Assignment -1 Test Disk Performance IOPS With Fio utility for random read write operations
Instructions
Run this command:
fio --randrepeat=1 --ioengine-libaio --direct-1 --gtod_reduce=1 --name=test --filename=test
--bs=2k --iodepth=64 --size=2G --readwrite=randrw --rwmixread=75

A:

```
[pranay@localhost ~]$ fio --randrepeat=1 --ioengine=libaio --direct=1 --gtod_reduce=1 --name=test --filename=test --bs=2
4 --size=2G --readwrite=randrw --rwmixread=75
test: (g=0): rw=randrw, bs=(R) 2048B-2048B, (W) 2048B-2048B, (T) 2048B-2048B, ioengine=libaio, iodepth=64
fio-3.7
Starting 1 process
test: Laying out IO file (1 file / 2048MiB)
Jobs: 1 (f=1): [m(1)][99.6%][r=7249KiB/s,w=2532KiB/s][r=3624,w=1266 IOPS][eta 00m:01s]
test: (groupid=0, jobs=1): err= 0: pid=1500: Wed Aug 23 14:31:31 2023
   read: IOPS=3048, BW=6097KiB/s (6243kB/s)(1535MiB/257815msec)
    bw (  KiB/s): min=  609, max= 8100, per=99.91%, avg=6090.22, stdev=1225.45, samples=515
    iops        : min=  304, max= 4050, avg=3045.05, stdev=612.72, samples=515
  write: IOPS=1018, BW=2038KiB/s (2086kB/s)(513MiB/257815msec)
    bw (  KiB/s): min=  209, max= 2772, per=99.92%, avg=2035.28, stdev=421.58, samples=515
    iops        : min=  104, max= 1386, avg=1017.57, stdev=210.79, samples=515
  cpu          : usr=1.40%, sys=33.51%, ctx=412355, majf=2, minf=24
  IO depths    : 1=0.1%, 2=0.1%, 4=0.1%, 8=0.1%, 16=0.1%, 32=0.1%, >=64=100.0%
     submit    : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
     complete  : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.1%, >=64=0.0%
     issued rwts: total=785920,262656,0,0 short=0,0,0,0 dropped=0,0,0,0
     latency   : target=0, window=0, percentile=100.00%, depth=64

Run status group 0 (all jobs):
   READ: bw=6097KiB/s (6243kB/s), 6097KiB/s-6097KiB/s (6243kB/s-6243kB/s), io=1535MiB (1610MB), run=257815-257815msec
  WRITE: bw=2038KiB/s (2086kB/s), 2038KiB/s-2038KiB/s (2086kB/s-2086kB/s), io=513MiB (538MB), run=257815-257815msec

Disk stats (read/write):
  sda: ios=800939/262412, merge=5362/6, ticks=498932/60665, in_queue=558841, util=92.95%
```

—readwrite=randwrite

```
[pranay@localhost ~]$ fio --randrepeat=1 --ioengine=libaio --direct=1 --gtod_reduce=1 --name=test --filename=test --bs=2k
4 --size=2G --readwrite=randwrite --rwmixread=75
test: (g=0): rw=randwrite, bs=(R) 2048B-2048B, (W) 2048B-2048B, (T) 2048B-2048B, ioengine=libaio, iodepth=64
fio-3.7
Starting 1 process
Jobs: 1 (f=1): [w(1)][100.0%][r=0KiB/s,w=7771KiB/s][r=0,w=3885 IOPS][eta 00m:00s]
test: (groupid=0, jobs=1): err= 0: pid=1748: Wed Aug 23 14:57:47 2023
  write: IOPS=3696, BW=7394KiB/s (7571kB/s)(2048MiB/283638msec)
    bw (  KiB/s): min=  590, max=10948, per=99.97%, avg=7391.04, stdev=1675.47, samples=567
    iops        : min=  295, max= 5474, avg=3695.49, stdev=837.74, samples=567
  cpu          : usr=2.12%, sys=6.50%, ctx=1048583, majf=1, minf=27
  IO depths    : 1=0.1%, 2=0.1%, 4=0.1%, 8=0.1%, 16=0.1%, 32=0.1%, >=64=100.0%
     submit    : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
     complete  : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.1%, >=64=0.0%
     issued rwts: total=0,1048576,0,0 short=0,0,0,0 dropped=0,0,0,0
     latency   : target=0, window=0, percentile=100.00%, depth=64

Run status group 0 (all jobs):
  WRITE: bw=7394KiB/s (7571kB/s), 7394KiB/s-7394KiB/s (7571kB/s-7571kB/s), io=2048MiB (2147MB), run=283638-283638msec

Disk stats (read/write):
  sda: ios=49940/1049288, merge=7485/23712, ticks=236526/243706, in_queue=479975, util=85.04%
```

—readwrite=randread

```
[pranay@localhost ~]$ fio --randrepeat=1 --ioengine=libaio --direct=1 --gtod_reduce=1 --name=test --filename=test --bs=2k
4 --size=2G --readwrite=randread --rwmixread=75
test: (g=0): rw=randread, bs=(R) 2048B-2048B, (W) 2048B-2048B, (T) 2048B-2048B, ioengine=libaio, iodepth=64
fio-3.7
Starting 1 process
Jobs: 1 (f=1): [r(1)][100.0%][r=9.78MiB/s,w=0KiB/s][r=5008,w=0 IOPS][eta 00m:00s]
test: (groupid=0, jobs=1): err= 0: pid=1822: Wed Aug 23 15:03:04 2023
   read: IOPS=4185, BW=8370KiB/s (8571kB/s)(2048MiB/250554msec)
   bw (  KiB/s): min=  277, max= 5278, per=21.54%, avg=1803.30, stdev=469.56, samples=496
   iops        : min=  138, max= 2639, avg=901.40, stdev=234.79, samples=496
  cpu          : usr=4.06%, sys=58.96%, ctx=367760, majf=2, minf=96
  IO depths    : 1=0.1%, 2=0.1%, 4=0.1%, 8=0.1%, 16=0.1%, 32=0.1%, >=64=100.0%
     submit    : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
     complete  : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.1%, >=64=0.0%
     issued rwts: total=1048576,0,0,0 short=0,0,0,0 dropped=0,0,0,0
     latency   : target=0, window=0, percentile=100.00%, depth=64

Run status group 0 (all jobs):
   READ: bw=8370KiB/s (8571kB/s), 8370KiB/s-8370KiB/s (8571kB/s-8571kB/s), io=2048MiB (2147MB), run=250554-250554msec

Disk stats (read/write):
  sda: ios=1066637/1770, merge=14188/49211, ticks=15125128/31139, in_queue=15153926, util=99.97%
You have new mail in /var/spool/mail/pranay
```

Assignment 2- Setup NFS server in one linux system and access the shared directory from another linux system which will act as NFS client

Refer Network file system slide for this Assignment

A: SERRVER SIDE packages installation

```
[pranay@localhost ~]$ sudo yum install nfs-utils libnfsidmap -y
[sudo] password for pranay:
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: centos.excellmedia.net
 * extras: centos.excellmedia.net
 * updates: centos.excellmedia.net
base                                                                      | 3.6 kB  00:00:00
extras                                                                    | 2.9 kB  00:00:00
mysql-connectors-community                                                | 2.6 kB  00:00:00
mysql-tools-community                                                     | 2.6 kB  00:00:00
mysql57-community                                                         | 2.6 kB  00:00:00
nginx                                                                     | 2.9 kB  00:00:00
updates                                                                   | 2.9 kB  00:00:00
updates/7/x86_64/primary_db                                               |  22 MB  00:00:04
Package libnfsidmap-0.25-19.el7.x86_64 already installed and latest version
Resolving Dependencies
--> Running transaction check
---> Package nfs-utils.x86_64 1:1.3.0-0.66.el7 will be updated
---> Package nfs-utils.x86_64 1:1.3.0-0.68.el7.2 will be an update
--> Finished Dependency Resolution
```

Services status

```
[pranay@localhost ~]$ sudo systemctl status rpcbind.service nfs-server.service rpc-statd.service nfs-idmapd.service
● rpcbind.service - RPC bind service
   Loaded: loaded (/usr/lib/systemd/system/rpcbind.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-08-30 10:56:11 IST; 3h 46min ago
 Main PID: 365 (rpcbind)
   CGroup: /system.slice/rpcbind.service
           └─365 /sbin/rpcbind -w

Aug 30 10:56:10 localhost.localdomain systemd[1]: Starting RPC bind service...
Aug 30 10:56:11 localhost.localdomain systemd[1]: Started RPC bind service.

● nfs-server.service - NFS server and services
   Loaded: loaded (/usr/lib/systemd/system/nfs-server.service; enabled; vendor preset: disabled)
   Active: active (exited) since Wed 2023-08-30 14:42:41 IST; 27s ago
  Process: 3424 ExecStartPost=/bin/sh -c if systemctl -q is-active gssproxy; then systemctl reload gssproxy ; fi (code=e
xited, status=0/SUCCESS)
  Process: 3408 ExecStart=/usr/sbin/rpc.nfsd $RPCNFSDARGS (code=exited, status=0/SUCCESS)
  Process: 3407 ExecStartPre=/usr/sbin/exportfs -r (code=exited, status=0/SUCCESS)
 Main PID: 3408 (code=exited, status=0/SUCCESS)
   CGroup: /system.slice/nfs-server.service

Aug 30 14:42:41 localhost.localdomain systemd[1]: Starting NFS server and services...
Aug 30 14:42:41 localhost.localdomain systemd[1]: Started NFS server and services.

● rpc-statd.service - NFS status monitor for NFSv2/3 locking.
   Loaded: loaded (/usr/lib/systemd/system/rpc-statd.service; static; vendor preset: disabled)
   Active: active (running) since Wed 2023-08-30 14:42:41 IST; 28s ago
  Process: 3397 ExecStart=/usr/sbin/rpc.statd $STATDARGS (code=exited, status=0/SUCCESS)
```

Directories and packages

```
[pranay@localhost /]$ sudo mkdir server
[sudo] password for pranay:
Sorry, try again.
[sudo] password for pranay:
[pranay@localhost /]$ cd server
[pranay@localhost server]$ sudo mkdir apps
[pranay@localhost server]$ ls
apps
[pranay@localhost server]$ chmod 777 server
chmod: cannot access ‘server’: No such file or directory
[pranay@localhost server]$ cd ..
You have new mail in /var/spool/mail/pranay
[pranay@localhost /]$ chmod 777 server
chmod: changing permissions of ‘server’: Operation not permitted
[pranay@localhost /]$ sudo chmod 777 /server
[pranay@localhost /]$ sudo chmod 777 /apps
chmod: cannot access ‘/apps’: No such file or directory
[pranay@localhost /]$ sudo chmod 777 /server/apps
```

Nfs exports

```
[pranay@localhost server]$ cat /etc/exports
/server/apps 192.168.56.103(rw,sync,no_root_squash)
[pranay@localhost server]$ exports -rv
-bash: exports: command not found
[pranay@localhost server]$ exportfs -rv
exporting 192.168.56.103:/server/apps
exportfs: could not open /var/lib/nfs/.etab.lock for locking: errno 13 (Permission denied)
exportfs: can't lock /var/lib/nfs/etab for writing
[pranay@localhost server]$ sudo exportfs -rv
[sudo] password for pranay:
exporting 192.168.56.103:/server/apps
```

CLIENT SIDE

Packages installation

```
[pranay@localhost ~]$ sudo yum install nfs-utils rpcbind  -y
[sudo] password for pranay:
Loaded plugins: fastestmirror
Determining fastest mirrors
 * base: mirrors.nhanhoa.com
 * extras: mirror.xtom.com.hk
 * updates: mirror.xtom.com.hk
base                                                                      | 3.6 kB  00:00:00
extras                                                                    | 2.9 kB  00:00:00
mysql-connectors-community                                                | 2.6 kB  00:00:00
mysql-tools-community                                                     | 2.6 kB  00:00:00
mysql57-community                                                         | 2.6 kB  00:00:00
nginx                                                                     | 2.9 kB  00:00:00
updates                                                                   | 2.9 kB  00:00:00
(1/6): mysql57-community/x86_64/primary_db                                | 349 kB  00:00:00
(2/6): extras/7/x86_64/primary_db                                         | 250 kB  00:00:00
(3/6): mysql-connectors-community/x86_64/primary_db                       | 100 kB  00:00:00
(4/6): mysql-tools-community/x86_64/primary_db                            |  94 kB  00:00:00
(5/6): nginx/x86_64/primary_db                                            |  85 kB  00:00:02
```

Client rpc services

```
[pranay@localhost ~]$ sudo systemctl enable rpcbind
[pranay@localhost ~]$ sudo systemctl start rpcbind
[pranay@localhost ~]$ sudo systemctl status rpcbind
● rpcbind.service - RPC bind service
   Loaded: loaded (/usr/lib/systemd/system/rpcbind.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-08-30 09:45:46 UTC; 3min 32s ago
 Main PID: 399 (rpcbind)
   CGroup: /system.slice/rpcbind.service
           └─399 /sbin/rpcbind -w

Aug 30 09:45:46 localhost.localdomain systemd[1]: Starting RPC bind service...
Aug 30 09:45:46 localhost.localdomain systemd[1]: Started RPC bind service.
```

Mounting client

```
[pranay@localhost ~]$ sudo systemctl stop firewalld.service
[pranay@localhost ~]$ showmount -e 192.168.56.101
Export list for 192.168.56.101:
/server/apps 192.168.56.103
```

```
[pranay@localhost ~]$ sudo mkdir -p /mnt/apps
[pranay@localhost ~]$ cd mnt
-bash: cd: mnt: No such file or directory
[pranay@localhost ~]$ cd /mnt
[pranay@localhost mnt]$ ls
apps
[pranay@localhost mnt]$ cd ..
[pranay@localhost /]$ mount 192.168.56.101:/server/apps /mnt/apps
mount: only root can do that
[pranay@localhost /]$ sudo mount 192.168.56.101:/server/apps /mnt/apps
```

Output

serverside

```
[pranay@localhost server]$ cd apps
[pranay@localhost apps]$ ls
file
[pranay@localhost apps]$ cat file
i have done nfs assigment and the output now u r seeing is from the server side
but this is created on the client side
```

Client side

```
[pranay@localhost /]$ cd mnt
[pranay@localhost mnt]$ cd apps
[pranay@localhost apps]$ ls
[pranay@localhost apps]$ touch file
[pranay@localhost apps]$ ls
file
[pranay@localhost apps]$ vi file
```

Assignment 3 - Add new Virtual hard disk Drive for the virtual box and partition the drive in linux then create file system and mount the file system

Note:

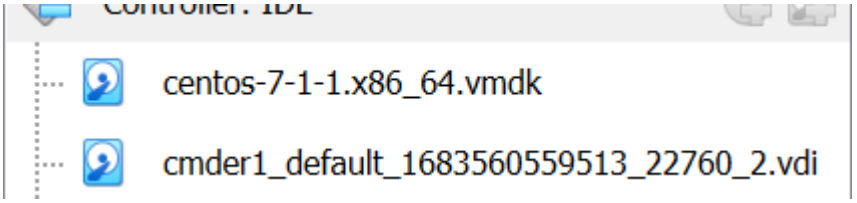
Take a clone of your machine before starting this assignment

Instructions

1. select the Virtual Box, Click on Settings -> Storage, select hard drive and click on Add a hard disk.

2. Create a new disk following the on-screen instructions. Provide the directory on windows where you want the drive created.

A:



Partition the new drive

1. Run "lsblk" command to check the partitions

A:

```
[pranay@localhost ~]$ lsblk
NAME   MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
sda      8:0    0  40G  0 disk
└─sda1   8:1    0  40G  0 part /
sdb      8:16   0  40G  0 disk
```

2. create a new partition using the command "fdisk /dev/sdb"

A:

```
[pranay@localhost ~]$ sudo fdisk -l

Disk /dev/sda: 42.9 GB, 42949672960 bytes, 83886080 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 label type: dos
Disk identifier: 0x0009ef1a

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *        2048    83886079    41942016   83  Linux

Disk /dev/sdb: 42.9 GB, 42949672960 bytes, 83886080 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
```

3. p option will show the list of partitions

4. n option will create new partition

A:

```
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 (2048-83886079, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-83886079, default 83886079):
Using default value 83886079
Partition 1 of type Linux and of size 40 GiB is set

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
```

5. Create 1 primary partition

6. specify where the partition will begin and end by accepting the default values

7. w option will save the changes

(Note: Since this is the first partition we can start at the first available sector and since we want to use the entire disk we can specify the last sector as the end. Note that, if you wish to create multiple partitions - you can even specify the size of each partition
by sectors, bytes, kilobytes or megabytes)
8. Create the file system on the partition using the command "/usr/sbin/mkfs.ext4 -L data /dev/sdb1"
A:

```
[pranay@localhost ~]$ sudo /usr/sbin/mkfs.ext4 -L data /dev/sdb1
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=data
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
2621440 inodes, 10485504 blocks
524275 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2157969408
320 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, 2654208,
        4096000, 7962624

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

9. Create the directory /data
10. Mount the file system using the command "mount LABEL=data /data"
A:

```
[pranay@localhost ~]$ sudo mkdir /data
[pranay@localhost ~]$ sudo mount LABEL=data /data
```

Run the mount command with no arguments which shows all currently mounted filesystems. You can use the below command as well
lsblk -o NAME,FSTYPE,SIZE,MOUNTPOINT,LABEL

```
[pranay@localhost ~]$ lsblk -o NAME,FSTYPE,SIZE,MOUNTPOINT,LABEL
NAME   FSTYPE SIZE MOUNTPOINT LABEL
sda            40G
└─sda1 xfs     40G /
sdb            40G
└─sdb1 ext4    40G /data      data
```

11. To automatically mount the file system at the time of boot we need the below entry to be added to the /etc/fstab file
LABEL=data /data ext4 defaults 12
A:

```
[pranay@localhost ~]$ sudo cat /etc/fstab

#
# /etc/fstab
# Created by anaconda on Thu Apr 30 22:04:55 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
#
UUID=1c419d6c-5064-4a2b-953c-05b2c67edb15 /                       xfs     defaults        0 0
/swapfile none swap defaults 0 0
LABEL=data /data ext4 defaults 12
```

Assignment 4 - Expanding a filesystem on the fly using Logical Volume Management

Instructions

Note: install LVM using sudo yum install lvm2

Adding a new logical volume

1.1 Install a new hard drive.

A:

```
[pranay@localhost ~]$ sudo yum install lvm2
[sudo] password for pranay:
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: centos.excellmedia.net
 * extras: centos.excellmedia.net
 * updates: centos.excellmedia.net
base                                                                      | 3.6 kB  00:00:00
extras                                                                    | 2.9 kB  00:00:00
mysql-connectors-community                                                | 2.6 kB  00:00:00
mysql-tools-community                                                     | 2.6 kB  00:00:00
mysql57-community                                                         | 2.6 kB  00:00:00
nginx                                                                     | 2.9 kB  00:00:00
updates                                                                   | 2.9 kB  00:00:00
Resolving Dependencies
--> Running transaction check
---> Package lvm2.x86_64 7:2.02.187-6.el7_9.5 will be installed
--> Processing Dependency: lvm2-libs = 7:2.02.187-6.el7_9.5 for package: 7:lvm2-2.02.187-6.el7_9.5.x86_64
--> Processing Dependency: device-mapper-persistent-data >= 0.7.0-0.1.rc6 for package: 7:lvm2-2.02.187-6.el7_9.5.x86_64
--> Processing Dependency: liblvm2app.so.2.2(Base)(64bit) for package: 7:lvm2-2.02.187-6.el7_9.5.x86_64
--> Processing Dependency: libdevmapper-event.so.1.02(Base)(64bit) for package: 7:lvm2-2.02.187-6.el7_9.5.x86_64
--> Processing Dependency: liblvm2app.so.2.2()(64bit) for package: 7:lvm2-2.02.187-6.el7_9.5.x86_64
--> Processing Dependency: libdevmapper-event.so.1.02()(64bit) for package: 7:lvm2-2.02.187-6.el7_9.5.x86_64
--> Running transaction check
---> Package device-mapper-event-libs.x86_64 7:1.02.170-6.el7_9.5 will be installed
---> Package device-mapper-persistent-data.x86_64 0:0.8.5-3.el7_9.2 will be installed
---> Package lvm2-libs.x86_64 7:2.02.187-6.el7_9.5 will be installed
--> Processing Dependency: device-mapper-event = 7:1.02.170-6.el7_9.5 for package: 7:lvm2-libs-2.02.187-6.el7_9.5.x86_64--> Running
transaction check
```

1.2 Use lsblk command to identify the new hard drive.

1.3 Create Physical Volume from the hard drive using "pvcreate /dev/sdc". Assuming /dev/sdc is the new hard drive created.

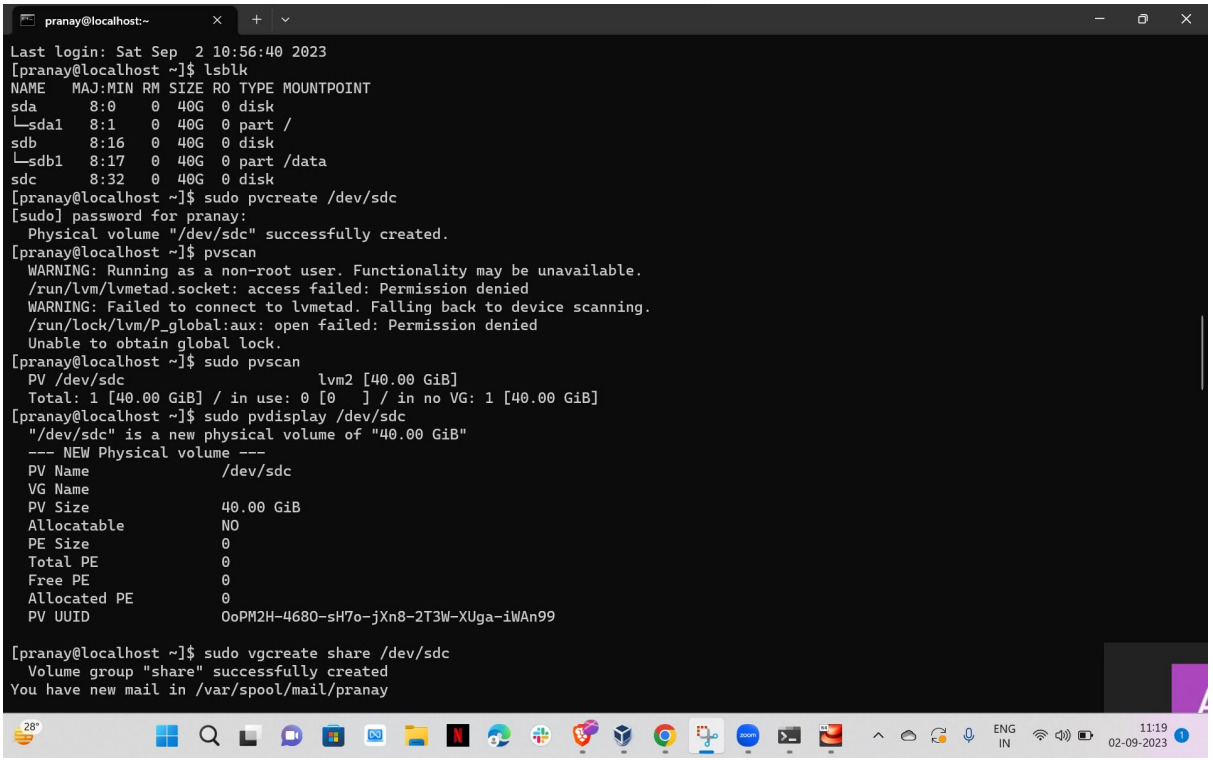
1.4 You can list all the PV with the command:pvscan

1.5 If you want to display more information about any specific PV, let's say /dev/sdc run

"pvdisplay/dev/sdc"

1.6 Create Volume Group named "share" using sudo vgcreate share /dev/sdc

A: 1.2 to 1.6



1.7 you can list all the VGs with the command:vgscan
1.8 You can display more information about any specific VG, such as share with the command:vgdisplay share
1.9 Create Logical Volume: To create a 100MB LV mylv from VG share use the command
"sudo lvcreate --size 100M --name mylv share"
1.10 create another LV mylv1 of size 1GB from VG share with the command:"sudo lvcreate
--size 1G --name mylv1 share"
1.11 list all the LVs with the commands: lvscan or lvs

A: 1.7 to 1.11

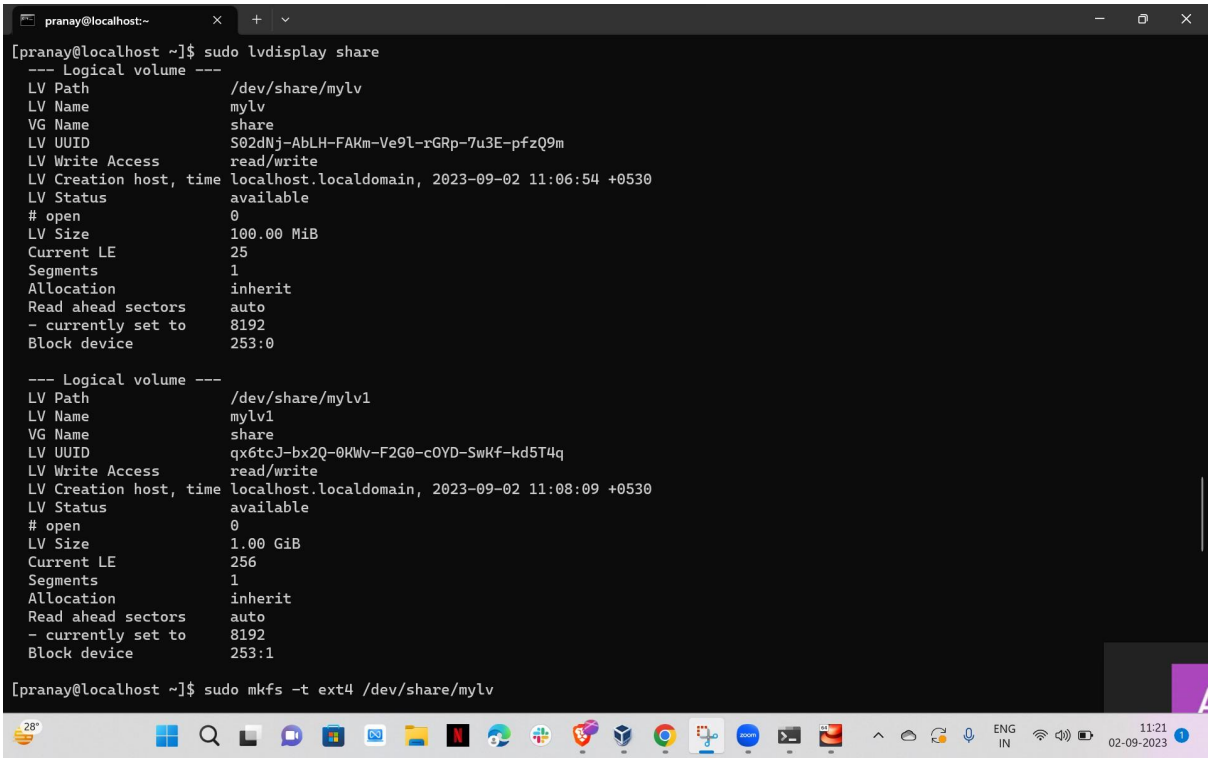
```
[pranay@localhost ~]$ sudo vgscan
  Reading volume groups from cache.
  Found volume group "share" using metadata type lvm2
[pranay@localhost ~]$ sudo vgdisplay share
  --- Volume group ---
  VG Name               share
  System ID
  Format                lvm2
  Metadata Areas        1
  Metadata 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               <40.00 GiB
  PE Size               4.00 MiB
  Total PE              10239
  Alloc PE / Size       0 / 0
  Free  PE / Size       10239 / <40.00 GiB
  VG UUID               QTOd6y-17EA-89ZO-E2Ns-jemF-nPpc-bGfYBZ

[pranay@localhost ~]$ sudo lvcreate --size 100M --name mylv share
  Logical volume "mylv" created.
[pranay@localhost ~]$ sudo lvcreate --size 1G --name mylv1 share
  Logical volume "mylv1" created.
[pranay@localhost ~]$ sudo lvs
  LV    VG    Attr       LSize   Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
  mylv  share -wi-a----- 100.00m
  mylv1 share -wi-a-----   1.00g
[pranay@localhost ~]$ sudo lvdisplay mylv
```

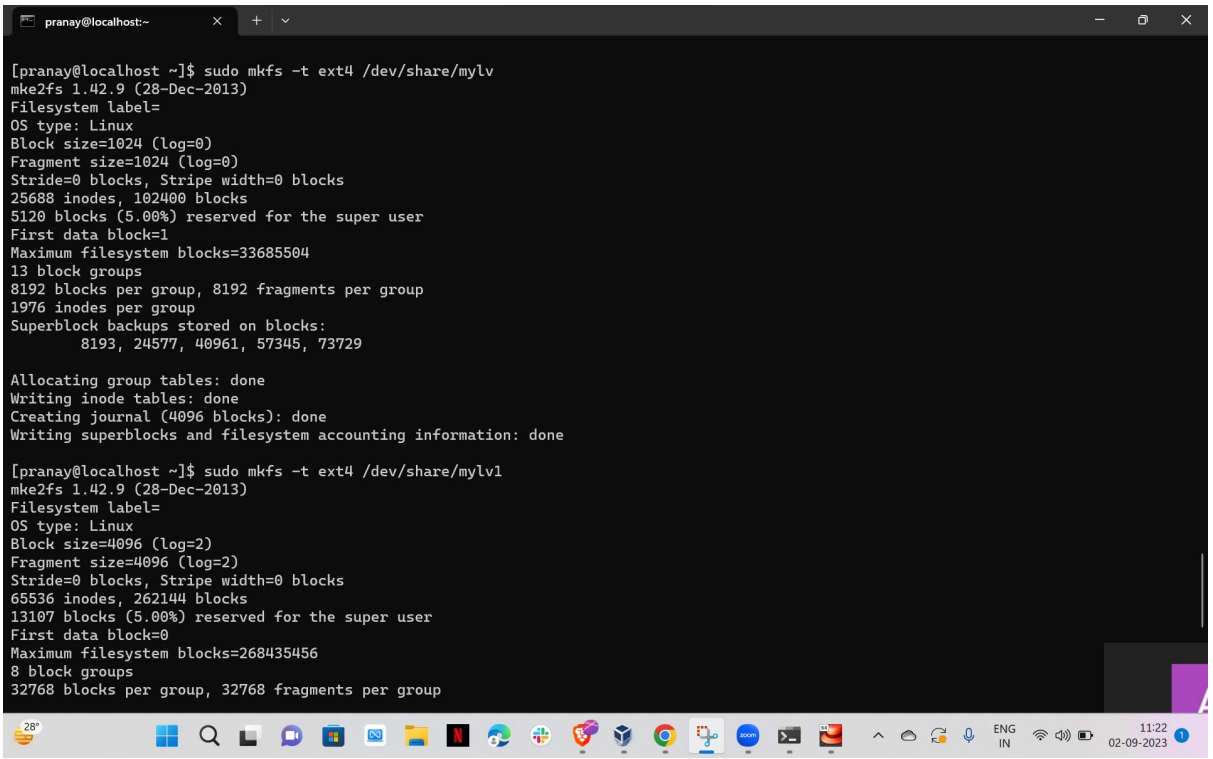
1.12 You can also display more information about any specific LV with the command:"sudo lvdisplay VG_NAME/LV_NAME"

1.13 The LVs are available as /dev/VG_NAME/LV_NAME. You should be able to see teh 2 LVs created so far.

A: 1.12 to 1.13



1.14 Format the Logical Volumes
mkfs -t ext4 /dev/share/mylv
mkfs -t ext4 /dev/share/mylv1
A:



1.15 create mount points where you want to mount these LVs
1.16 add an appropriate entry to the /etc/fstab file, and mount the filesystem.
sudo mkdir -pv/lvmdata

sudo mkdir -pv/lvmdata1
entries in /etc/fstab file
/dev/share/mylv/lvmdata ext4 defaults 1 2
/dev/share/mylv1 /lvmdata1 ext4 defaults 1 2
run the command "mount -a" to load the mount points
1.17 to verify the volume has been created correctly, You can use the commands df, lvs,
and vgs
1.18 Extend Logical Volume. for ex: For example, to add 500MB more to our LV mylv created from VG share, run the following command:
lvextend --size +500M --resizefs share/mylv
A: 1.15 to 1.18

```
[pranay@localhost ~]$ sudo mkdir -pv /lvmdata
mkdir: created directory ‘/lvmdata’
[pranay@localhost ~]$ sudo mkdir -pv /lvmdata1
mkdir: created directory ‘/lvmdata1’
[pranay@localhost ~]$ sudo vi /etc/fstab
[pranay@localhost ~]$ mount -a
mount: only root can use "--all" option
[pranay@localhost ~]$ sudo mount -a
[pranay@localhost ~]$ sudo lvs
  LV    VG    Attr       LSize   Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
  mylv  share -wi-ao---- 100.00m
  mylv1 share -wi-ao----   1.00g
[pranay@localhost ~]$ sudo lvextend --size +500M --resizefs share/mylv
  Size of logical volume share/mylv changed from 100.00 MiB (25 extents) to 600.00 MiB (150 extents).
  Logical volume share/mylv successfully resized.
resize2fs 1.42.9 (28-Dec-2013)
Filesystem at /dev/mapper/share-mylv is mounted on /lvmdata; on-line resizing required
old_desc_blocks = 1, new_desc_blocks = 5
The filesystem on /dev/mapper/share-mylv is now 614400 blocks long.
```