#list the blocks you attached
$ lsblk

#formating
$ mkfs.ext4 /dev/xvdf

```
Try 'mkfs --help' for more information.
ubuntu@ip-172-31-36-143:~$ lsblk
NAME       MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0        7:0    0  24.6M  1 loop /snap/amazon-ssm-agent/7528
loop1        7:1    0  55.7M  1 loop /snap/core18/2790
loop2        7:2    0  63.5M  1 loop /snap/core20/2015
loop3        7:3    0 111.9M  1 loop /snap/lxd/24322
loop4        7:4    0  40.8M  1 loop /snap/snapd/20092
xvda       202:0    0     8G  0 disk
├─xvda1    202:1    0   7.9G  0 part /
├─xvda14   202:14   0     4M  0 part
└─xvda15   202:15   0   106M  0 part /boot/efi
xvdf       202:80   0     5G  0 disk
ubuntu@ip-172-31-36-143:~$ mkfs.ext.4 /dev/xvdf
Command 'mkfs.ext.4' not found, did you mean:
  command 'mkfs.ext4' from deb e2fsprogs (1.46.5-2ubuntu1.1)
Try: sudo apt install <deb name>
ubuntu@ip-172-31-36-143:~$ mkfs.ext4 /dev/xvdf
mke2fs 1.46.5 (30-Dec-2021)
mkfs.ext4: Permission denied while trying to determine filesystem size
ubuntu@ip-172-31-36-143:~$ sudo mkfs.ext4 /dev/xvdf
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 1310720 4k blocks and 327680 inodes
Filesystem UUID: 5a88b05b-b795-44ca-86d6-3e3097ffdc2e
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736

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

ubuntu@ip-172-31-36-143:~$ 
```

#make a directory
$ mkdir /test/


```
ubuntu@ip-172-31-36-143:~$ mkdir /test
mkdir: cannot create directory '/test': Permission denied
ubuntu@ip-172-31-36-143:~$ sudo !!
sudo mkdir /test
ubuntu@ip-172-31-36-143:~$ sudo su
root@ip-172-31-36-143:/home/ubuntu# cd /
root@ip-172-31-36-143:/# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  lost+found  media  mnt  opt  proc  root  run  sbin  snap  srv  sys  test      usr  var
root@ip-172-31-36-143:/# mount /dev/xvdf /test/
root@ip-172-31-36-143:/# mountpoint /test
/test is a mountpoint
root@ip-172-31-36-143:/# touch abc def ghi jklm nop qrst uvwx yz
root@ip-172-31-36-143:/# echo "hello" > file1.txt
root@ip-172-31-36-143:/# ls
abc  boot  dev  file1.txt  home  lib     lib64  lost+found  mnt  opt   qrst  run   snap  sys      uvwx  yz
bin  def   etc  ghi        jklm  lib32  libx32  media            nop  proc  root  sbin  srv   test  usr   var
```

#mounting between the volume and directory
$ mount /dev/xvdf /test/
#checking mounted or not
$ mountpoint /test/
#unmounting
$ umount /test/

```
root@ip-172-31-36-143:/# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  lost+found  media  mnt  opt  proc  root  run  sbin  snap  srv  sys  test  tmp  usr  var
root@ip-172-31-36-143:/# mount /dev/xvdf /test/
root@ip-172-31-36-143:/# mountpoint /test
/test is a mountpoint
root@ip-172-31-36-143:/# touch abc def ghi jklm nop qrst uvwx yz
root@ip-172-31-36-143:/# echo "hello" > file1.txt
root@ip-172-31-36-143:/# ls
abc  boot  dev  file1.txt  home  lib     lib64   lost+found  mnt  opt   qrst  run   snap  sys   tmp  uvwx  yz
bin  def   etc  ghi        jklm  lib32  libx32  media            nop  proc  root  sbin  srv   test  usr  var
root@ip-172-31-36-143:/# mv abc def ghi jklm nop qrst uvwx yz /test/
root@ip-172-31-36-143:/# ls
bin  boot  dev  etc  file1.txt  home  lib  lib32  lib64  libx32  lost+found  media  mnt  opt  proc  root  run  sbin  snap  srv  sys  test  tmp  usr  var
root@ip-172-31-36-143:/# mv file1.txt /test/
root@ip-172-31-36-143:/# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  lost+found  media  mnt  opt  proc  root  run  sbin  snap  srv  sys  test  tmp  usr  var
root@ip-172-31-36-143:/# umount /test/
root@ip-172-31-36-143:/# mountpoint /test
/test is not a mountpoint
root@ip-172-31-36-143:/# lsblk
NAME      MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0       7:0    0  24.6M  1 loop /snap/amazon-ssm-agent/7528
loop1       7:1    0  55.7M  1 loop /snap/core18/2790
loop2       7:2    0  63.5M  1 loop /snap/core20/2015
loop3       7:3    0 111.9M  1 loop /snap/lxd/24322
loop4       7:4    0  40.8M  1 loop /snap/snapd/20092
xvda      202:0    0     8G  0 disk
├─xvda1   202:1    0   7.9G  0 part /
├─xvda14  202:14   0     4M  0 part
└─xvda15  202:15   0   106M  0 part /boot/efi
root@ip-172-31-36-143:/# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  lost+found  media  mnt  opt  proc  root  run  sbin  snap  srv  sys  test  tmp  usr  var
root@ip-172-31-36-143:/#
```

#we can resize manually,and we can see by bellow command.df command displays the amount of disk space available on the file system.
$ df -h
#we can resize volume block but can't file system,we need to resize file system too by below cmd.
$ resize2fs /dev/xvdf
$ df -h (now we can use the block storage which we increased).
#we can't decrease the block storage size but we can do one thing that is we can create another volume and mount it and transfer the data from first volume.
#we can increase the root volume manually and following the bellow steps.
$ lsblk (#list the blocks,here we can see the block size increased)
$ df -h (#here we coudn't see the increased size)
#we can't decrease the block storage size but we can do one thing that is we can create another volume and mount it and transfer the data from first volume.
#we can increase the root volume manually and following the bellow steps.
$ lsblk (#list the blocks,here we can see the block size increased)
$ df -h (#here we coudn't see the increased size)
$ file -s /dev/xvdf1 (#this cmd checking that which file system it has)
$ resize2fs /dev/xvdf1 (here we get nothing to do,because we resize first partitions for that we use 'growpart'cmd)
$ growpart /dev/xvdf 1 (here we grows partition but not it's file system)
$ df -h
$ resize2fs /dev/xvdf1
$ df -h

$ file -s /dev/xvdf1 (#this cmd checking that which file system it has)

```
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-1012-aws x86_64)

 * Documentation:  https://help.ubuntu.com
ubuntu@ip-172-31-37-56:~$ sudo su
root@ip-172-31-37-56:/home/ubuntu# lsblk
NAME      MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0       7:0    0  24.6M  1 loop /snap/amazon-ssm-agent/7528
loop1       7:1    0  55.7M  1 loop /snap/core18/2790
loop2       7:2    0  63.5M  1 loop /snap/core20/2015
loop3       7:3    0 111.9M  1 loop /snap/lxd/24322
loop4       7:4    0  40.8M  1 loop /snap/snapd/20092
xvda      202:0    0    16G  0 disk
├─xvda1   202:1    0   7.9G  0 part /
├─xvda14  202:14   0     4M  0 part
└─xvda15  202:15   0   106M  0 part /boot/efi
root@ip-172-31-37-56:/home/ubuntu# df -h
Filesystem     Size  Used Avail Use% Mounted on
/dev/root      7.6G  1.6G  6.0G  21% /
tmpfs          475M     0  475M   0% /dev/shm
tmpfs          190M  828K  190M   1% /run
tmpfs          5.0M     0  5.0M   0% /run/lock
/dev/xvda15    105M  6.1M   99M   6% /boot/efi
tmpfs           95M  4.0K   95M   1% /run/user/1000
root@ip-172-31-37-56:/home/ubuntu# growpart /dev/xvda 1
CHANGED: partition=1 start=227328 old: size=16549855 end=16777183 new: size=33327071 end=33554399
root@ip-172-31-37-56:/home/ubuntu# df -h
Filesystem     Size  Used Avail Use% Mounted on
/dev/root      7.6G  1.6G  6.0G  21% /
tmpfs          475M     0  475M   0% /dev/shm
tmpfs          190M  828K  190M   1% /run
tmpfs          5.0M     0  5.0M   0% /run/lock
/dev/xvda15    105M  6.1M   99M   6% /boot/efi
tmpfs           95M  4.0K   95M   1% /run/user/1000
root@ip-172-31-37-56:/home/ubuntu# resize2fs /dev/xvda1
resize2fs 1.46.5 (30-Dec-2021)
Filesystem at /dev/xvda1 is mounted on /; on-line resizing required
old_desc_blocks = 1, new_desc_blocks = 2
The filesystem on /dev/xvda1 is now 4165883 (4k) blocks long.

root@ip-172-31-37-56:/home/ubuntu# df -h
Filesystem     Size  Used Avail Use% Mounted on
/dev/root       16G  1.6G   14G  11% /
tmpfs          475M     0  475M   0% /dev/shm
tmpfs          190M  828K  190M   1% /run
tmpfs          5.0M     0  5.0M   0% /run/lock
/dev/xvda15    105M  6.1M   99M   6% /boot/efi
tmpfs           95M  4.0K   95M   1% /run/user/1000
root@ip-172-31-37-56:/home/ubuntu#
```

###

1.EBS multi attach possible for only io2 type of EBS in some other regions io1 may support.

2.here the EBS multi attach supports only for nitro based instances (ex:t3) but not the xen based
   Instances (ex:t2).

3.so create t3.micro instances,if we created t2 just stop the instances and modify the instance
   Type.

4.

Create volume *Info*

Create an Amazon EBS volume to attach to any EC2 instance in the same Availability Zone.

Volume settings

Volume type | Info

Provisioned IOPS SSD (io2) ▼

ⓘ Provisioned IOPS SSD (io2) volumes with a size greater than 16 TiB, IOPS greater than 64,000, or IOPS:GiB ratio greater than 500:1 are supported only with instance types that support io2 Block Express.

Size (GiB) | Info

100

Min: 4 GiB, Max: 65536 GiB. The value must be an integer.

IOPS | Info

3000

Min: 100 IOPS, Max: 100000 IOPS (up to 1000 IOPS per GiB)

Throughput (MiB/s) | Info

Not applicable

Availability Zone | Info

ap-south-1a ▼

Snapshot ID - optional | Info

Don't create volume from a snapshot ▼

Amazon EBS Multi-Attach | Info

☑ Enable Multi-Attach

Volume ID

vol-05ddc78de8063b6b8

Availability Zone

ap-south-1a

Instance   Info

i-0bee74b999fc0a296   ▼   ⟳

Only instances in the same Availability Zone as the selected volume are displayed.

Device name   Info

/dev/sdf

Recommended device names for Linux: /dev/sda1 for root volume. /dev/sd[f-p] for data volumes.

ⓘ Newer Linux kernels may rename your devices to **/dev/xvdf** through **/dev/xvdp** internally, even when the device name entered here (and shown in the details) is **/dev/sdf** through **/dev/sdp.**

⊗ 'vol-05ddc78de8063b6b8' is multi-attach enabled and 't2.micro' does not support multi-attach enabled volumes.

Cancel   **Attach volume**

Stop instances?   ✕

Instance IDs

  i-0bee74b999fc0a296 (ec2-1)
  i-0da9dec5551de132d (ec2-2)

To confirm that you want to stop the instances, choose the *Stop* button below.

Cancel   **Stop**

Instance type changed successfully

Instances (1/3) Info

	Name	Instance ID	Instance state	Instance type	Status		Availability 2
☐	open-vidu	i-02f8dff10ec5c9c6b	⊖ Stopped				ap-south-1b
☐	ec2-1	i-0bee74b999fc0a296	⊖ Stopped				ap-south-1a
☑	ec2-2	i-0da9dec5551de132d	⊖ Stopped				ap-south-1a

Actions menu:
- Connect
- View details
- Manage instance state
- Instance settings ▶
- Networking ▶
- Security ▶
- Image and templates ▶
- Monitor and troubleshoot ▶

Instance settings submenu:
- Attach to Auto Scaling Group
- Change termination protection
- Change stop protection
- Change shutdown behavior
- Change auto-recovery behavior
- Change instance type
- Change Nitro Enclaves
- Change credit specification
- Change resource based naming options
- Modify instance placement
- Modify Capacity Reservation settings
- Edit user data
- Allow tags in instance metadata

Instance: i-0da9dec5551de132d (ec2-2)

Details | Security | Networking | Storage | Status checks | Moni

▼ Instance summary Info

Instance ID
🗗 i-0da9dec5551de132d (ec2-2)

Public IPv4 address
–

IPv6 address
–

Instance state
⊖ Stopped

Hostname type
IP name: ip-172-31-34-225.ap-south-1.compute.internal

Private IP DNS name (IPv4 only)
🗗 ip-172-31-34-225.ap-south-1.compute.internal

EC2 > Instances > i-0da9dec5551de132d > Change instance type

Change instance type Info

You can change the instance type only if the current instance type and the instance type that you want are compatible.

Instance ID
🗗 i-0da9dec5551de132d (ec2-2)

Current instance type
t2.micro

Instance type
t3.micro ▼

☑ EBS-optimized
EBS-optimized is enabled by default for this instance type

Cancel   Apply

Volumes (1/4) Info   ↻   Actions ▼   **Create volume**

🔍 Search   ‹ 1 › ⚙

☐	Name	▽	Volume ID	▽	Type	▽	Size	▽	IOPS	▽	Throughput	▽	Snapshot	▽	Created
☐	-		vol-0b8e12ba149061e70		gp2		200 GiB		600		-		snap-0b3ca2c...		2023/10/16 16:07 GI
☐	-		vol-03c610fbd40545bd9		gp2		16 GiB		100		-		snap-040e3cc...		2023/11/15 11:37 GI
☐	-		vol-0bcf6c65dd4f9ed0b		gp2		8 GiB		100		-		snap-040e3cc...		2023/11/15 11:37 GI
☑	-		vol-05ddc78de8063b6b8		Io2		5 GiB		100		-		-		2023/11/15 12:06 GI

═

Volume ID: vol-05ddc78de8063b6b8   ⚙ ✕

ⓘ Opt-in to AWS Compute Optimizer for recommendations. | Learn more ⬈   ✓ In-use   100   -

Encryption   KMS key ID   KMS key alias   KMS key ARN
Not encrypted   -   -   -

Fast snapshot restored   Snapshot   Availability Zone   Created
No   -   ap-south-1a   🗇 Wed Nov 15 2023 12:06:56
                                                                               GMT+0530 (India Standard Time)

Multi-Attach enabled   Attached Instances   Outposts ARN
Yes   2 attached   -

EC2 > Volumes > vol-09d1659dacf5a7bd1 > Modify volume

Modify volume Info

Modify the type, size, and performance of an EBS volume.

Volume details

Volume ID

🗇 vol-09d1659dacf5a7bd1

Volume type | Info

General Purpose SSD (gp3)   ▼

Size (GiB) | Info

8   ▲▼

⚠ The size of a volume can only be increased, not decreased.
Min: 1 GiB, Max: 16384 GiB. The value must be an integer.

IOPS | Info

3000

Min: 3000 IOPS, Max: 16000 IOPS. The value must be an integer.