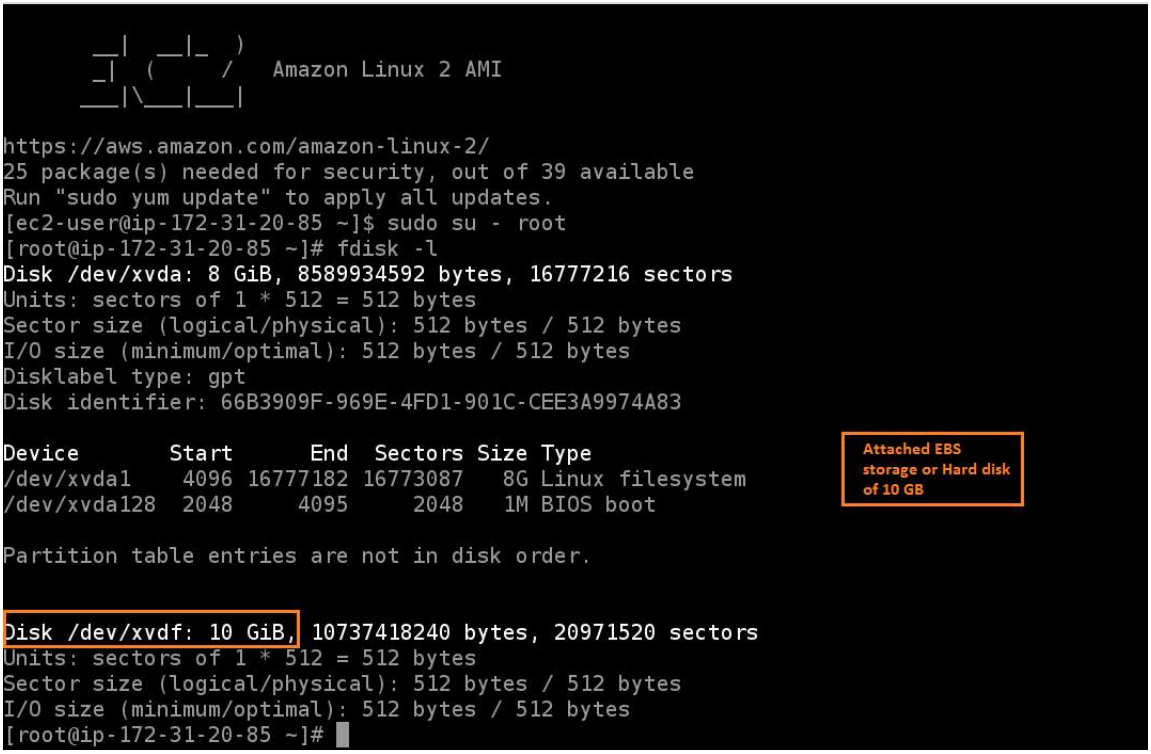
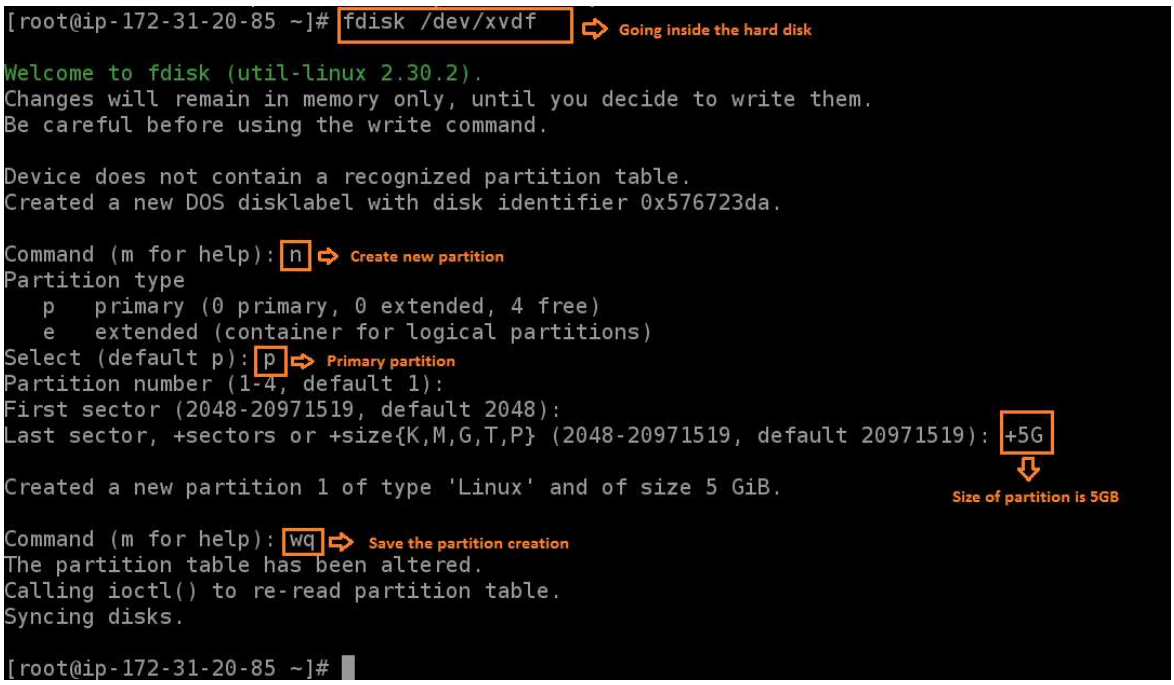
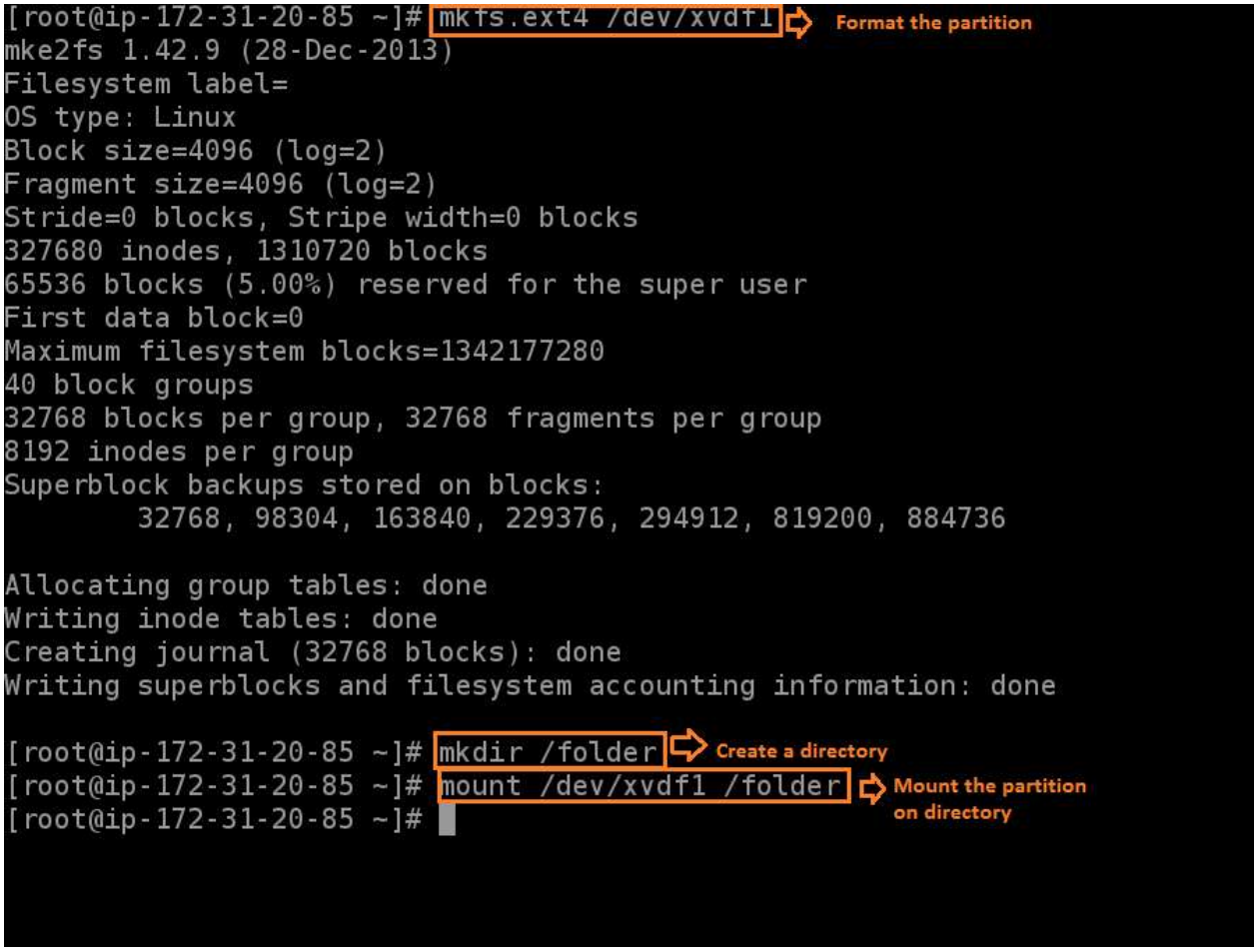
Task 7.1

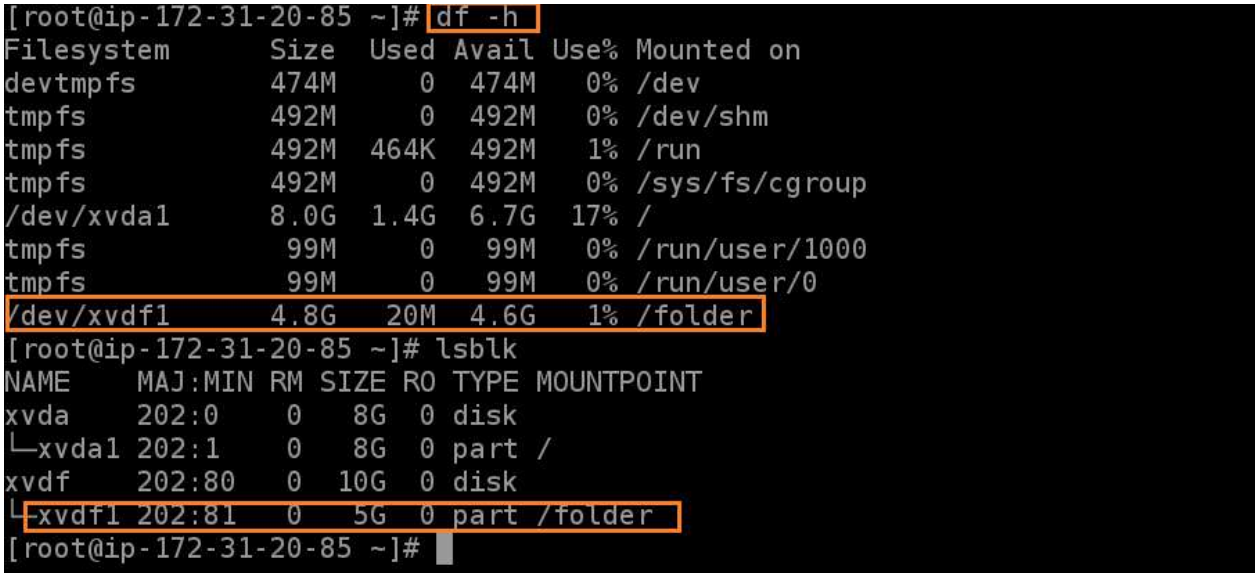
7.1: Elasticity Task

Increase or Decrease the Size of Static Partition in Linux.






[root@ip-172-31-20-85 ~]# mkfs.ext4 /dev/xvdf1
Format the partition
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
327680 inodes, 1310720 blocks
65536 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=1342177280
40 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
Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
[root@ip-172-31-20-85 ~]# mkdir /folder
Create a directory
[root@ip-172-31-20-85 ~]# mount /dev/xvdf1 /folder
Mount the partition on directory
[root@ip-172-31-20-85 ~]#


[root@ip-172-31-20-85 ~]# df -h
Filesystem Size Used Avail Use% Mounted on
devtmpfs 474M 0 474M 0% /dev
tmpfs 492M 0 492M 0% /dev/shm
tmpfs 492M 464K 492M 1% /run
tmpfs 492M 0 492M 0% /sys/fs/cgroup
/dev/xvda1 8.0G 1.4G 6.7G 17% /
tmpfs 99M 0 99M 0% /run/user/1000
tmpfs 99M 0 99M 0% /run/user/0
/dev/xvdf1 4.8G 20M 4.6G 1% /folder
[root@ip-172-31-20-85 ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda 202:0 0 8G 0 disk
└─xvda1 202:1 0 8G 0 part /
xvdf 202:80 0 10G 0 disk
└─xvdf1 202:81 0 5G 0 part /folder
[root@ip-172-31-20-85 ~]#

```
root@ip-172-31-20-85 folder]# ls
ile.txt  lost+found
root@ip-172-31-20-85 folder]# cat file.txt
THis is first file"
root@ip-172-31-20-85 folder]#
```

Created a file in /folder file.txt

```
[root@ip-172-31-20-85 ~]# umount /dev/xvdf1 /folder
umount: /folder: not mounted.
[root@ip-172-31-20-85 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0   8G  0 disk
└─xvda1 202:1    0   8G  0 part /
xvdf    202:80   0  10G  0 disk
└─xvdf1 202:81   0   5G  0 part
[root@ip-172-31-20-85 ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        474M     0  474M   0% /dev
tmpfs           492M     0  492M   0% /dev/shm
tmpfs           492M  464K  492M   1% /run
tmpfs           492M     0  492M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  1.4G  6.7G  17% /
tmpfs            99M     0   99M   0% /run/user/1000
tmpfs            99M     0   99M   0% /run/user/0
```

Umounted the partition to make changes to it.

Steps till now are common for extending and reducing partition size

✨Further steps for Increasing the partition size -

```
[root@ip-172-31-20-85 ~]# fdisk /dev/xvdf

Welcome to fdisk (util-linux 2.30.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.


Command (m for help): d
Selected partition 1
Partition 1 has been deleted.

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

[root@ip-172-31-20-85 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0   8G  0 disk
└─xvda1 202:1    0   8G  0 part /
xvdf    202:80   0  10G  0 disk
```

Deleted the partition (5GB) created earlier with the file, although data is still there on the hard disk.

```
[root@ip-172-31-20-85 ~]# fdisk /dev/xvdf

Welcome to fdisk (util-linux 2.30.2).
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): p
Partition number (1-4, default 1):
First sector (2048-20971519, default 2048):
Last sector, +sectors or +size{K,M,G,T,P} (2048-20971519, default 20971519): +8G

Created a new partition 1 of type 'Linux' and of size 8 GiB.
Partition #1 contains a ext4 signature.

Do you want to remove the signature? [Y]es/[N]o: No

Command (m for help): wq

The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
```

Here creating a new partition with increased size of 8GB

Since we want to retain ext4 signature on our root partition we will use No, else all the metadat in partition related to data stored in previous partition will be lost.

```
[root@ip-172-31-20-85 ~]# resize2fs /dev/xvdf1
resize2fs 1.42.9 (28-Dec-2013)
Please run 'e2fsck -f /dev/xvdf1' first.

[root@ip-172-31-20-85 ~]# ^C
[root@ip-172-31-20-85 ~]# e2fsck -f /dev/xvdf1
e2fsck 1.42.9 (28-Dec-2013)
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/xvdf1: 12/327680 files (0.0% non-contiguous), 58463/1310720 blocks
[root@ip-172-31-20-85 ~]# resize2fs /dev/xvdf1
resize2fs 1.42.9 (28-Dec-2013)
Resizing the filesystem on /dev/xvdf1 to 2097152 (4k) blocks.
The filesystem on /dev/xvdf1 is now 2097152 blocks long.

[root@ip-172-31-20-85 ~]# mount /dev/xvdf1 /folder
[root@ip-172-31-20-85 ~]# cd /folder
[root@ip-172-31-20-85 folder]# ls
file.txt  lost+found
[root@ip-172-31-20-85 folder]# cat file.txt
'THis is first file"
[root@ip-172-31-20-85 folder]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0   8G  0 disk
└─xvda1 202:1    0   8G  0 part /
xvdf    202:80   0  10G  0 disk
└─xvdf1 202:81   0   8G  0 part /folder
[root@ip-172-31-20-85 folder]#
```

Checks the modified file system for errors.

Modifies existing file system to fit new partition size bounds.

New partition still has the old file. Hence no data loss on size extension

We can see the increased size of partition.

Continued steps for Decreasing the partition size -

```
[root@ip-172-31-20-85 ~]# umount /dev/xvdf1 /folder
umount: /folder: not mounted.
[root@ip-172-31-20-85 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0   8G  0 disk
└─xvda1 202:1    0   8G  0 part /
xvdf    202:80   0  10G  0 disk
└─xvdf1 202:81   0   8G  0 part
```

Unmounted the partition to make furter changes in partition size(Reduce size) At present the size of partition is 8GB

```
[root@ip-172-31-20-85 ~]# lsblk
NAME    MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda    202:0    0   8G  0 disk
└─xvda1 202:1    0   8G  0 part /
xvdf    202:80   0  10G  0 disk
└─xvdf1 202:81   0   8G  0 part
[root@ip-172-31-20-85 ~]# e2fsck -f /dev/xvdf1
e2fsck 1.42.9 (28-Dec-2013)
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/xvdf1: 12/393216 files (0.0% non-contiguous), 65647/1572864 blocks
[root@ip-172-31-20-85 ~]# resize2fs /dev/xvdf1 6G
resize2fs 1.42.9 (28-Dec-2013)
The filesystem is already 1572864 blocks long.  Nothing to do!
```

Unlike in extension, here we will first reduce the size of file system to desired reduced size of partition and then delete it.

```
Pass 4: Checking reference counts
Pass 5: Checking group summary information
/dev/xvdf1: 12/393216 files (0.0% non-contiguous), 65647/1572864 blocks
[root@ip-172-31-20-85 ~]# resize2fs /dev/xvdf1 6G
resize2fs 1.42.9 (28-Dec-2013)
The filesystem is already 1572864 blocks long.  Nothing to do!

[root@ip-172-31-20-85 ~]# fdisk /dev/xvdf

Welcome to fdisk (util-linux 2.30.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.


Command (m for help): d
Selected partition 1
Partition 1 has been deleted.

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

Deleted the partition of size 8GB

```
[root@ip-172-31-20-85 ~]# fdisk /dev/xvdf

Welcome to fdisk (util-linux 2.30.2).
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):

Using default response p.
Partition number (1-4, default 1):
First sector (2048-20971519, default 2048):
Last sector, +sectors or +size{K,M,G,T,P} (2048-20971519, default 20971519): +6G

Created a new partition 1 of type 'Linux' and of size 6 GiB.
Partition #1 contains a ext4 signature.

Do you want to remove the signature? [Y]es/[N]o: No

Command (m for help): wq

The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
```

Creating new partition of reduce size. Make sure to not wipe data else all metadat of the filesystem will be lost and hence your data will also be lost.

```
[root@ip-172-31-20-85 ~]# resize2fs /dev/xvdf1 6G
resize2fs 1.42.9 (28-Dec-2013)
The filesystem is already 1572864 blocks long.  Nothing to do!

[root@ip-172-31-20-85 ~]# mount /dev/xvdf1 /folder
[root@ip-172-31-20-85 ~]# cd /folder
[root@ip-172-31-20-85 folder]# ls
file.txt  lost+found
[root@ip-172-31-20-85 folder]# cat file.txt
"THis is first file"
[root@ip-172-31-20-85 folder]#
```

Mounted the folder and we can see the file still there after reducing partition size.