Assignment 4 – Disk Partitioning, File System Creation, Management and Mounting

Create partition on newly attached disk as per below instructions -

a) Create 2 primary partitions of 3 GB each

Run the command sudo fdisk /dev/xvdb

Press n for creating a partion

Then choose p for primary partition

Give last sector size as +3G

```
Command (m for help): n
Partition type
   p   primary (0 primary, 1 extended, 3 free)
   l   logical (numbered from 5)
Select (default p): p
Partition number (2-4, default 2):
First sector (25167872-41943039, default 25167872):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (25167872-41943039, default 41943039): +3G

Created a new partition 2 of type 'Linux' and of size 3 GiB.

Command (m for help): n
Partition type
   p   primary (1 primary, 1 extended, 2 free)
   l   logical (numbered from 5)
Select (default p): p
Partition number (3,4, default 3):
First sector (31459328-41943039, default 31459328):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (31459328-41943039, default 41943039): +3G

Created a new partition 3 of type 'Linux' and of size 3 GiB.

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

ubuntu@ip-172-31-7-146:~$ lsblk -p
NAME          MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
/dev/loop0      7:0    0 25.2M  1 loop /snap/amazon-ssm-agent/7993
/dev/loop1      7:1    0 55.7M  1 loop /snap/core18/2829
/dev/loop2      7:2    0 38.8M  1 loop /snap/snapd/21759
/dev/loop3      7:3    0 55.4M  1 loop /snap/core18/2846
/dev/xvda     202:0    0    8G  0 disk
├─/dev/xvda1  202:1    0    7G  0 part /
├─/dev/xvda14 202:14   0    4M  0 part
├─/dev/xvda15 202:15   0  106M  0 part /boot/efi
└─/dev/xvda16 259:0    0  913M  0 part /boot
/dev/xvdb     202:16   0   20G  0 disk
├─/dev/xvdb1  202:17   0    1K  0 part
├─/dev/xvdb2  202:18   0    3G  0 part
├─/dev/xvdb3  202:19   0    3G  0 part
├─/dev/xvdb5  202:21   0    6G  0 part
└─/dev/xvdb6  202:22   0    6G  0 part
ubuntu@ip-172-31-7-146:~$
```

b) Create 2 logical partitions of 6 GB each

sudo fdisk /dev/xvdb

Inside fdisk
Type
n (creating a partition)
Select e as we are creating logical partition for that we need extended partition
Then put the last sector size as +12G as we need to create 2 logical partitions with 6g each

```
ubuntu@ip-172-31-7-146:~$ sudo  fdisk /dev/xvdb

Welcome to fdisk (util-linux 2.39.3).
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)
Select (default p): e
Partition number (1-4, default 1):
First sector (2048-41943039, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-41943039, default 41943039): +12G

Created a new partition 1 of type 'Extended' and of size 12 GiB.

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

Then create the logical partitions by selecting n again
This time choose l for logical partition

```
Command (m for help): n
Partition type
   p   primary (0 primary, 1 extended, 3 free)
   l   logical (numbered from 5)
Select (default p): l

Adding logical partition 5
First sector (4096-25167871, default 4096):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (4096-25167871, default 25167871): +6G

Created a new partition 5 of type 'Linux' and of size 6 GiB.

Command (m for help): n
Partition type
   p   primary (0 primary, 1 extended, 3 free)
   l   logical (numbered from 5)
Select (default p): l

Adding logical partition 6
First sector (12589056-25167871, default 12589056):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (12589056-25167871, default 25167871): +6G
Value out of range.
Last sector, +/-sectors or +/-size{K,M,G,T,P} (12589056-25167871, default 25167871):

Created a new partition 6 of type 'Linux' and of size 6 GiB.

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

ubuntu@ip-172-31-7-146:~$ lsblk -p
NAME          MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
/dev/loop0      7:0    0 25.2M  1 loop /snap/amazon-ssm-agent/7993
/dev/loop1      7:1    0 55.7M  1 loop /snap/core18/2829
/dev/loop2      7:2    0 38.8M  1 loop /snap/snapd/21759
/dev/loop3      7:3    0 55.4M  1 loop /snap/core18/2846
/dev/xvda     202:0    0    8G  0 disk
├─/dev/xvda1  202:1    0    7G  0 part /
├─/dev/xvda14 202:14   0    4M  0 part
├─/dev/xvda15 202:15   0  106M  0 part /boot/efi
└─/dev/xvda16 259:0    0  913M  0 part /boot
/dev/xvdb     202:16   0   20G  0 disk
├─/dev/xvdb1  202:17   0    1K  0 part
├─/dev/xvdb5  202:21   0    6G  0 part
└─/dev/xvdb6  202:22   0    6G  0 part
ubuntu@ip-172-31-7-146:~$
```

c) Format all 4 partitions and create ext4 filesystem on that
sudo mkfs.ext4 /dev/xvdb2
sudo mkfs.ext4 /dev/xvdb3
sudo mkfs.ext4 /dev/xvdb5
sudo mkfs.ext4 /dev/xvdb6

```
ubuntu@ip-172-31-7-146:~$ lsblk -p | grep /dev/xvdb
/dev/xvdb      202:16   0   20G  0 disk
├─/dev/xvdb1   202:17   0    1K  0 part
├─/dev/xvdb2   202:18   0    3G  0 part
├─/dev/xvdb3   202:19   0    3G  0 part
├─/dev/xvdb5   202:21   0    6G  0 part
└─/dev/xvdb6   202:22   0    6G  0 part
ubuntu@ip-172-31-7-146:~$ sudo mkfs.ext4 /dev/xvdb2
mke2fs 1.47.0 (5-Feb-2023)
Creating filesystem with 786432 4k blocks and 196608 inodes
Filesystem UUID: 56ed6ee6-7b16-49a3-b857-ceee354b5223
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912

Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done
```

d) Create 4 folders inside root (/) folder name it as Data1, Data2, Data3, Data4
sudo mkdir /Data1 /Data2 /Data3 /Data4

e) Mount all formated partitions on the respective folders
sudo mount /dev/xvdb2 /Data1
sudo mount /dev/xvdb3 /Data2
sudo mount /dev/xvdb5 /Data3
sudo mount /dev/xvdb6 /Data4

```
ubuntu@ip-172-31-7-146:~$ sudo mkdir /Data1 /Data2 /Data3 /Data4
ubuntu@ip-172-31-7-146:~$ sudo mount /dev/xvdb2 /Data1
ubuntu@ip-172-31-7-146:~$ sudo mount /dev/xvdb3 /Data2
ubuntu@ip-172-31-7-146:~$ sudo mount /dev/xvdb5 /Data3
ubuntu@ip-172-31-7-146:~$ sudo mount /dev/xvdb6 /Data4
ubuntu@ip-172-31-7-146:~$
```

f) Create empty file inside each folders of size 2 GB, 2GB, 4 GB and 4 GB

sudo dd if=/dev/zero of=/Data1/file1 bs=128M count=16
-If input file with zeroes using /dev/zeroes

-of output file which will be filled with zeroes

-bs block size

- count of blocks

```
ubuntu@ip-172-31-7-146:~$ sudo dd if=/dev/zero of=/Data1/file1 bs=128M count=16

q16+0 records in
16+0 records out
2147483648 bytes (2.1 GB, 2.0 GiB) copied, 31.0849 s, 69.1 MB/s
ubuntu@ip-172-31-7-146:~$
ubuntu@ip-172-31-7-146:~$ lsblk -p | grep /dev/xvdb
/dev/xvdb      202:16   0   20G  0 disk
├─/dev/xvdb1   202:17   0    1K  0 part
├─/dev/xvdb2   202:18   0    3G  0 part /Data1
├─/dev/xvdb3   202:19   0    3G  0 part /Data2
├─/dev/xvdb5   202:21   0    6G  0 part /Data3
└─/dev/xvdb6   202:22   0    6G  0 part /Data4
ubuntu@ip-172-31-7-146:~$ sudo dd if=/dev/zero of=/Data2/file1 bs=128M count=16
16+0 records in
16+0 records out
2147483648 bytes (2.1 GB, 2.0 GiB) copied, 31.1275 s, 69.0 MB/s
ubuntu@ip-172-31-7-146:~$ sudo dd if=/dev/zero of=/Data3/file1 bs=128M count=16
16+0 records in
16+0 records out
2147483648 bytes (2.1 GB, 2.0 GiB) copied, 31.1155 s, 69.0 MB/s
ubuntu@ip-172-31-7-146:~$ sudo dd if=/dev/zero of=/Data4/file1 bs=128M count=16
16+0 records in
16+0 records out
2147483648 bytes (2.1 GB, 2.0 GiB) copied, 31.1599 s, 68.9 MB/s
ubuntu@ip-172-31-7-146:~$
```

g) Go inside /Data1 and run command - while(true); do sleep 5s; done , do ctrl-z
h) Check disk utilization of each mount point

```
ubuntu@ip-172-31-7-146:/Data1$ while(true); do sleep 5s;
> ^C
ubuntu@ip-172-31-7-146:/Data1$ cd
ubuntu@ip-172-31-7-146:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root       6.8G  1.7G  5.1G  25% /
tmpfs           479M     0  479M   0% /dev/shm
tmpfs           192M  892K  191M   1% /run
tmpfs           5.0M     0  5.0M   0% /run/lock
/dev/xvda16     881M   76M  744M  10% /boot
/dev/xvda15     105M  6.1M   99M   6% /boot/efi
tmpfs            96M   12K   96M   1% /run/user/1000
/dev/xvdb2      2.9G  2.1G  734M  74% /Data1
/dev/xvdb3      2.9G  2.1G  734M  74% /Data2
/dev/xvdb5      5.9G  2.1G  3.6G  37% /Data3
/dev/xvdb6      5.9G  2.1G  3.6G  37% /Data4
ubuntu@ip-172-31-7-146:~$
```

i) Unmount all partitions /Data1, /Data2, /Data3 and /Data4
sudo unmount /Data1 /Data2 /Data3 /Data4