

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

**Launch virtual machine in the cloud, attach 20 GB EBS volume**

**Important Note:-** Do not try partition, filesystem creation on your local desktop or laptop instead use virtual machine to do practice. These operations are destructive, chances of system crash. Work carefully.

**Create partition on newly attached disk as per below instructions -**

- a) Create 2 primary partitions of 3 GB each

Cmd – `sudo fdisk /dev/xvdb`

Inside fdisk

n

Partition type – p

```
ubuntu@ip-172-31-2-173:~$ 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.

Device does not contain a recognized partition table.
Created a new DOS (MBR) disklabel with disk identifier 0x6b9c18d5.

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 (2048-41943039, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-41943039, default 41943039): +3G

Created a new partition 1 of type 'Linux' and of size 3 GiB.
```

- b) Create 2 logical partitions of 6 GB each

First do Extended Partition and then do logical partition

Inside fdisk

n

Partition Type – l

```
Command (m for help): n
Partition type
  p   primary (2 primary, 1 extended, 1 free)
  l   logical (numbered from 5)
Select (default p): l

Adding logical partition 5
First sector (12587008-37750783, default 12587008):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (12587008-37750783, default 37750783): +6G

Created a new partition 5 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.
```

c) Format all 4 partitions and create ext4 filesystem on that

```
Cmd - sudo mkfs.ext4 /dev/xvdb1
      sudo mkfs.ext4 /dev/xvdb2
      sudo mkfs.ext4 /dev/xvdb5
      sudo mkfs.ext4 /dev/xvdb6
```

```
ubuntu@ip-172-31-2-173:~$ sudo mkfs.ext4 /dev/xvdb1
mke2fs 1.47.0 (5-Feb-2023)
Creating filesystem with 786432 4k blocks and 196608 inodes
Filesystem UUID: 159608f4-c6a7-408f-9767-87d88ebc40e5
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

```
Cmd - sudo mkdir /Data1 /Data2 /Data3 /Data4
```

```
ubuntu@ip-172-31-2-173:~$ sudo mkdir /Data1 /Data2 /Data3 /Data4
ubuntu@ip-172-31-2-173:~$
```

e) Mount all formatted partitions on the respective folders

```
Cmd - sudo mount /dev/xvdb1 /Data1
      sudo mount /dev/xvdb2 /Data2
      sudo mount /dev/xvdb5 /Data3
      sudo mount /dev/xvdb6 /Data4
```

```
ubuntu@ip-172-31-2-173:~$ sudo mkdir /Data1 /Data2 /Data3 /Data4
ubuntu@ip-172-31-2-173:~$ sudo mount /dev/xvdb1 /Data1
ubuntu@ip-172-31-2-173:~$ sudo mount /dev/xvdb2 /Data2
ubuntu@ip-172-31-2-173:~$ sudo mount /dev/xvdb5 /Data3
ubuntu@ip-172-31-2-173:~$ sudo mount /dev/xvdb6 /Data4
ubuntu@ip-172-31-2-173:~$
```

f) Create empty file inside each folders of size 2 GB, 2GB, 4 GB and 4 GB respectively using command - dd - "convert and copy a file"

```
Cmd - sudo dd if=/dev/zero of=/Data1/file1 bs=128M count=16
      sudo dd if=/dev/zero of=/Data2/file2 bs=128M count=16
      sudo dd if=/dev/zero of=/Data3/file3 bs=128M count=32
      sudo dd if=/dev/zero of=/Data4/file4 bs=128M count=32
```

```
ubuntu@ip-172-31-2-173:~$ sudo dd if=/dev/zero of=/Data1/file1 bs=128M count=16
16+0 records in
16+0 records out
2147483648 bytes (2.1 GB, 2.0 GiB) copied, 15.4129 s, 139 MB/s
ubuntu@ip-172-31-2-173:~$ sudo dd if=/dev/zero of=/Data2/file2 bs=128M count=16
16+0 records in
16+0 records out
2147483648 bytes (2.1 GB, 2.0 GiB) copied, 14.7606 s, 145 MB/s
ubuntu@ip-172-31-2-173:~$ sudo dd if=/dev/zero of=/Data3/file3 bs=128M count=32
32+0 records in
32+0 records out
4294967296 bytes (4.3 GB, 4.0 GiB) copied, 31.4608 s, 137 MB/s
ubuntu@ip-172-31-2-173:~$ sudo dd if=/dev/zero of=/Data4/file4 bs=128M count=32
32+0 records in
32+0 records out
4294967296 bytes (4.3 GB, 4.0 GiB) copied, 31.1005 s, 138 MB/s
ubuntu@ip-172-31-2-173:~$
```

g) Go inside /Data1 and run command - while(true); do sleep 5s; done , do ctrl-z

```
ubuntu@ip-172-31-2-173:~$ cd /Data1
ubuntu@ip-172-31-2-173:/Data1$ while true; do sleep 5s; done
^Z
[1]+  Stopped                  sleep 5s
ubuntu@ip-172-31-2-173:/Data1$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        6.8G  2.2G  4.6G  33% /
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  133M  687M  17% /boot
/dev/xvda15      105M   6.1M   99M   6% /boot/efi
tmpfs            96M   12K   96M   1% /run/user/1000
/dev/xvdb1       2.9G  2.1G  734M  74% /Data1
/dev/xvdb2       2.9G  2.1G  734M  74% /Data2
/dev/xvdb5       5.9G  4.1G  1.6G  73% /Data3
/dev/xvdb6       5.9G  4.1G  1.6G  73% /Data4
ubuntu@ip-172-31-2-173:/Data1$
```

h) Check disk utilization of each mount point

Cmd - df -h

```
ubuntu@ip-172-31-2-173:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        6.8G  2.2G  4.6G  33% /
tmpfs            479M   0  479M   0% /dev/shm
tmpfs            192M  920K  191M   1% /run
tmpfs            5.0M   0   5.0M   0% /run/lock
/dev/xvdb1       2.9G  2.1G  734M  74% /Data1
/dev/xvdb2       2.9G  2.1G  734M  74% /Data2
/dev/xvdb5       5.9G  4.1G  1.6G  73% /Data3
/dev/xvdb6       5.9G  4.1G  1.6G  73% /Data4
/dev/xvda16      881M  133M  687M  17% /boot
/dev/xvda15      105M   6.1M   99M   6% /boot/efi
tmpfs            96M   12K   96M   1% /run/user/1000
```

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

Cmd - sudo umount /Data1 /Data2 /Data3 /Data4

```
ubuntu@ip-172-31-2-173:~$ sudo umount /Data1 /Data2 /Data3 /Data4
umount: /Data2: not mounted.
umount: /Data3: not mounted.
umount: /Data4: not mounted.
ubuntu@ip-172-31-2-173:~$ sudo nano /etc/fstab
ubuntu@ip-172-31-2-173:~$ sudo mount -a
mount: (hint) your fstab has been modified, but systemd still uses
the old version; use 'systemctl daemon-reload' to reload.
ubuntu@ip-172-31-2-173:~$
```

**Note:-** All partitions should be automatically mounted post reboot.