Report: LVM Setup and Extension

---

1. Objective

To create and manage logical volumes by:

- Created a new **LVM partition** (`8e`) on `/dev/sdb`.
- Created a **Physical Volume** (`pvcreate /dev/sdb1`).
- Created a **Volume Group** `vgapps`.
- Created two **Logical Volumes** `app1-lv` and `app2-lv` inside `vgapps`.
- Formatted both logical volumes with the **ext4 filesystem**.

- Extending VG with an additional disk
- Extending a Logical Volume and resizing the filesystem

2. Initial Setup

Environment: Linux Server (example: CentOS, RHEL, Ubuntu) Tools: `fdisk`, `pvcreate`, `vgcreate`, `lvcreate`, `vgextend`, `lvextend`, `resize2fs`

3. Step-by-Step Tasks

Step 1: Creating and Partitioning /dev/sdb

- Added a new disk `/dev/sdb`.
- Created a partition `/dev/sdb1` using `fdisk`:

root@poepict:/home/pratik# fdisk /dev/sdb

```
Welcome to fdisk (util-linux 2.37.2).
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.
Created a new DOS disklabel with disk identifier 0x8cf56aab.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1):
First sector (2048-4194303, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-4194303, default 4194303):

Created a new partition 1 of type 'Linux' and of size 2 GiB.

Command (m for help): t
Selected partition 1
Hex code or alias (type L to list all): L

00 Empty            24 NEC DOS          81 Minix / old Lin  bf Solaris
01 FAT12            27 Hidden NTFS Win  82 Linux swap / So  c1 DRDOS/sec (FAT-
02 XENIX root       39 Plan 9           83 Linux            c4 DRDOS/sec (FAT-
03 XENIX usr        3c PartitionMagic   84 OS/2 hidden or   c6 DRDOS/sec (FAT-
04 FAT16 <32M       40 Venix 80286      85 Linux extended   c7 Syrinx
05 Extended         41 PPC PReP Boot    86 NTFS volume set  da Non-FS data
06 FAT16            42 SFS              87 NTFS volume set  db CP/M / CTOS / .
07 HPFS/NTFS/exFAT  4d QNX4.x           88 Linux plaintext  de Dell Utility
08 AIX              4e QNX4.x 2nd part  8e Linux LVM        df BootIt
09 AIX bootable     4f QNX4.x 3rd part  93 Amoeba           e1 DOS access
```

```
0a OS/2 Boot Manag  50 OnTrack DM       94 Amoeba BBT       e3 DOS R/O
0b W95 FAT32        51 OnTrack DM6 Aux  9f BSD/OS           e4 SpeedStor
0c W95 FAT32 (LBA)  52 CP/M             a0 IBM Thinkpad hi  ea Linux extended
0e W95 FAT16 (LBA)  53 OnTrack DM6 Aux  a5 FreeBSD          eb BeOS fs
0f W95 Ext'd (LBA)  54 OnTrackDM6       a6 OpenBSD          ee GPT
10 OPUS             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 Netware   b7 BSDI fs          fb VMware VMFS
18 AST SmartSleep   65 Novell Netware   b8 BSDI 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 FAT1  80 Old Minix        be Solaris boot     ff BBT

Aliases:
   linux          - 83
   swap           - 82
   extended       - 05
   uefi           - EF
   raid           - FD
   lvm            - 8E
   linuxex        - 85
Hex code or alias (type L to list all): 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@poepict:/home/pratik#
root@poepict:/home/pratik# fdisk -l


Disk /dev/sda: 50 GiB, 53687091200 bytes, 104857600 sectors
Disk model: VMware Virtual S
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: gpt
Disk identifier: 0D20D28E-24B0-433E-B443-76F81F72162B
```

```
Device       Start       End   Sectors  Size Type
/dev/sda1     2048      4095      2048    1M BIOS boot
/dev/sda2     4096   1054719   1050624  513M EFI System
/dev/sda3  1054720 104855551 103800832 49.5G Linux filesystem


Disk /dev/sdb: 2 GiB, 2147483648 bytes, 4194304 sectors
Disk model: VMware Virtual S
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: 0x8cf56aab

Device     Boot Start     End Sectors Size Id Type
/dev/sdb1        2048 4194303 4192256   2G 8e Linux LVM
```

Step 2: Creating Physical Volume, Volume Group, and Logical Volumes

root@poepict:/home/pratik# pvcreate /dev/sdb1

```
  Physical volume "/dev/sdb1" successfully created.
```

root@poepict:/home/pratik# pvdisplay

```
  "/dev/sdb1" is a new physical volume of "<2.00 GiB"
  --- NEW Physical volume ---
  PV Name               /dev/sdb1
  VG Name
  PV Size               <2.00 GiB
  Allocatable           NO
  PE Size               0
  Total PE              0
  Free PE               0
  Allocated PE          0
  PV UUID               WzSFkt-t57n-iykF-xLDq-2gVH-qY7H-IufIKu
```

root@poepict:/home/pratik# vgcreate vgapps /dev/sdb1

```
  Volume group "vgapps" successfully created
```

```
root@poepict:/home/pratik# vgdisplay
  --- Volume group ---
  VG Name               vgapps
  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               <2.00 GiB
  PE Size               4.00 MiB
  Total PE              511
  Alloc PE / Size       0 / 0
  Free  PE / Size       511 / <2.00 GiB
  VG UUID               aF0LZF-KcOZ-CFnO-k6Pq-fHNZ-19IR-GFxr9B
```

root@poepict:/home/pratik# lvcreate -L 1000M -n app1-lv vgapps

```
  Logical volume "app1-lv" created.
```

root@poepict:/home/pratik# lvcreate -L 1000M -n app2-lv vgapps

```
  Logical volume "app2-lv" created.
```

root@poepict:/home/pratik# lvdisplay | more

```
  --- Logical volume ---
  LV Path                /dev/vgapps/app1-lv
  LV Name                app1-lv
  VG Name                vgapps
```

```
LV UUID                iDwFhc-MJQp-5I7X-8uW2-kNsU-TzHd-irl8hC
LV Write Access        read/write
LV Creation host, time poepict, 2025-04-28 11:53:37 +0530
LV Status              available
# open                 0
LV Size                1000.00 MiB
Current LE             250
Segments               1
Allocation             inherit
Read ahead sectors     auto
- currently set to     256
Block device           252:0

--- Logical volume ---
LV Path                /dev/vgapps/app2-lv
LV Name                app2-lv
VG Name                vgapps
LV UUID                xT1tbP-feBn-N7hZ-aAHN-ziD8-bQzK-dvCRby
LV Write Access        read/write
LV Creation host, time poepict, 2025-04-28 11:53:55 +0530
LV Status              available
# open                 0
LV Size                1000.00 MiB
Current LE             250
Segments               1
Allocation             inherit
Read ahead sectors     auto
- currently set to     256
Block device           252:1
```

Step 3: Adding filesystem ext4 on logical volume and then mount them.

root@poepict:/home/pratik# mkfs.ext4 /dev/vgapps/app1-lv

```
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 256000 4k blocks and 64000 inodes
Filesystem UUID: 9e78e878-1497-4e0e-ae72-a85fff54a316
Superblock backups stored on blocks:
```

32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

root@poepict:/home/pratik# mkfs.ext4 /dev/vgapps/app2-lv
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 256000 4k blocks and 64000 inodes
Filesystem UUID: a040a263-5494-4e10-b9e0-80fc9d363e72
Superblock backups stored on blocks:
32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

For monuting to a specific folder or directory to store files :-

✅ **Create Mount Points**:

bash
CopyEdit
```
mkdir /app1
mkdir /app2
```

root@poepict:/home/pratik# mkdir /app1
root@poepict:/home/pratik# mkdir /app2

✅ **Mount the Logical Volumes**:

bash
CopyEdit
```
mount /dev/vgapps/app1-lv /app1
```

```
mount /dev/vgapps/app2-lv /app2
```

root@poepict:/home/pratik# mount /dev/vgapps/app1-lv /app1/
root@poepict:/home/pratik# mount /dev/vgapps/app2-lv /app2/

✅ **Check with**:

bash
CopyEdit
```
df -h
```

root@poepict:/home/pratik# df -Th

```
Filesystem              Type     Size  Used Avail Use% Mounted on
tmpfs                   tmpfs    387M  2.1M  385M   1% /run
/dev/sda3               ext4      49G   15G   32G  32% /
tmpfs                   tmpfs    1.9G     0  1.9G   0% /dev/shm
tmpfs                   tmpfs    5.0M  4.0K  5.0M   1% /run/lock
/dev/sda2               vfat     512M  6.1M  506M   2% /boot/efi
tmpfs                   tmpfs    387M  120K  387M   1% /run/user/1000
/dev/sr1                iso9660  4.7G  4.7G     0 100% /media/pratik/Ubuntu 22.04.4 LTS amd64
/dev/sr0                iso9660  152M  152M     0 100% /media/pratik/CDROM
/dev/mapper/vgapps-app1--lv ext4     966M   24K  900M   1% /app1
/dev/mapper/vgapps-app2--lv ext4     966M   24K  900M   1% /app2
```

You should see `/app1` and `/app2` mounted.

✅ **Make Mounts Permanent (After Reboot)**: Edit `/etc/fstab` and add entries like:

bash
CopyEdit
```
/dev/vgapps/app1-lv   /app1   ext4    defaults    0 0
/dev/vgapps/app2-lv   /app2   ext4    defaults    0 0
```

(Be very careful editing `/etc/fstab`; wrong entries can break boot.)

root@poepict:/home/pratik# cat /etc/mtab

tmpfs /run/snapd/ns tmpfs rw,nosuid,nodev,noexec,relatime,size=396136k,mode=755,inode64 0 0
nsfs /run/snapd/ns/snapd-desktop-integration.mnt nsfs rw 0 0
/dev/sr1 /media/pratik/Ubuntu\04022.04.4\040LTS\040amd64 iso9660 ro,nosuid,nodev,relatime,nojoliet,check=s,map=n,blocksize=2048,uid=1000,gid=1000,dmode=500,fmode=400,iocharset=utf8 0 0
/dev/sr0 /media/pratik/CDROM iso9660 ro,nosuid,nodev,relatime,nojoliet,check=s,map=n,blocksize=2048,uid=1000,gid=1000,dmode=500,fmode=400,iocharset=utf8 0 0
nsfs /run/snapd/ns/snap-store.mnt nsfs rw 0 0
/dev/mapper/vgapps-app1--lv /app1 ext4 rw,relatime 0 0
/dev/mapper/vgapps-app2--lv /app2 ext4 rw,relatime 0 0
Here the showing

//add that last 2 lines in /etc/fstab to save changes permontly in linux otherwise this changes reoved after restarting the machine...

root@poepict:/home/pratik# vim /etc/fstab

root@poepict:/home/pratik#
root@poepict:/home/pratik# here we edit the file ans added that two lines.
root@poepict:/home/pratik#

root@poepict:/home/pratik# mount -av

/ : ignored
/boot/efi : already mounted
none : ignored
/media/floppy0 : ignored
/app1 : already mounted
/app2 : already mounted
root@poepict:/home/pratik#

NOW we need to extend the lvm on app2 and extend app2-lv for that we are adding another hard disk of 1 gb

Step 3: Adding /dev/sdc and Extending the VG

- Added a new disk `/dev/sdc` (size 1GB).
- Created a partition `/dev/sdc1`:
- Created Physical Volume: pvcreate /dev/sdc1
- Extended Volume Group: vgextend vgapps /dev/sdc1

root@poepict:/home/pratik# fdisk -l | more
Disk /dev/sda: 50 GiB, 53687091200 bytes, 104857600 sectors
Disk model: VMware Virtual S
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: gpt
Disk identifier: 0D20D28E-24B0-433E-B443-76F81F72162B

Device	Start	End	Sectors	Size	Type
/dev/sda1	2048	4095	2048	1M	BIOS boot
/dev/sda2	4096	1054719	1050624	513M	EFI System
/dev/sda3	1054720	104855551	103800832	49.5G	Linux filesystem

Disk /dev/sdb: 2 GiB, 2147483648 bytes, 4194304 sectors
Disk model: VMware Virtual S
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: 0x8cf56aab

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sdb1		2048	4194303	4192256	2G	8e	Linux LVM

Disk /dev/sdc: 1 GiB, 1073741824 bytes, 2097152 sectors **//now created harddisk**
Disk model: VMware Virtual S
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mapper/vgapps-app1--lv: 1000 MiB, 1048576000 bytes, 2048000 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/mapper/vgapps-app2--lv: 1000 MiB, 1048576000 bytes, 2048000 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes **now we extended this logical volume from 1 gb to 2 gb**

root@poepict:/home/pratik#
root@poepict:/home/pratik# fdisk /dev/sdc

Welcome to fdisk (util-linux 2.37.2).
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.
Created a new DOS disklabel with disk identifier 0xfefdb74e.

Command (m for help): n
Partition type
  p primary (0 primary, 0 extended, 4 free)
  e extended (container for logical partitions)

```
Select (default p): p
Partition number (1-4, default 1):
First sector (2048-2097151, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-2097151, default 2097151):

Created a new partition 1 of type 'Linux' and of size 1023 MiB.

Command (m for help): t
Selected partition 1
Hex code or alias (type L to list all): 8E
Changed type of partition 'Linux' to 'Linux LVM'.

Command (m for help): p
Disk /dev/sdc: 1 GiB, 1073741824 bytes, 2097152 sectors
Disk model: VMware Virtual S
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: 0xfefdb74e

Device     Boot Start     End Sectors  Size Id Type
/dev/sdc1        2048 2097151 2095104 1023M 8e Linux LVM

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
```

root@poepict:/home/pratik#
root@poepict:/home/pratik# pvcreate /dev/sdc1
  Physical volume "/dev/sdc1" successfully created.

Step 4: Extending volume group and Logical Volume apps2

- Extended Logical Volume `apps2` to 2GB:

root@poepict:/home/pratik#

root@poepict:/home/pratik# vgextend vgapps /dev/sdc1

Volume group "vgapps" successfully extended

root@poepict:/home/pratik# lvextend -L+1000M /dev/vgapps/app2-lv

Size of logical volume vgapps/app2-lv changed from 1000.00 MiB (250 extents) to 1.95 GiB (500 extents).

Logical volume vgapps/app2-lv successfully resized.

- Resized the filesystem:

root@poepict:/home/pratik# resize2fs /dev/vgapps/apps2-lv 2G //error limited space.

resize2fs 1.46.5 (30-Dec-2021)
open: No such file or directory while opening /dev/vgapps/apps2-lv
root@poepict:/home/pratik# resize2fs /dev/vgapps/app2-lv 2G
resize2fs 1.46.5 (30-Dec-2021)
The containing partition (or device) is only 512000 (4k) blocks.
You requested a new size of 524288 blocks.

root@poepict:/home/pratik# resize2fs /dev/vgapps/app2-lv 2000M /

resize2fs 1.46.5 (30-Dec-2021)
Filesystem at /dev/vgapps/app2-lv is mounted on /app2; on-line resizing required
old_desc_blocks = 1, new_desc_blocks = 1
The filesystem on /dev/vgapps/app2-lv is now 512000 (4k) blocks long.

root@poepict:/home/pratik# df -h

Filesystem	Size	Used	Avail	Use%	Mounted on
tmpfs	387M	2.1M	385M	1%	/run
/dev/sda3	49G	15G	32G	32%	/
tmpfs	1.9G	0	1.9G	0%	/dev/shm

```
tmpfs                   5.0M  4.0K  5.0M   1% /run/lock
/dev/sda2                512M  6.1M  506M   2% /boot/efi
/dev/mapper/vgapps-app2--lv  2.0G   24K  1.9G   1% /app2       … size  od app2 is now 2 gb
/dev/mapper/vgapps-app1--lv  966M   24K  900M   1% /app1
tmpfs                   387M  108K  387M   1% /run/user/1000
/dev/sr0                 152M  152M     0 100% /media/pratik/CDROM
/dev/sr1                 4.7G  4.7G     0 100% /media/pratik/Ubuntu 22.04.4 LTS amd64
root@poepict:/home/pratik#
root@poepict:/home/pratik#
root@poepict:/home/pratik#
```

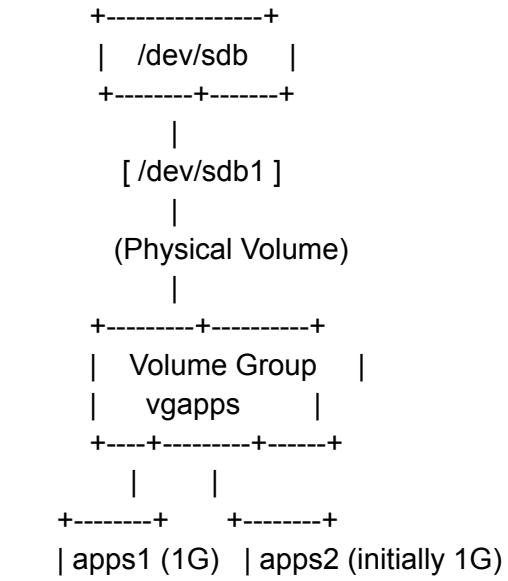
4. Important Commands Used

- `fdisk /dev/sdX` - Partition the disk
- `pvcreate /dev/sdX1` - Create Physical Volume
- `vgcreate vgname /dev/sdX1` - Create Volume Group
- `lvcreate -L Size -n lvname vgname` - Create Logical Volume
- `mkfs.ext4 /dev/vgname/lvname` - Create filesystem
- `vgextend vgname /dev/sdX1` - Extend VG
- `lvextend -L Size /dev/vgname/lvname` - Extend LV
- `resize2fs /dev/vgname/lvname` - Resize filesystem

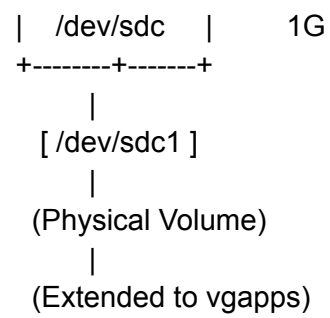
5. Best Practices & Tips

- Always take backups before resizing partitions or filesystems.
- After extending LV, do not forget to extend the filesystem (`resize2fs` for ext4).
- Always verify using `lsblk`, `vgs`, `lvs`, and `pvs`.

6. Simple Diagram



Added Later:



Final:

- apps2 extended to 2GB total size

root@poepict:/home/pratik# lsblk

```
NAME          MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS

sda             8:0    0    50G  0 disk
├─sda1          8:1    0     1M  0 part
├─sda2          8:2    0   513M  0 part /boot/efi
└─sda3          8:3    0  49.5G  0 part /var/snap/firefox/common/host-hunspell
                                       /
sdb             8:16   0     2G  0 disk
└─sdb1          8:17   0     2G  0 part
  ├─vgapps-app1--lv
  │           252:0    0  1000M  0 lvm  /app1
  └─vgapps-app2--lv
              252:1    0     2G  0 lvm  /app2
sdc             8:32   0     1G  0 disk
└─sdc1          8:33   0  1023M  0 part
  └─vgapps-app2--lv
              252:1    0     2G  0 lvm  /app2
```

7. Summary

You have successfully created and managed LVM storage:

- Created and partitioned two disks.
- Configured PV, VG, and LVs.
- Extended the storage dynamically.
- Resized filesystem successfully.

System is now ready for application data growth and better storage management.

Prepared by: Pratik

Date: 2025-04-28

Let's understand **carefully** — if you *extended* `apps2` logical volume (LV) using `/dev/sdc` (1 GB disk you added), and now you want to **remove** that extra space, here's the correct professional approach:

Step-by-Step: How to *safely* remove the extended part from `apps2`

⚡ **Important:** You **cannot directly "remove"** only the extended part. Logical volumes work like a pool — once extended, they merge into one.

You must:

1. **Backup important data** (always first step when shrinking anything).
2. **Shrink the filesystem** back to the original size.
3. **Reduce the Logical Volume**.
4. **Move Physical Extents (if needed)** off `/dev/sdc` using `pvmove`.
5. **Remove `/dev/sdc` from Volume Group (VG)**.
6. **Optionally delete the partition `/dev/sdc1`**.

Full Commands and Explanation:

Step 1: Check Current Setup

bash

CopyEdit

```
lsblk

df -h

vgs

lvs

pvs
```

(See where space is being used)

Step 2: Shrink File System inside apps2

Suppose you originally had `apps2` with 1 GB and you extended to 2 GB.
Now you want it back to 1 GB.

✅ First, **unmount** the filesystem:

bash

CopyEdit

```
umount /mount/point/of/apps2
```

✅ Check filesystem for errors (important step):

bash

CopyEdit

```
e2fsck -f /dev/mapper/centos-apps2
```

✅ Resize filesystem (example reducing back to 1GB):

bash

CopyEdit

```
resize2fs /dev/mapper/centos-apps2 1G
```

(Use exact original size carefully.)

Step 3: Reduce Logical Volume

After shrinking the filesystem:

bash

CopyEdit

```
lvreduce -L 1G /dev/centos/apps2
```

✅ Confirm size is now back to original.

Step 4: Move Data off `/dev/sdc`

If `/dev/sdc1` still has allocated extents:

bash

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```
pvmove /dev/sdc1
```

This command **moves data** from `/dev/sdc1` to other available disks in the VG (like `/dev/sdb1`).

> ⚡ *This might take time depending on data size.*

Step 5: Remove `/dev/sdc` from Volume Group

After `pvmove` is successful:

bash

CopyEdit

```
vgreduce centos /dev/sdc1
```

✅ Now `/dev/sdc1` is removed from your Volume Group.

Step 6: (Optional) Remove partition and disk `/dev/sdc`

If you want to clean up `/dev/sdc`:

bash

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```
fdisk /dev/sdc
```

- Delete the partition (d)
- Write changes (w)

Quick Diagram:

rust

CopyEdit

```
Before Removing

-----------------

/dev/sdb1 -> VG "centos" -> LV "apps1" + LV "apps2" (Extended)

/dev/sdc1 -> Added to VG "centos"


After Removing

-----------------

/dev/sdb1 -> VG "centos" -> LV "apps1" + LV "apps2" (Shrunk)

/dev/sdc1 -> Removed
```

⚡ Important Tips:

- Never shrink a mounted filesystem. Always unmount first.
- Always **take backup** before reducing.
- Double check the current size before applying `resize2fs` and `lvreduce`.

Practically

root@poepict:/home/pratik# vgs

```
  VG     #PV #LV #SN Attr   VSize VFree
  vgapps   2   2   0 wz--n- 2.99g 64.00m
```

root@poepict:/home/pratik# lvs

```
  LV      VG     Attr       LSize    Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
  app1-lv vgapps -wi-ao---- 1000.00m
  app2-lv vgapps -wi-ao----    1.95g
```

root@poepict:/home/pratik# pvs

```
  PV         VG     Fmt  Attr PSize    PFree
  /dev/sdb1  vgapps lvm2 a--    <2.00g     0
  /dev/sdc1  vgapps lvm2 a--  1020.00m 64.00m
```

root@poepict:/home/pratik# umount /app2
root@poepict:/home/pratik# lsblk

```
NAME           MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS

sda              8:0    0    50G  0 disk
├─sda1           8:1    0     1M  0 part
├─sda2           8:2    0   513M  0 part /boot/efi
└─sda3           8:3    0  49.5G  0 part /var/snap/firefox/common/host-hunspell
                                        /
sdb              8:16   0     2G  0 disk
└─sdb1           8:17   0     2G  0 part
  ├─vgapps-app1--lv
  │              252:0    0  1000M  0 lvm  /app1
  └─vgapps-app2--lv                                  /app2 is removed
                 252:1    0     2G  0 lvm
sdc              8:32   0     1G  0 disk
└─sdc1           8:33   0  1023M  0 part
  └─vgapps-app2--lv
                 252:1    0     2G  0 lvm
```

```
sr0             11:0    1 151.9M  0 rom  /media/pratik/CDROM
sr1             11:1    1   4.7G  0 rom  /media/pratik/Ubuntu 22.04.4 LTS amd64
```

root@poepict:/home/pratik# resize2fs /app2 1G   /ERror
resize2fs 1.46.5 (30-Dec-2021)
open: Is a directory while opening /app2
root@poepict:/home/pratik#
root@poepict:/home/pratik#
root@poepict:/home/pratik# resize2fs /dev/vgapps/app2-lv 1G
resize2fs 1.46.5 (30-Dec-2021)
Please run 'e2fsck -f /dev/vgapps/app2-lv' first.

root@poepict:/home/pratik# e2fsck -f /dev/vgapps/app2-lv
e2fsck 1.46.5 (30-Dec-2021)
Pass 1: Checking inodes, blocks, and sizes
Pass 2: Checking directory structure
Pass 3: Checking directory connectivity
Pass 4: Checking reference counts
Pass 5: Checking group summary information
/dev/vgapps/app2-lv: 11/128000 files (0.0% non-contiguous), 12890/512000 blocks
root@poepict:/home/pratik# resize2fs /dev/vgapps/app2-lv 1G
resize2fs 1.46.5 (30-Dec-2021)
Resizing the filesystem on /dev/vgapps/app2-lv to 262144 (4k) blocks.
The filesystem on /dev/vgapps/app2-lv is now 262144 (4k) blocks long.

root@poepict:/home/pratik#
root@poepict:/home/pratik# lvreduce -L 1G /dev/vgapps/app2-lv
  WARNING: Reducing active logical volume to 1.00 GiB.
  THIS MAY DESTROY YOUR DATA (filesystem etc.)
Do you really want to reduce vgapps/app2-lv? [y/n]: y
  Size of logical volume vgapps/app2-lv changed from 1.95 GiB (500 extents) to 1.00 GiB (256 extents).
  Logical volume vgapps/app2-lv successfully resized.

root@poepict:/home/pratik# lsblk

```
NAME          MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS

sda             8:0    0    50G  0 disk
├─sda1          8:1    0     1M  0 part
├─sda2          8:2    0   513M  0 part /boot/efi
└─sda3          8:3    0  49.5G  0 part /var/snap/firefox/common/host-hunspell
                                       /
sdb             8:16   0     2G  0 disk
└─sdb1          8:17   0     2G  0 part
  ├─vgapps-app1--lv
  │           252:0    0  1000M  0 lvm  /app1
  └─vgapps-app2--lv
              252:1    0     1G  0 lvm
sdc             8:32   0     1G  0 disk
└─sdc1          8:33   0  1023M  0 part
sr0            11:0    1 151.9M  0 rom  /media/pratik/CDROM
sr1            11:1    1   4.7G  0 rom  /media/pratik/Ubuntu 22.04.4 LTS amd64
```

root@poepict:/home/pratik# vgreduce vgapps /dev/sdc1
** Removed "/dev/sdc1" from volume group "vgapps"**