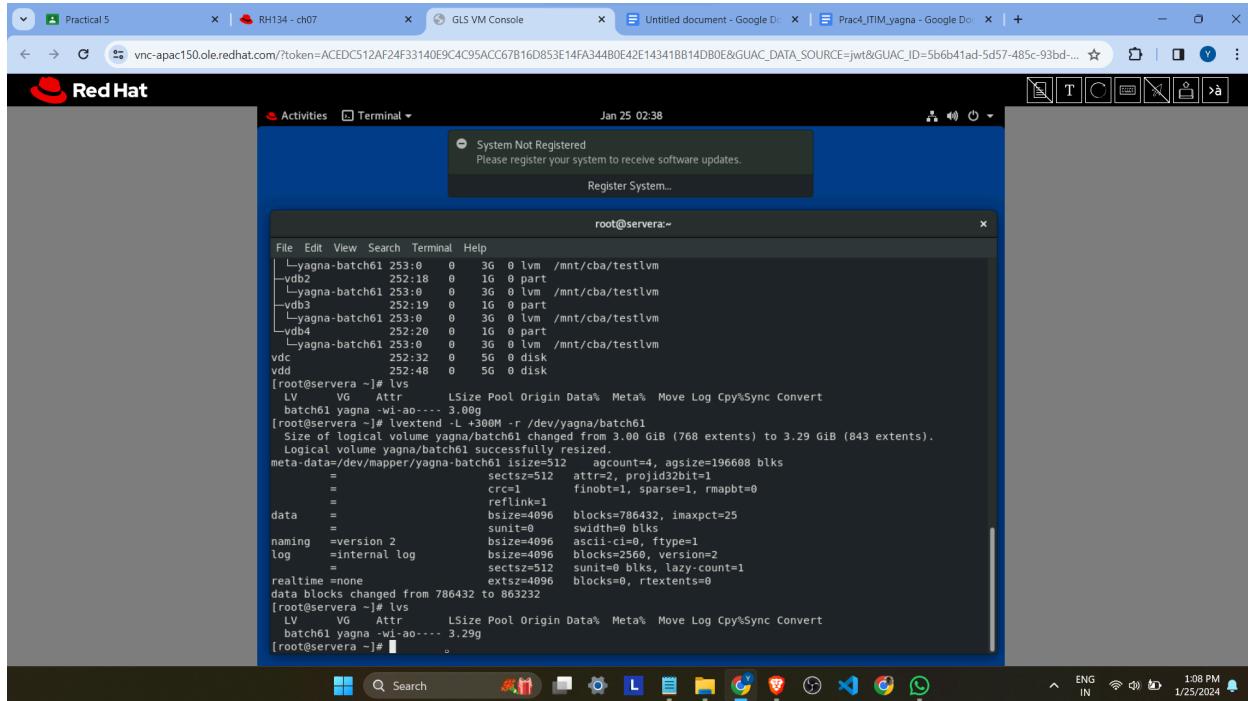
Command : **fdisk /dev/vdb**

Than we delete partition with **d**



7) Extend 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.

Command : `lvextend -L +300M -r /dev/yagna/batch61`



The screenshot shows a Red Hat Linux desktop environment. A terminal window is open, displaying the following command and its output:

```
[root@servera ~]# lvextend -L +300M -r /dev/yagna/batch61
Size of logical volume yagna/batch61 changed from 3.00 GiB (768 extents) to 3.29 GiB (843 extents).
Logical volume yagna/batch61 successfully resized.
```

Below the terminal, the desktop environment includes a taskbar with various icons and a system tray at the bottom right showing network and battery status.