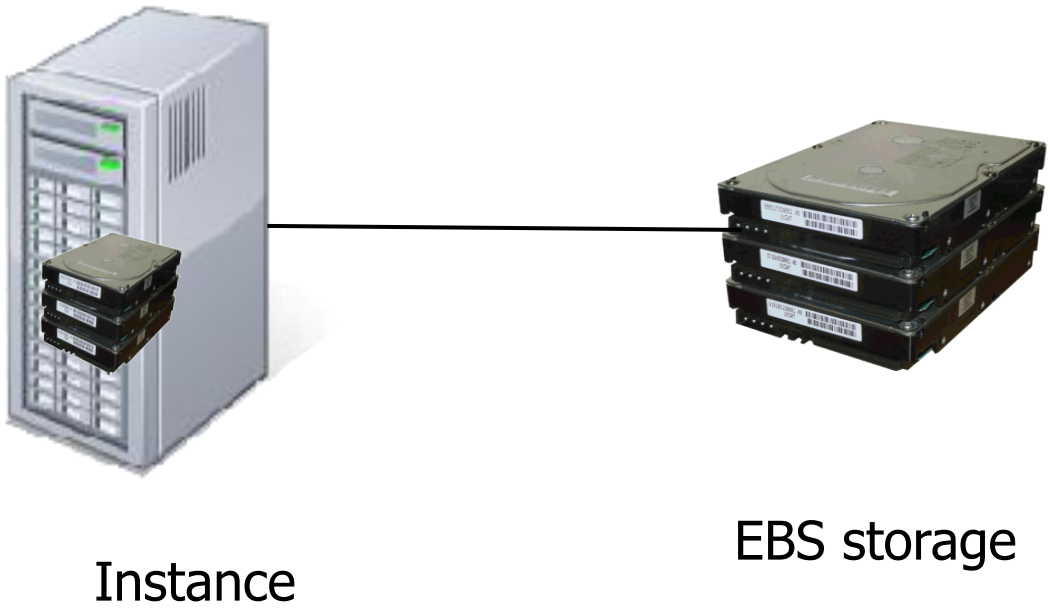
Elastic Block Store (EBS)

What is Elastic Block Store (EBS)?



- **Persistent storage**
  - Unlike the local instance store, data stored in EBS is not lost when an instance fails or is terminated

- **Should I use the instance store or EBS?**
  - Typically, instance store is used for temporary data

- **EBS storage is allocated in volumes**
  - A volume is a 'virtual disk' (size: 1GB - 1TB)
  - Basically, a raw block device
  - Can be attached to an instance (but only one at a time)
  - A single instance can access multiple volumes

- **Placed in specific availability zones**
  - Why is this useful?
  - Be sure to place it near instances (otherwise can't attach)

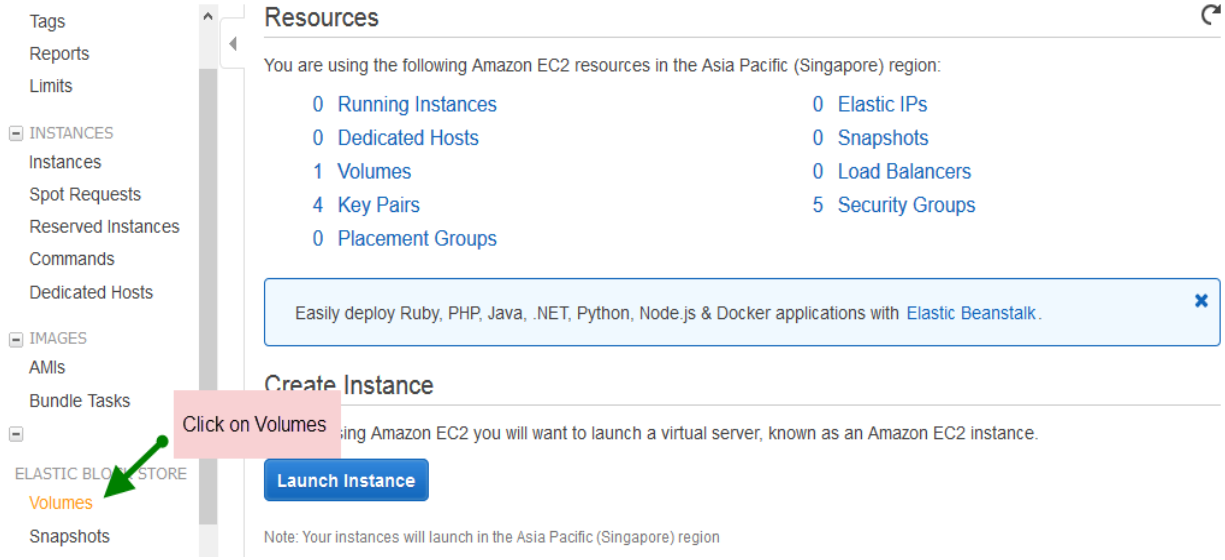
- **Replicated across multiple servers**
  - Data is not lost if a single server fails
  - Amazon: Annual failure rate is 0.1-0.2%

- **EC2 instances can have an EBS volume as their root device ("EBS boot")**

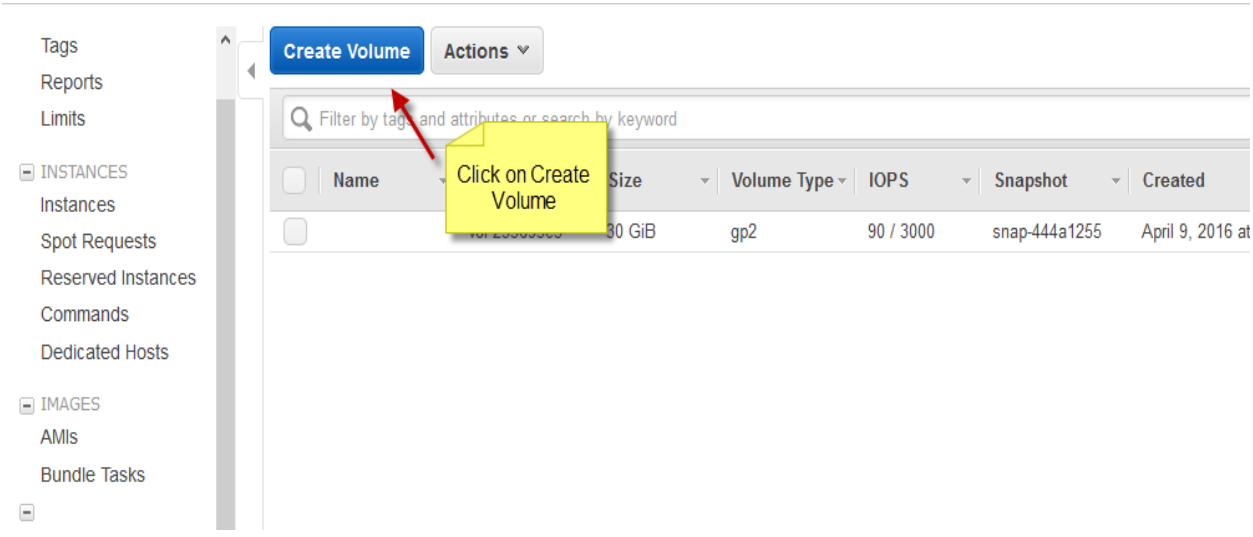
  - Result: Instance data persists independently from the lifetime of the instance
  - You can stop and restart the instance, similar to suspending and resuming a laptop
    - You won't be charged for the instance while it is stopped (only for EBS)
  - You can enable termination protection for the instance
    - Blocks attempts to terminate the instance (e.g., by accident) until termination protection is disabled again

CREATEEBS VOLUMES

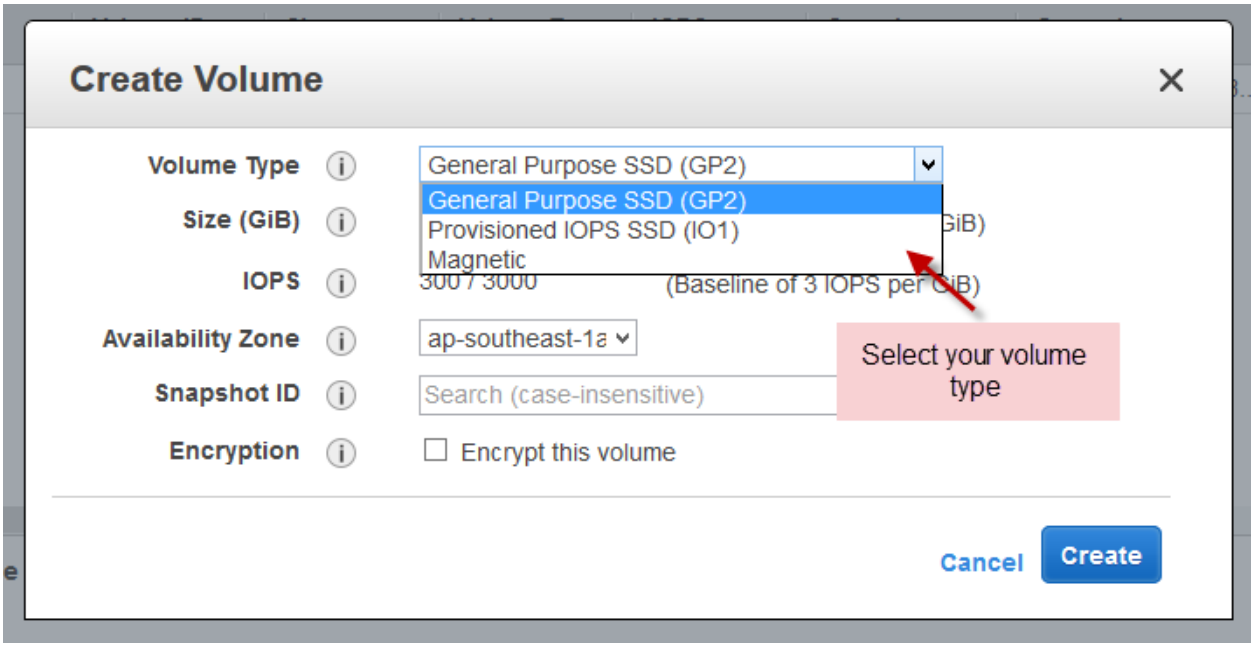
Once you are in the EC2 page, click Volumes under ELASTIC BLOCK STORE on the left pane.



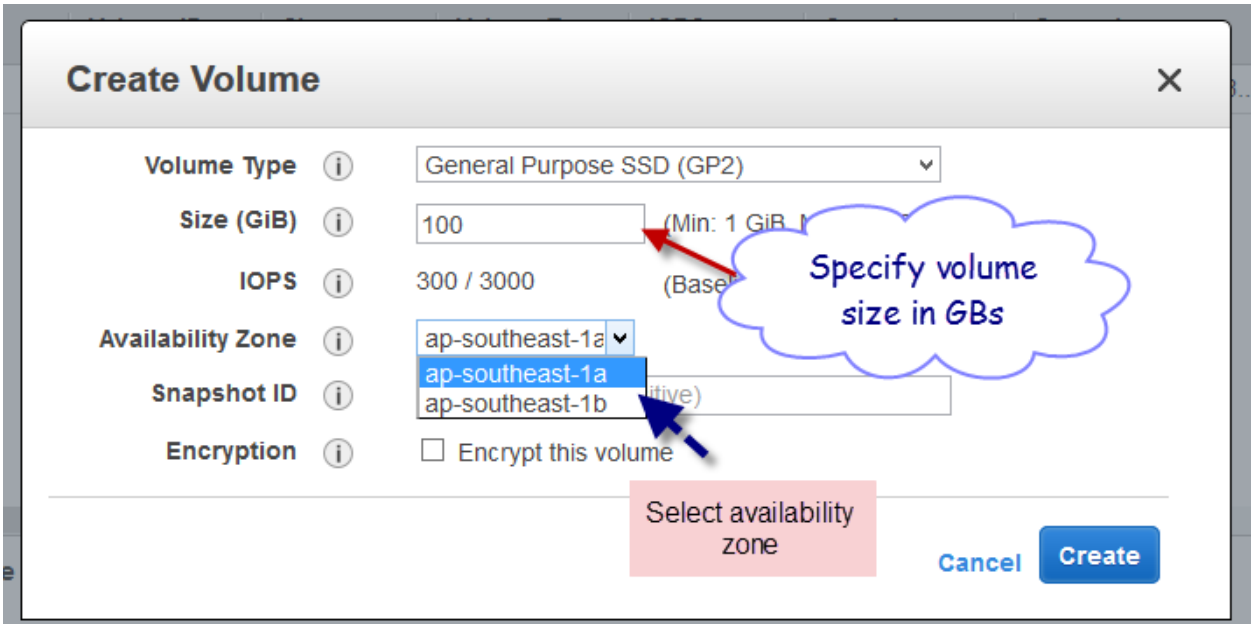
Once you are in the Volumes page, click on Create Volume to create a new volume.



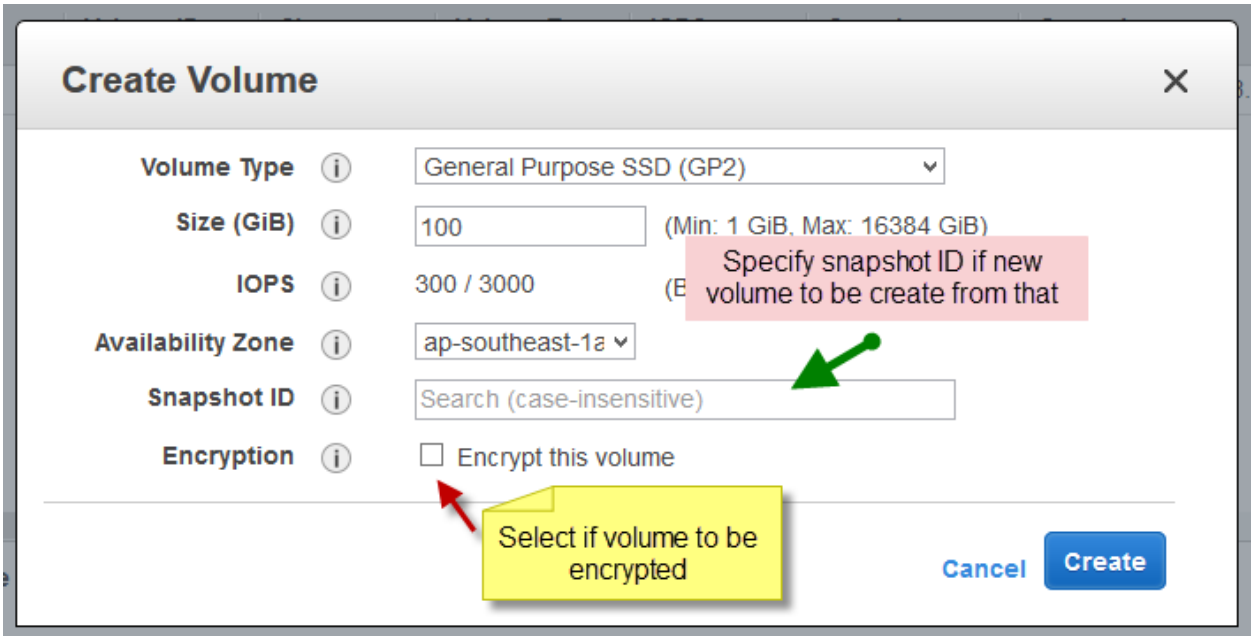
A pop up window will come and there you need to specify the volume specifications.
Select Volume Type from the drop down list.



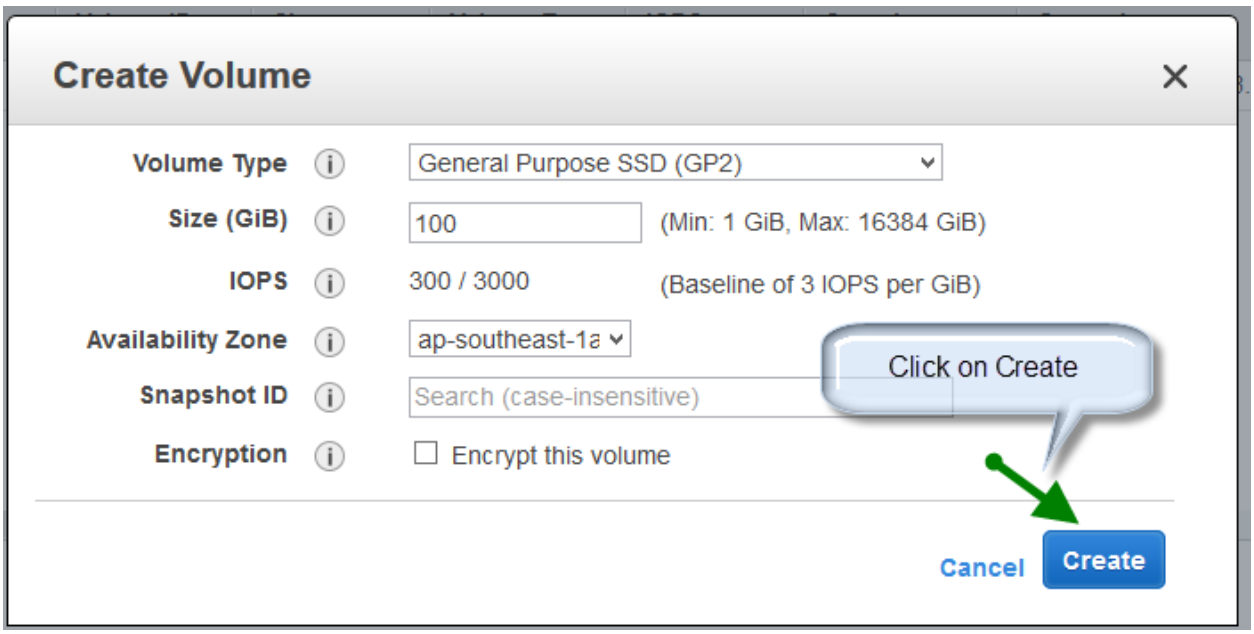
Specify volume size in GBs in Size text field and select availability zone from drop down list in which availability zone you want to create your volume.



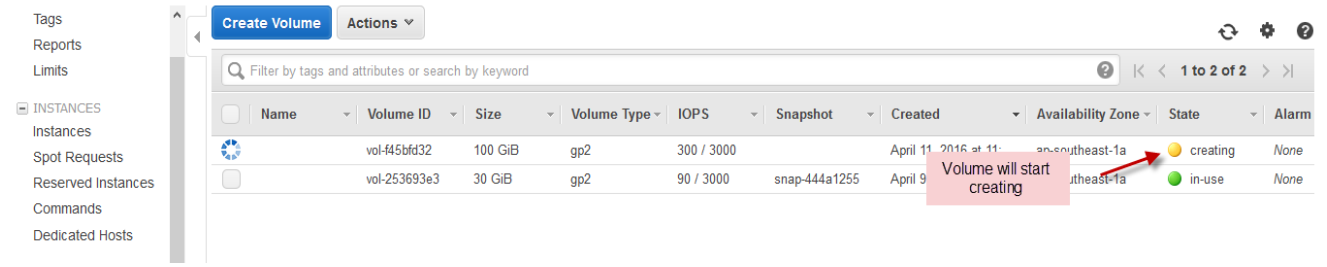
Specify Snapshot ID if you want your new volume to be copied data from the snapshot, otherwise leave blank.
And select encrypt option if you want to encrypt your newly creating volume, otherwise leave un selected.



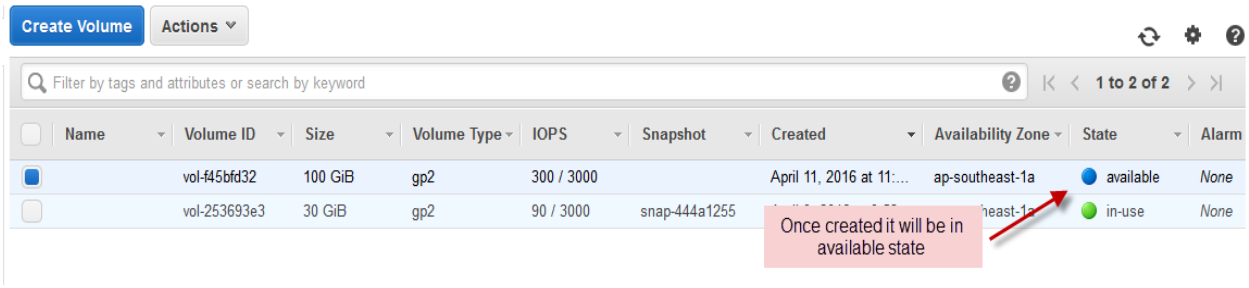
Then click on create after specifying the values required.



Your volume will start creating.

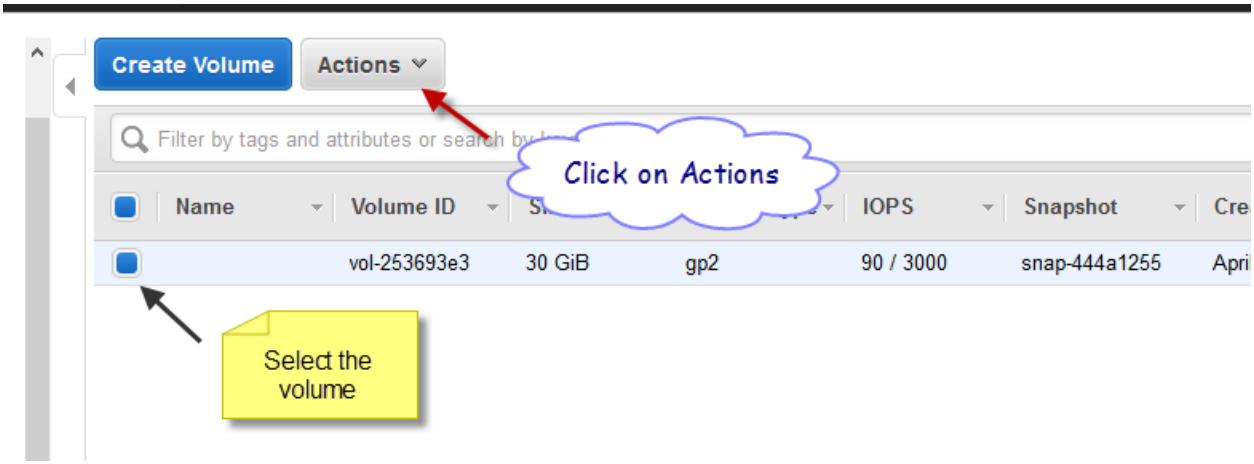


Once created it will be available state under volumes section.

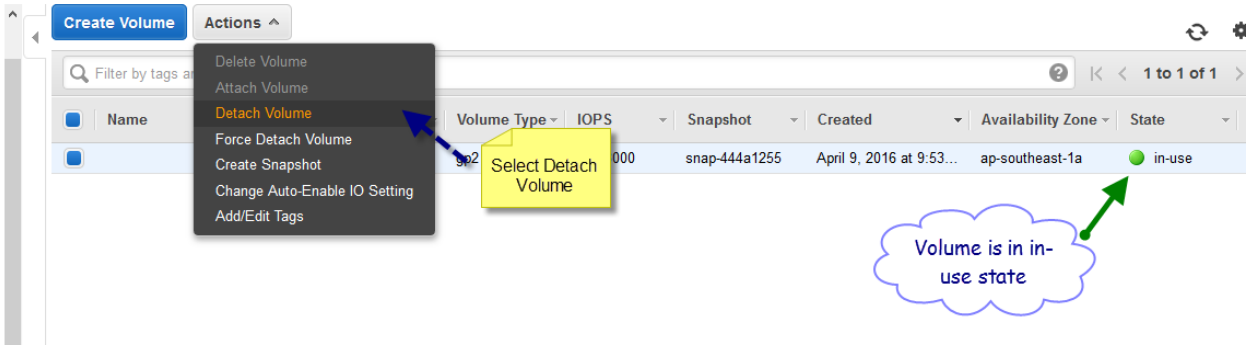


DELETE EBS VOLUME

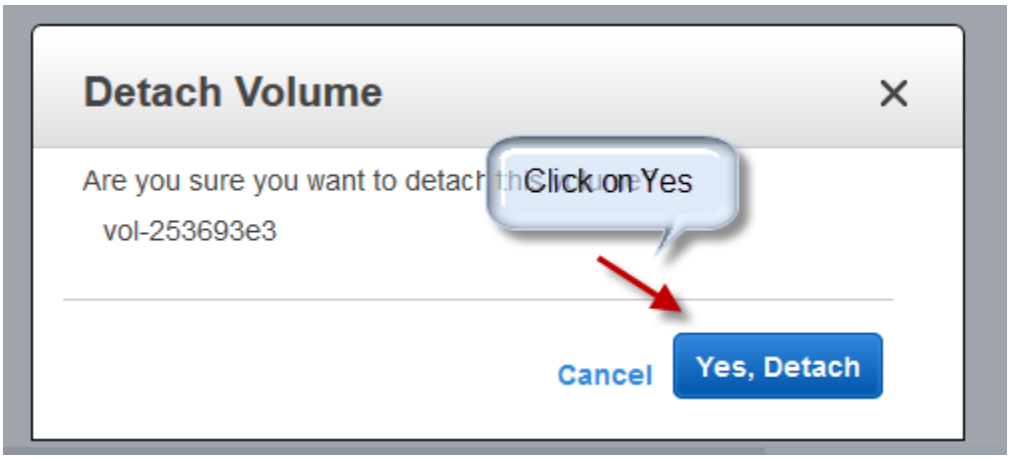
Once you logged in to AWS, go to EC2 section then go to Volumes section. Click the volume which you want to delete and click on actions.



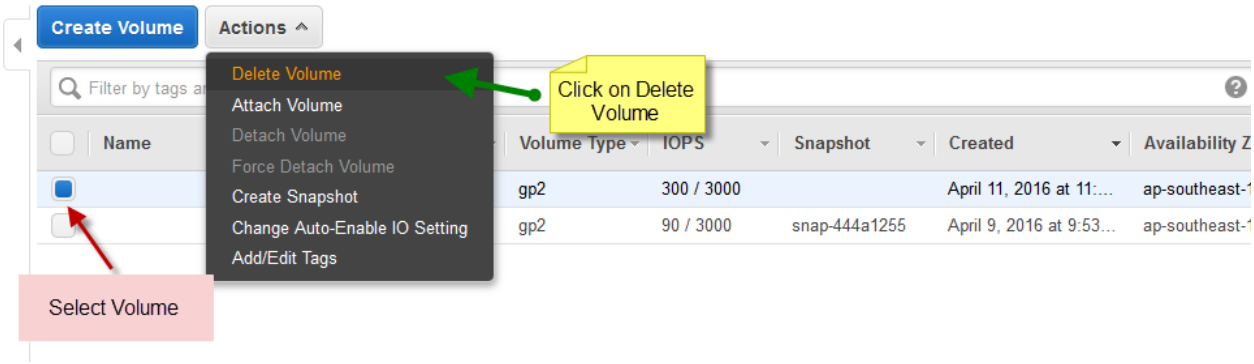
From the Actions menu select Detach Volume as you can see volume state is in **in-use**and those Delete volume option is un selectable.



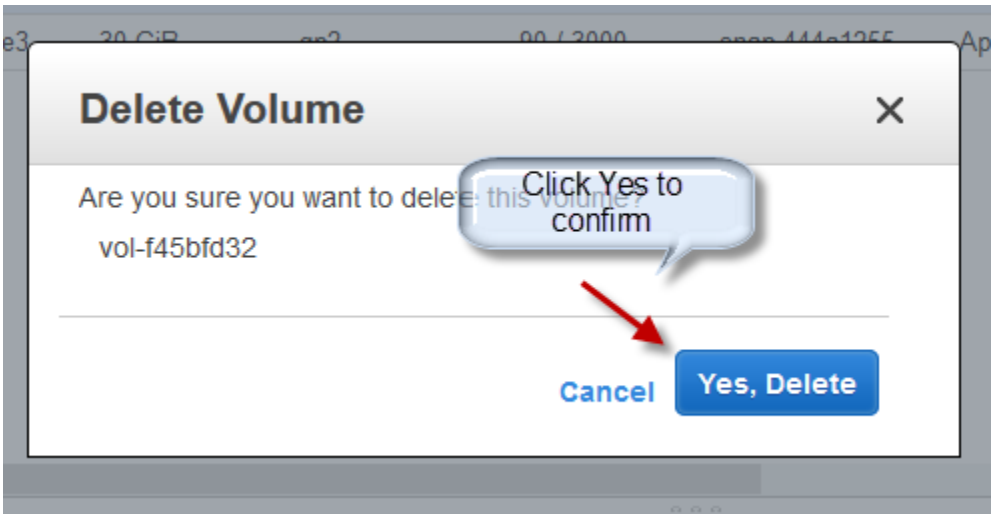
Click on Yes, Detach to detach volume from instance.



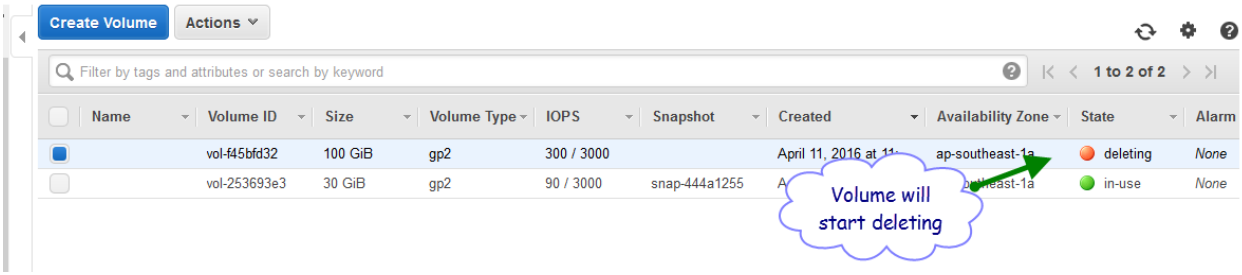
Select Volume which you want to delete then click on actions and select Delete Volume from the list.



A pop up window will come for confirmation, then click on Yes, Delete to delete.

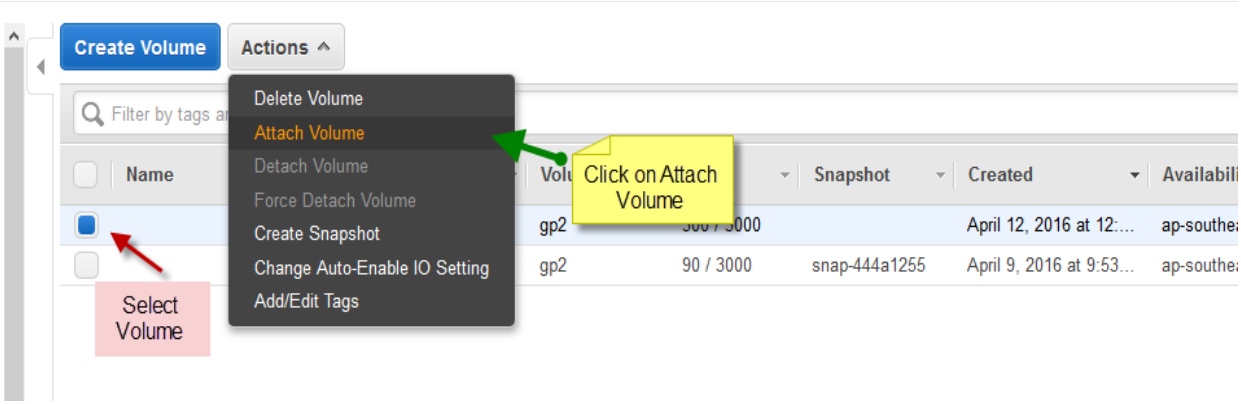


Volume will delete and the State will change to deleting.

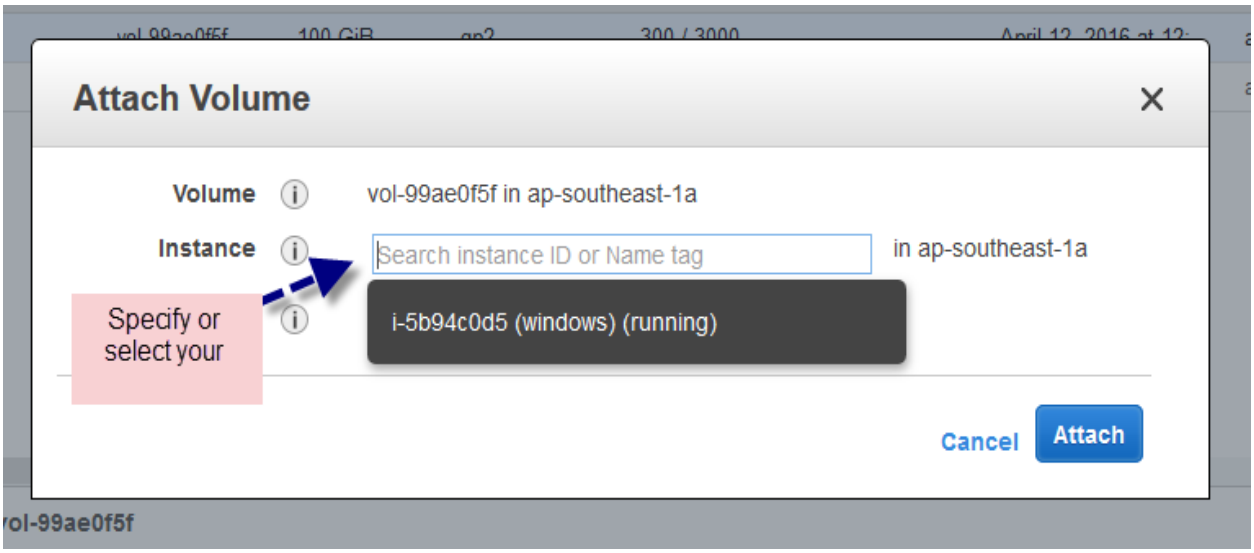


ATTACHING AND MOUNTING VOLUMES TO WINDOWS INSTANCES

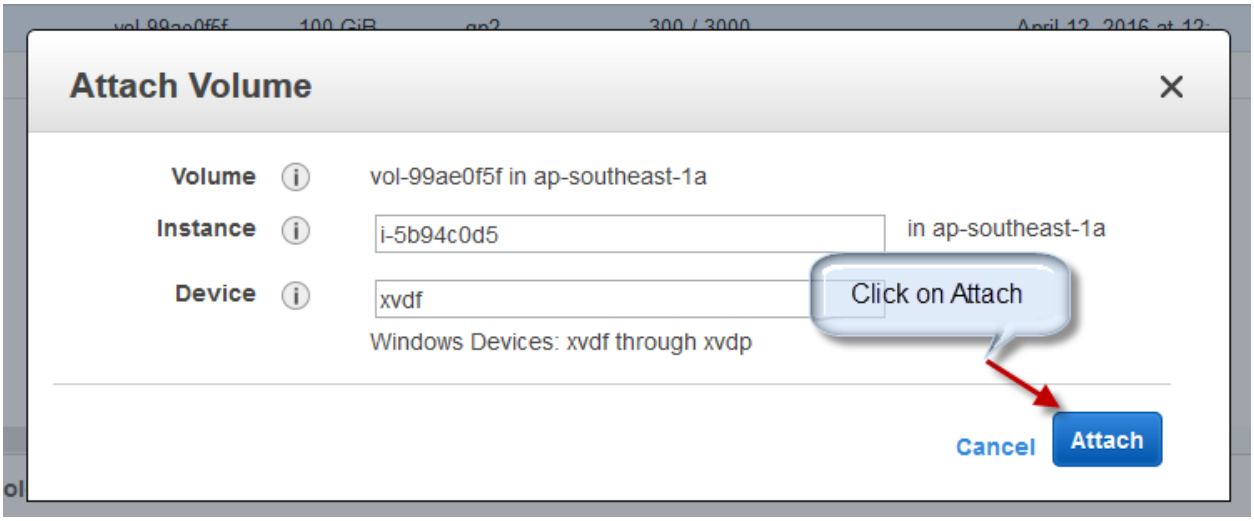
Go to volumes section and create a volume, make sure you select the availability zone same as your instance is residing.
Once created select the Volume and click on actions and select Attach Volume.



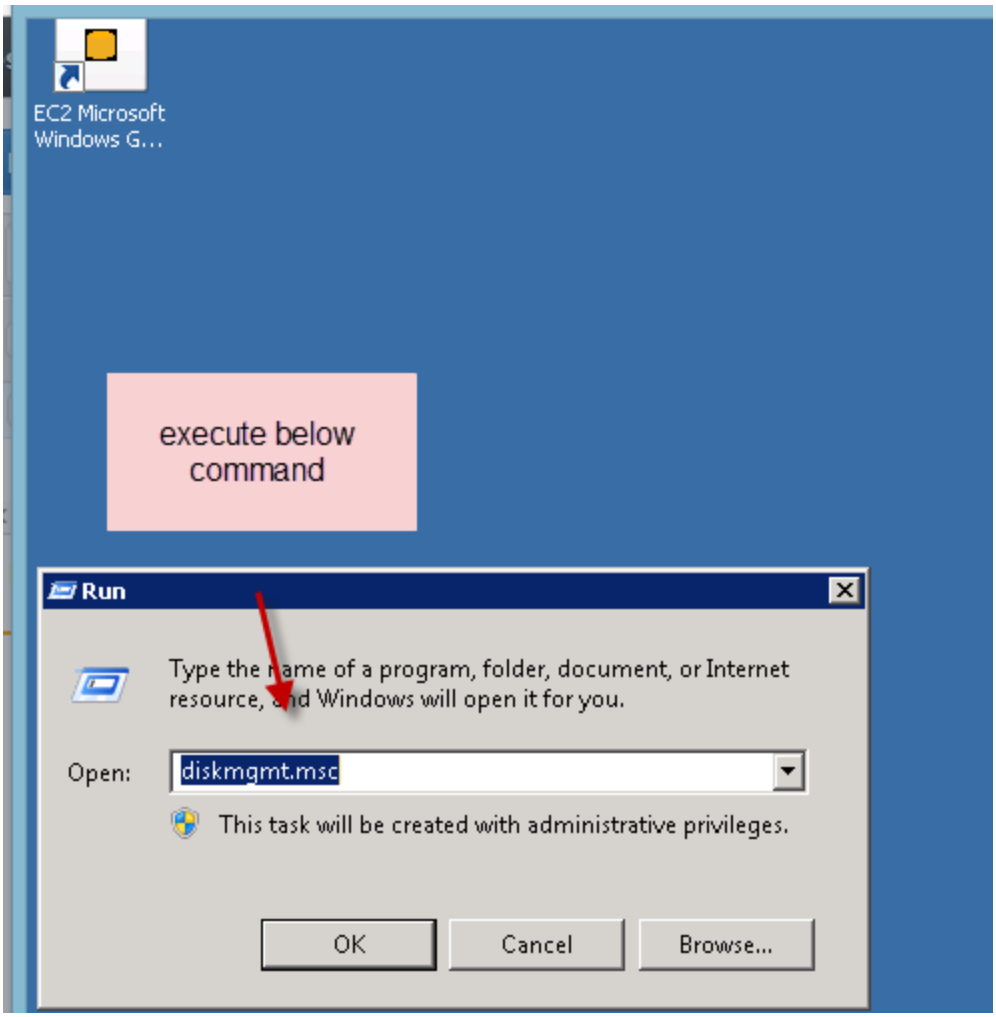
In the next page Select or search in the Instance text field and select your instance.



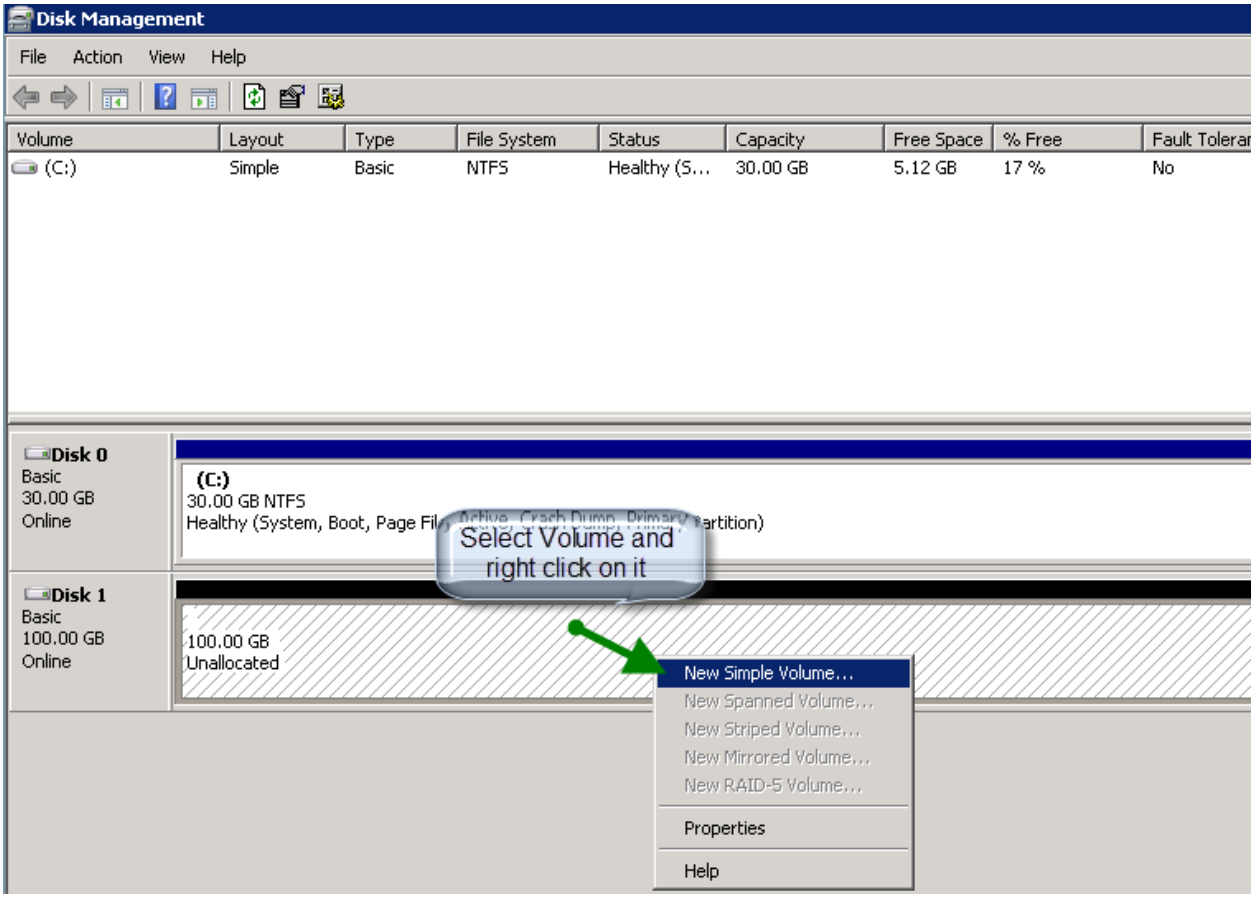
Then click on Attach button.



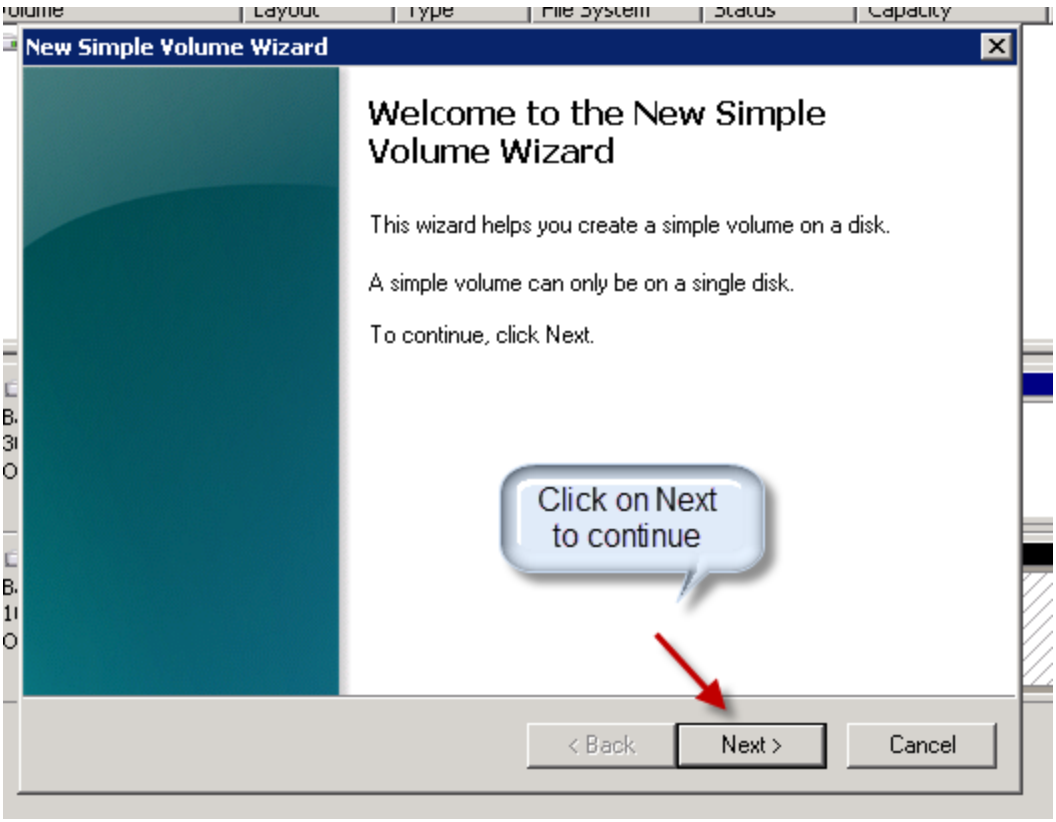
Then go and login to your instance, after logged in open Run and execute diskmgmt.msc command to open storage volumes attached to instance.



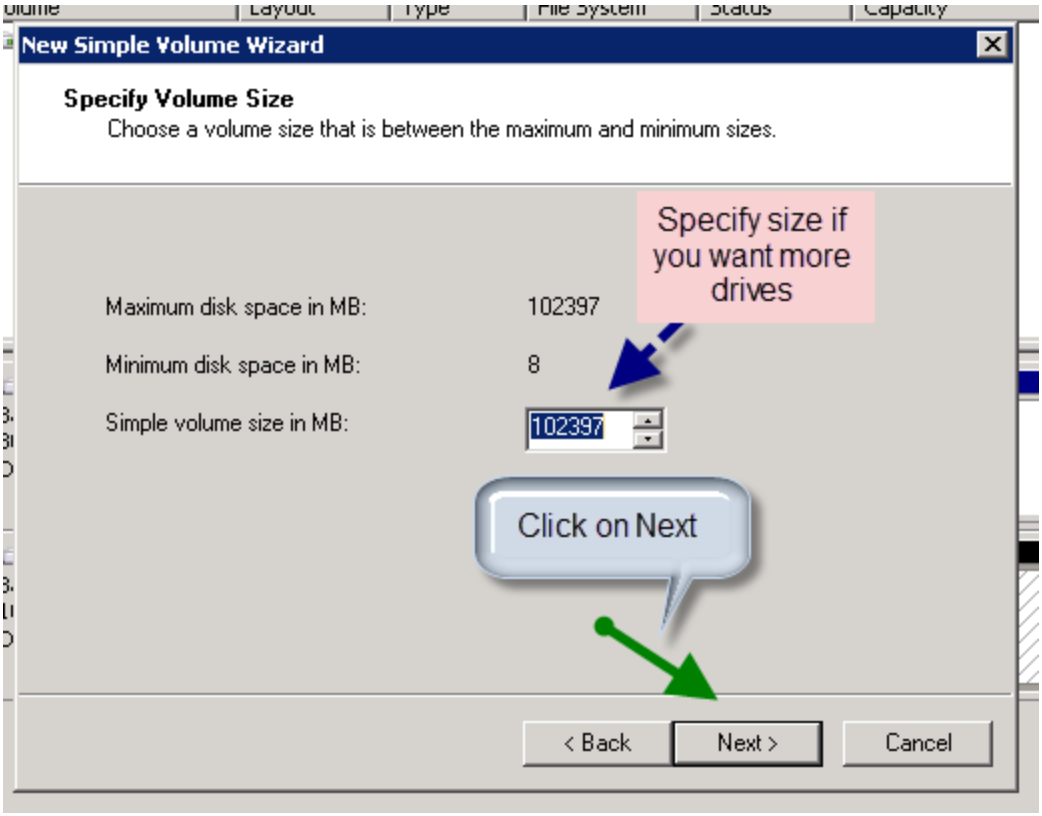
Then in the disk management screen select the volume which we have created and do a right click on the volume.



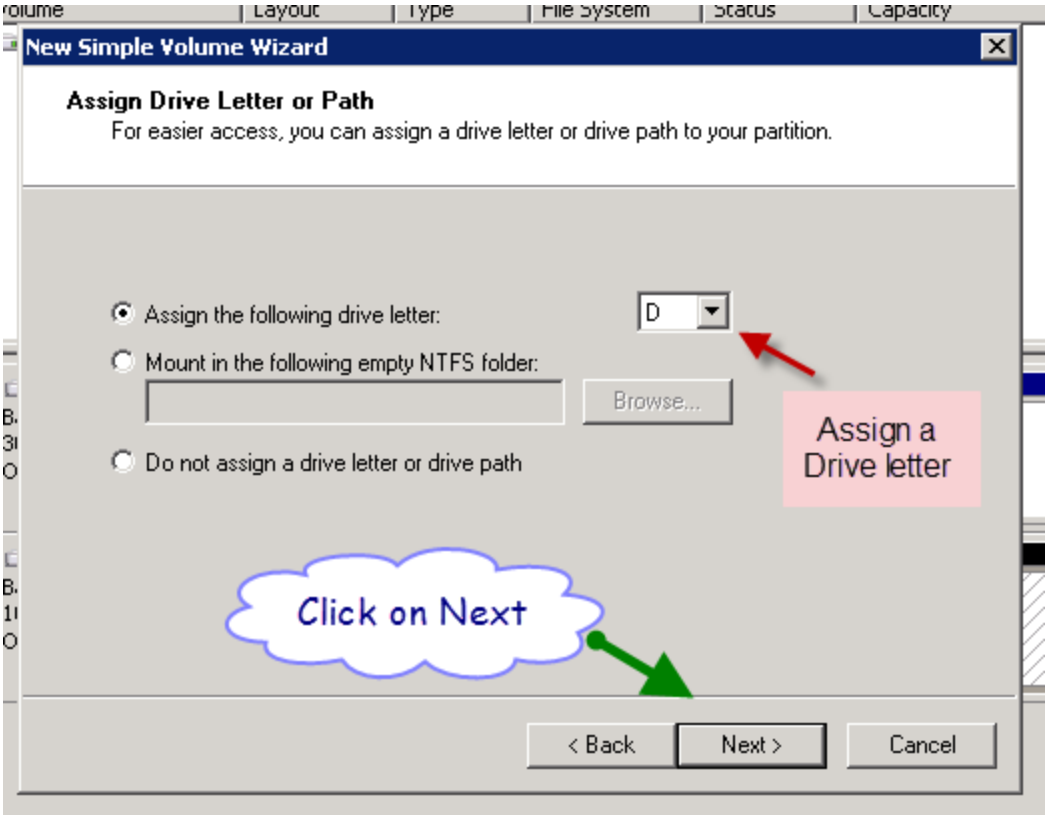
Click on Next to continue.



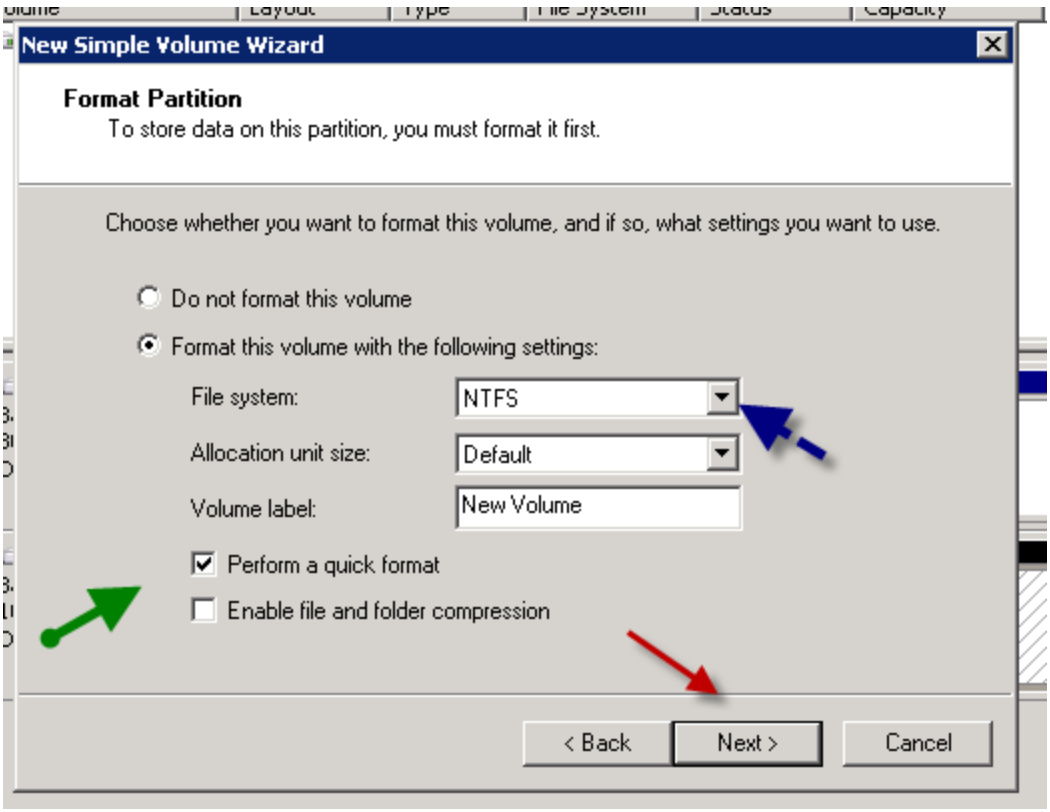
In the following screen specify size if you want to create more drives or leave as full size and click on Next.



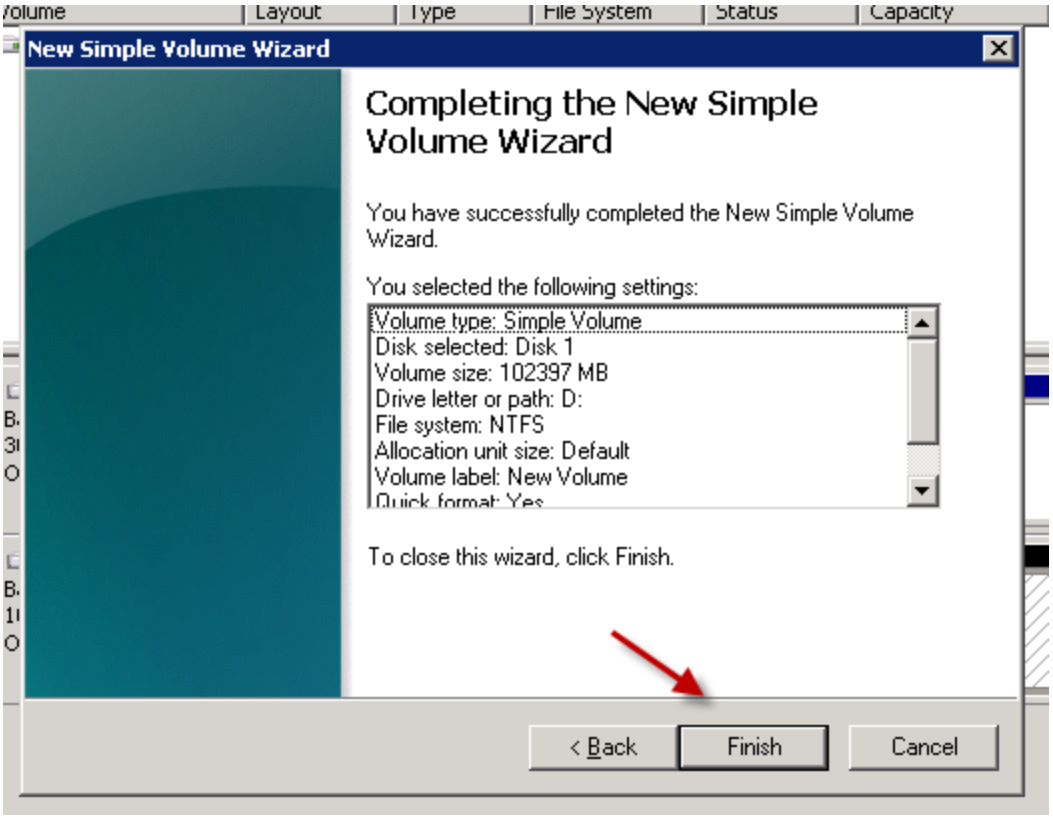
Specify a drive for the newly creating volume and click on Next.



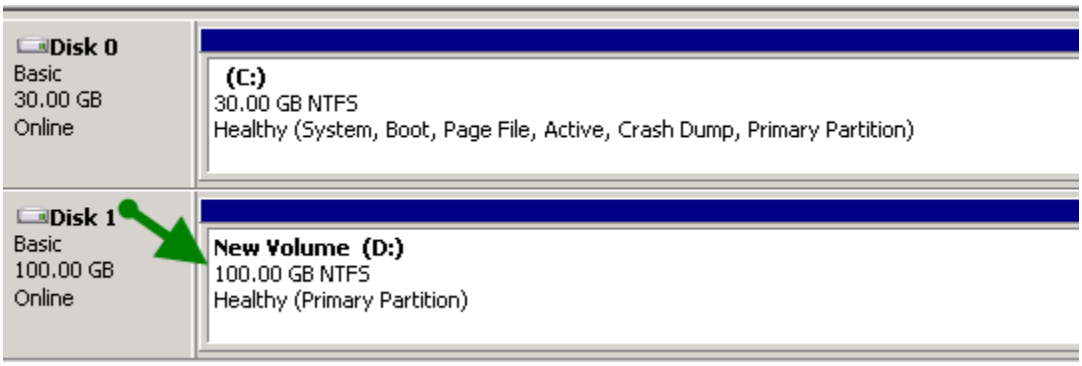
In the screen go with default selections and click on Next.



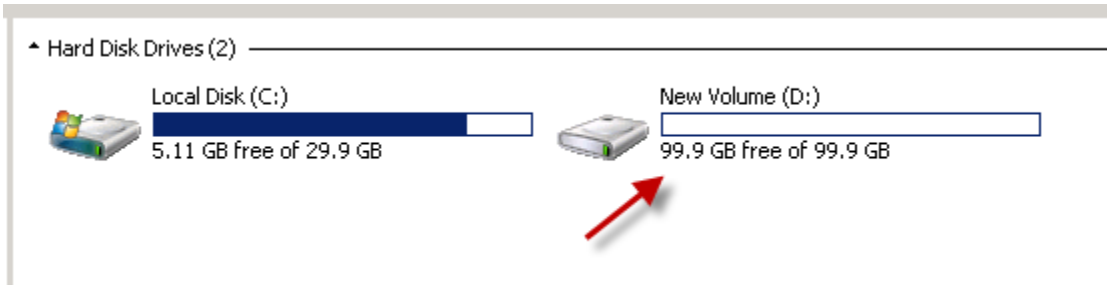
On the next screen click finish to complete the setup.



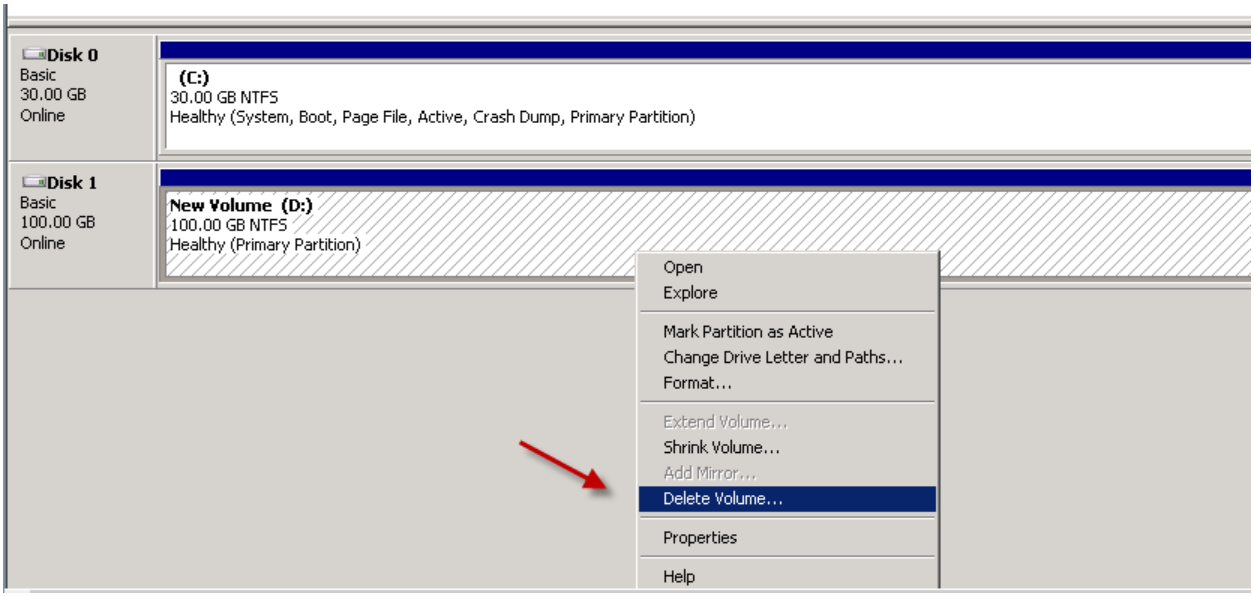
After formatting it will show as Healthy, then close disk management console.



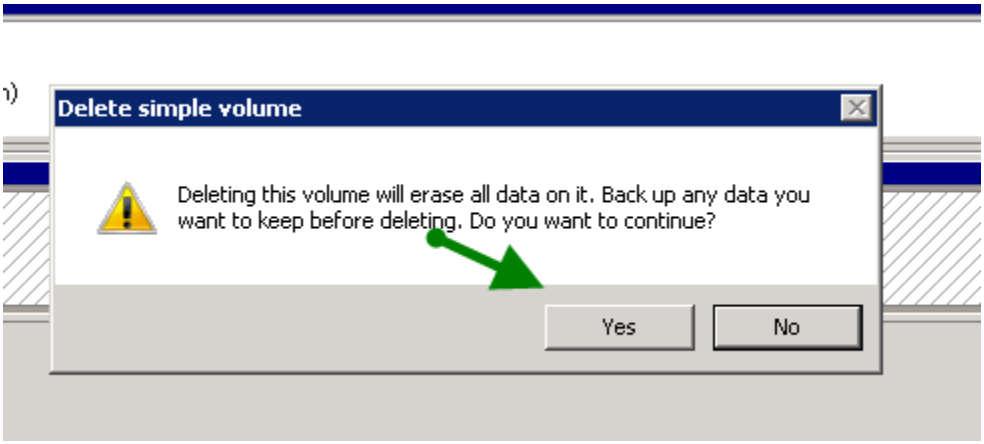
Open My Computer to see the newly formatted volume.



To unmount the Volume, once again open run and execute diskmgmt.msc to disk management console.
Then select your volume and right click on it and select Delete Volume.

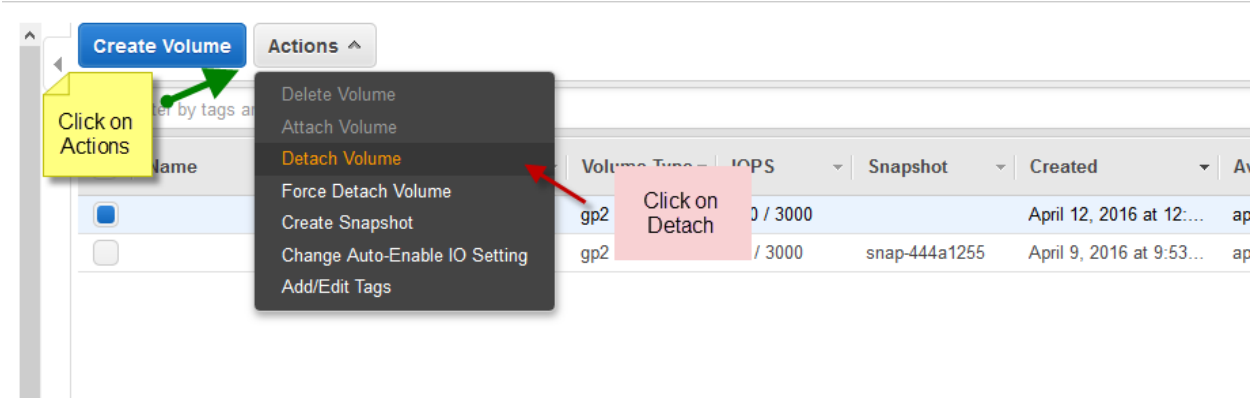


Click yes to confirm.

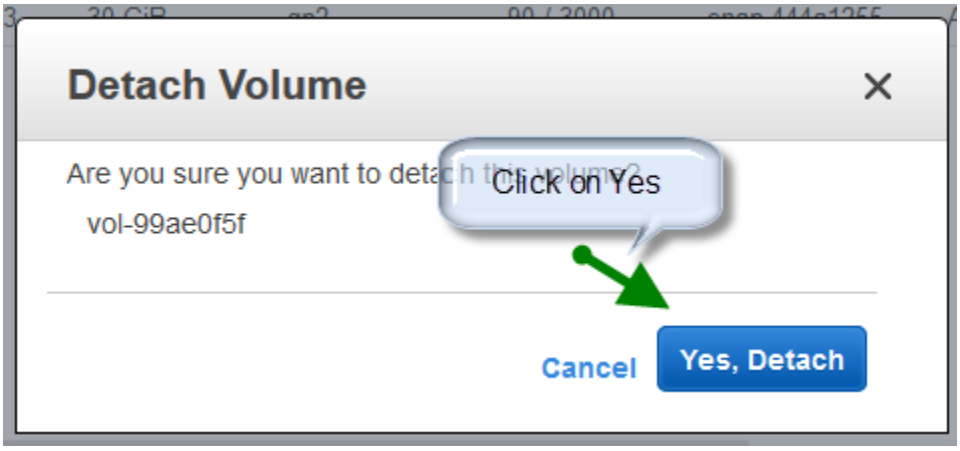


Then go to Volumes section on the EC2 page on AWS console.

Select the volume and go to Actions click on Detach Volume.

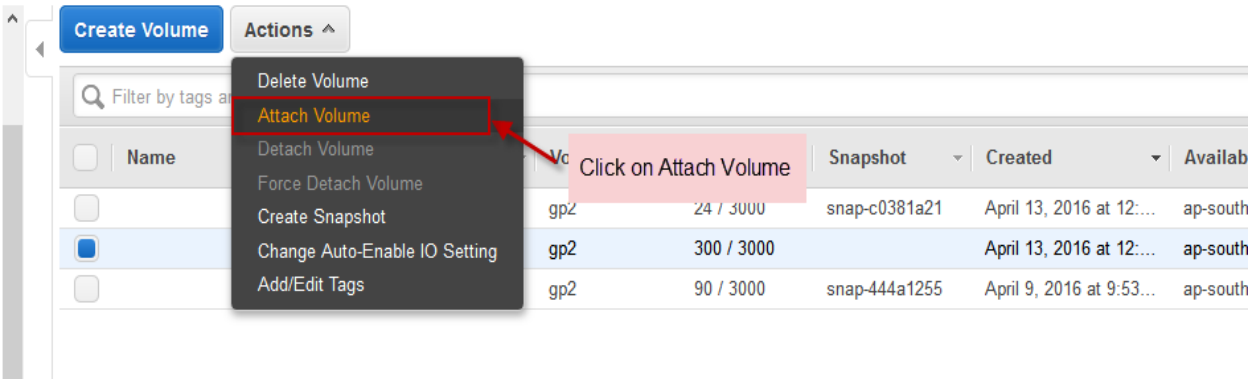


Click on Yes, Detach to confirming detaching from the Instance.

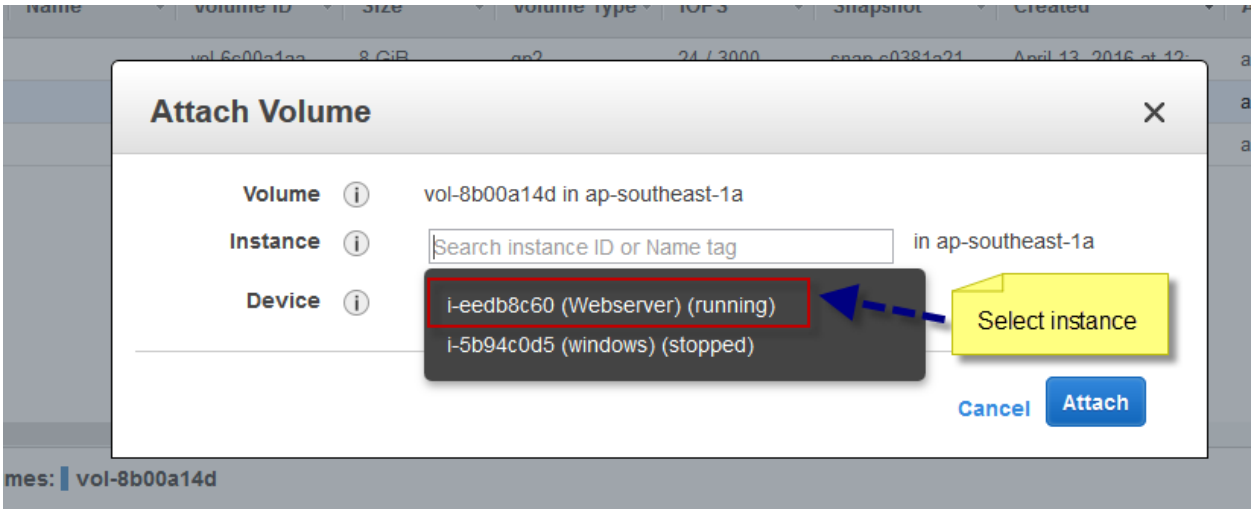


ATTACHING AND MOUNTING VOLUMES TO LINUX INSTANCES

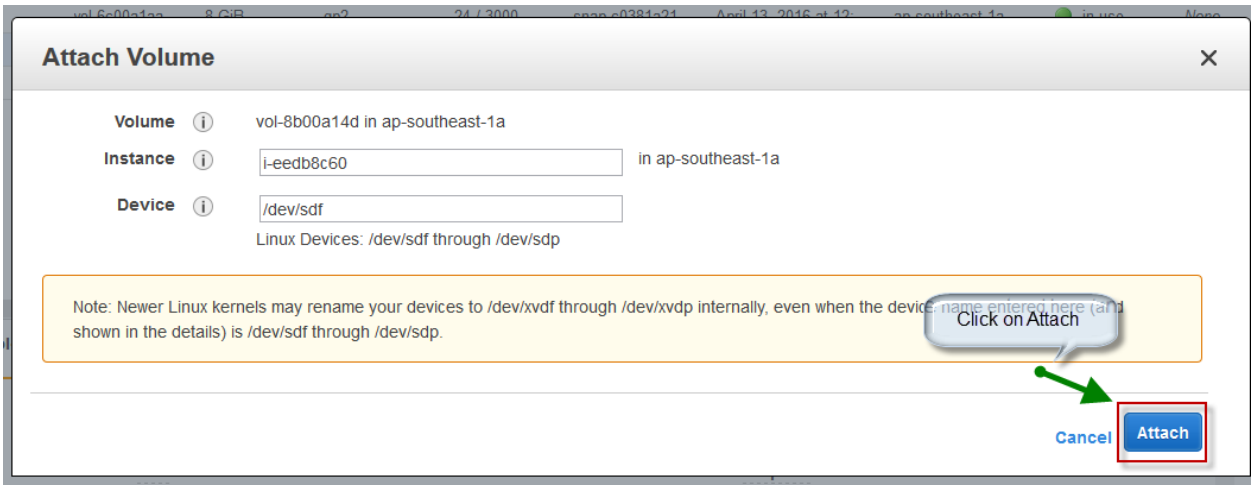
Once you logged in to AWS, go Volumes section under EC2.
Then create a volume as depicted above.
Once created select the volume and click Actions and choose Attach Volume.



Select instance from the Instance text field or specify Instance id.



Then click on Attach to attach volume to selected instance.



Then go and login to Linux and execute the below commands to format and mount to your instance.

Create the partition for newly attached volume.

```
[root@ip-172-31-25-51 ~]#fdisk /dev/xvdf
Welcome to fdisk (util-linux 2.23.2).

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
Building a new DOS disklabel with disk identifier 0x7ee209a3.

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 (2048-209715199, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-209715199, default 209715199):
Using default value 209715199
Partition 1 of type Linux and of size 100 GiB is set

Command (m for help): p

Disk /dev/xvdf: 107.4 GB, 107374182400 bytes, 209715200 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: 0x7ee209a3

    Device Boot      Start         End      Blocks   Id  System
/dev/xvdf1            2048   209715199   104856576   83  Linux

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

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

Formatting newly created partition.

```
[root@ip-172-31-25-51 ~]# mkfs.ext4 /dev/xvdf1
mke2fs 1.42.12 (29-Aug-2014)
Creating filesystem with 26214144 4k blocks and 6553600 inodes
Filesystem UUID: 6459b7c0-440f-4fc0-9422-94de2ee5dc34
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000, 7962624, 11239424, 20480000, 23887872

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

Once formatted, we are now mounting to a directory.

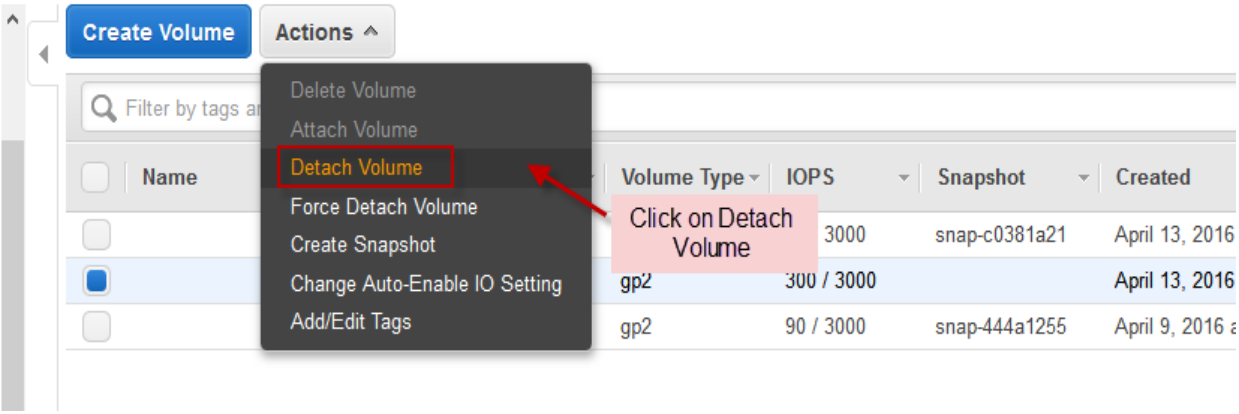
```
[root@ip-172-31-25-51 ~]# mount /dev/xvdf1 /mnt/
[root@ip-172-31-25-51 ~]#df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvda1      7.8G  1.1G  6.6G  15% /
devtmpfs        490M   64K  490M   1% /dev
tmpfs           498M     0  498M   0% /dev/shm
/dev/xvdf1       99G   60M   94G   1% /mnt
```

To unmount from the instance, follow below process.

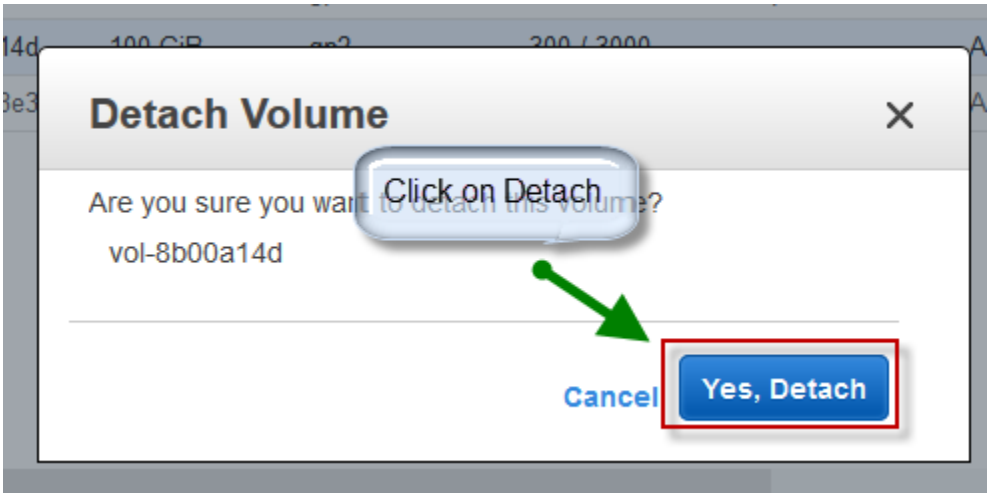
```
[root@ip-172-31-25-51 ~]#umount /mnt/

[root@ip-172-31-25-51 ~]#df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvda1      7.8G  1.1G  6.6G  15% /
devtmpfs        490M   64K  490M   1% /dev
tmpfs           498M     0  498M   0% /dev/shm
```

After unmounting, go to Volumes section, select the volume and click on Actions. Under the Actions, click on Detach Volume.



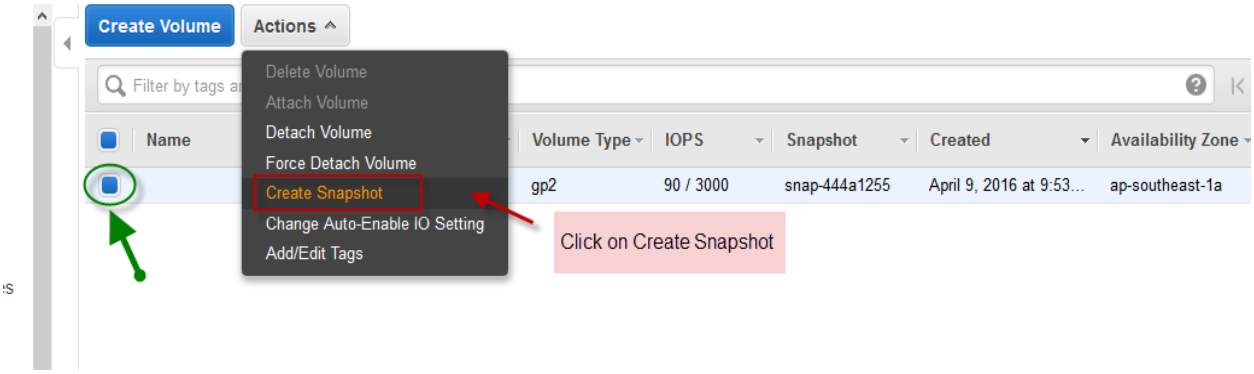
Click on Yes,Detach to detach volume.



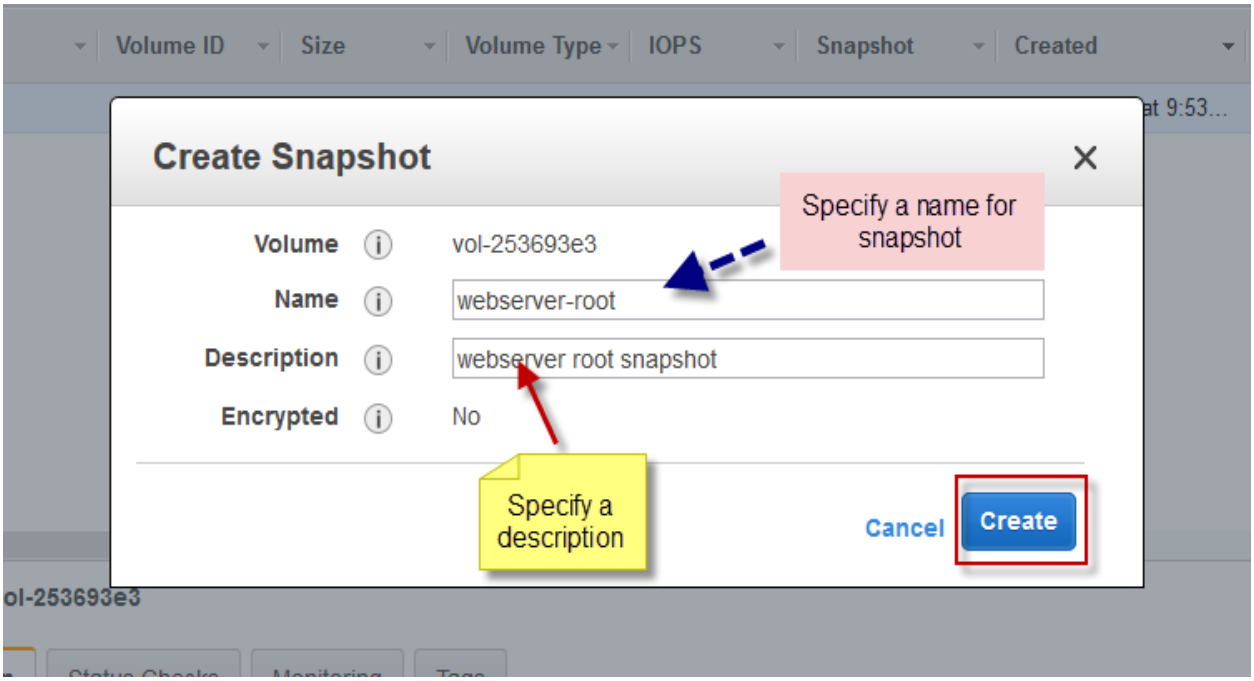
Once Volume detached, you can select and delete the volume.

CREATING AND DELETING SNAPSHOTS

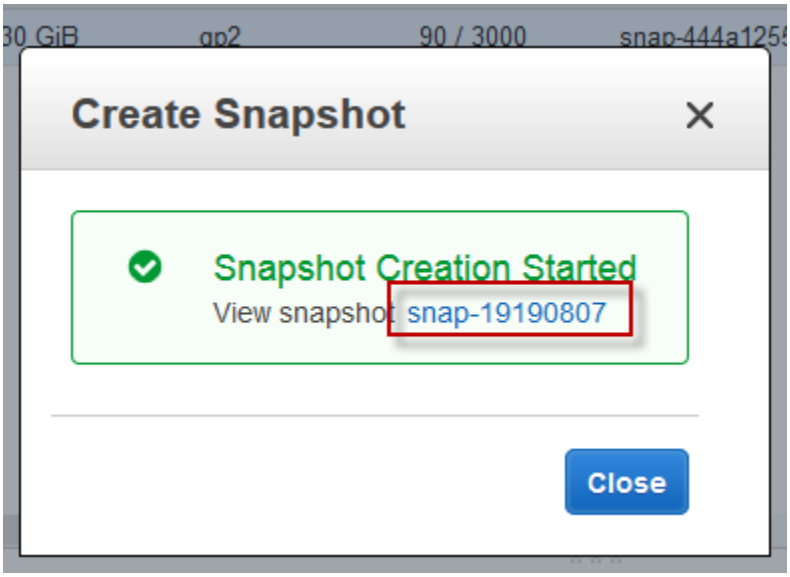
Go to Volumes section under EC2 on AWS console.
Select the volume which you want to take a snapshot and click on Actions.
Under Actions menu, select Create Snapshot.



In the next page specify name for snapshot and add description, click on Create button to create.



A confirmation box will pop up with Snapshot id.

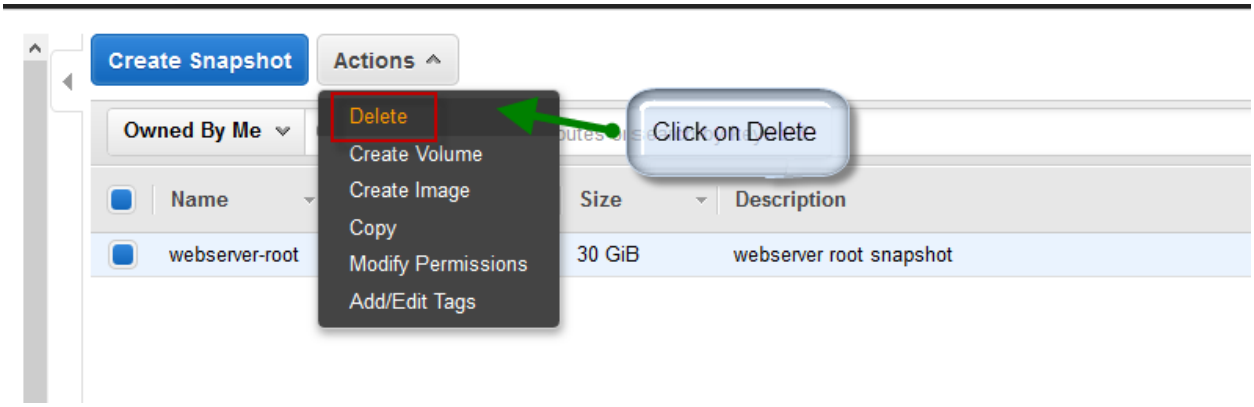


Click on the snapshot id to go the snapshot section or go to Snapshots under ELASTIC BLOCK STORE on EC2 left pane.

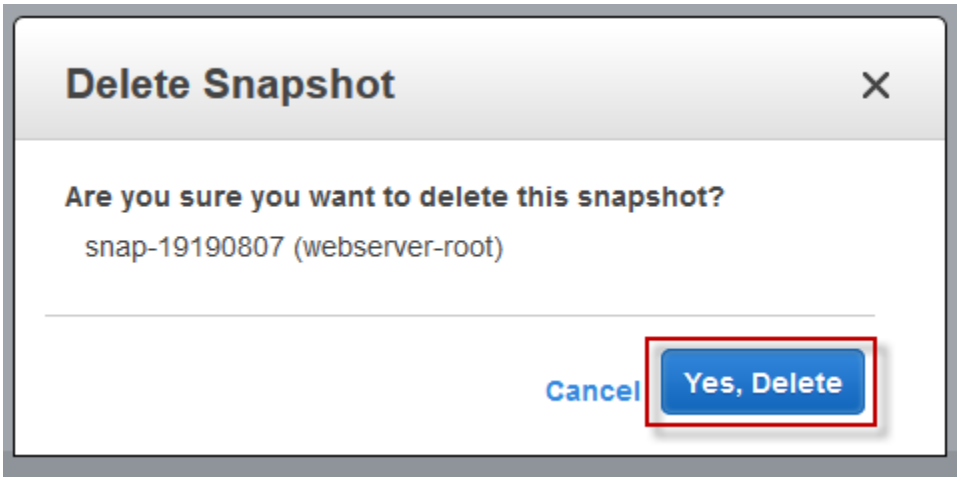
You will find your snapshot which is created.

DELETING SNAPSHOTS

Go to Snapshots section under EC2 page, then select your snapshot which you want to delete.
Click on Actions, select Delete to delete the snapshot.

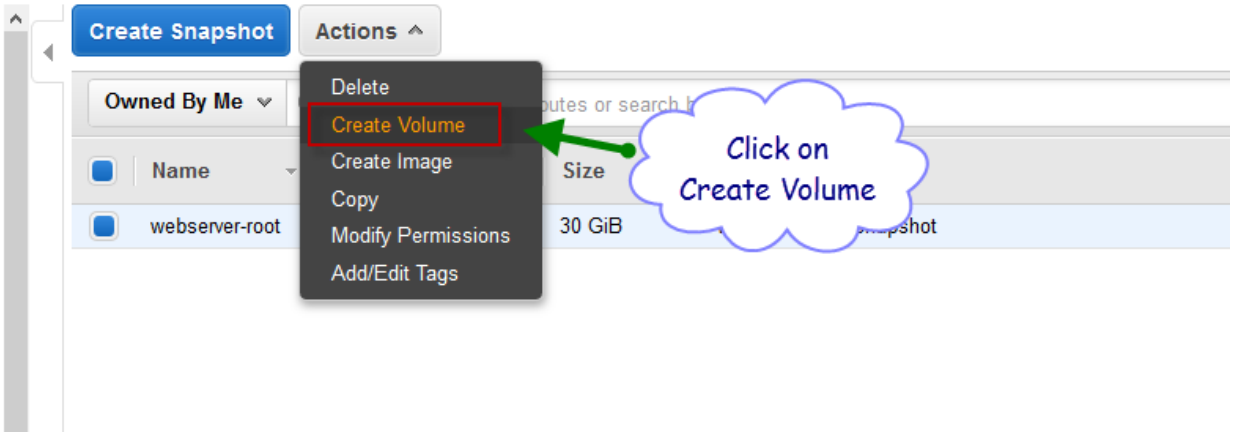


A confirmation pop up will show, click on Yes, Delete to delete the snapshot.

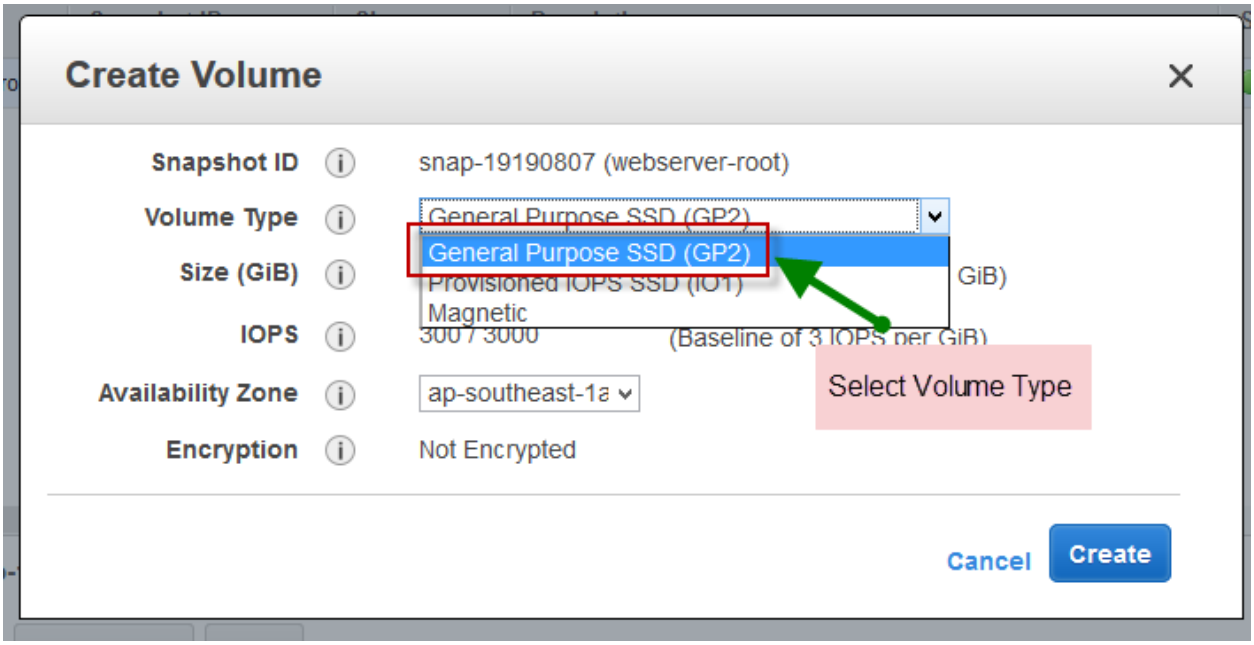


CREATING VOLUMES FROM SNAPSHOTS

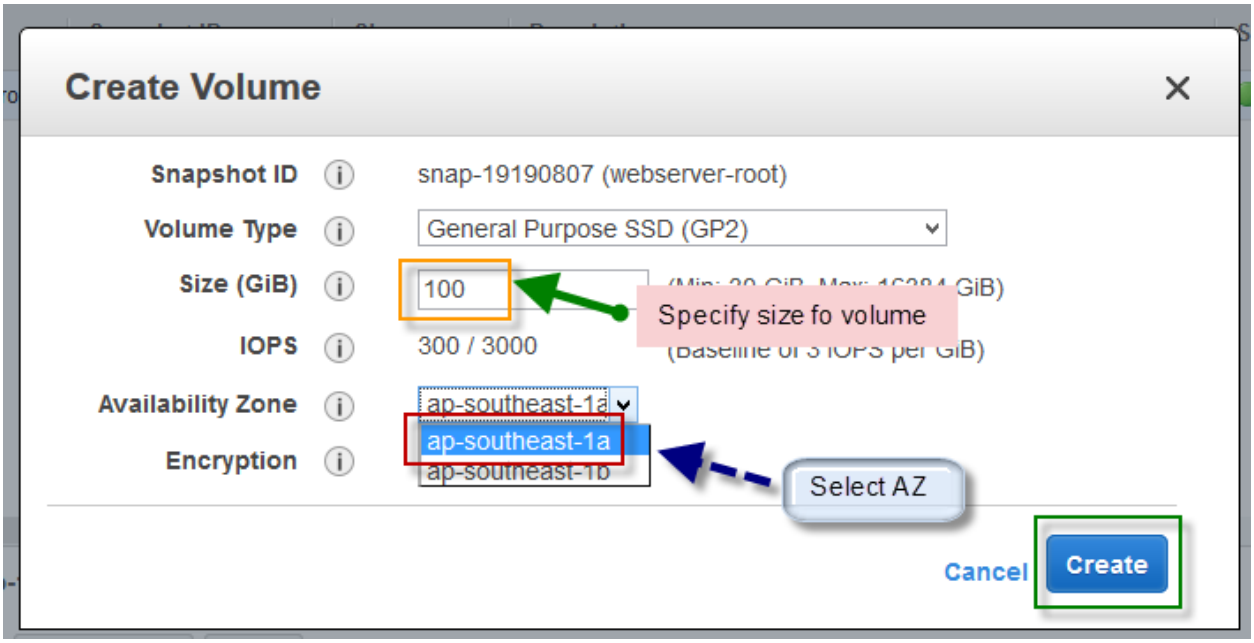
Go to Snapshots section under EC2 page.
Select the snapshot and click on Actions, then select Create Volume to create a new volume.



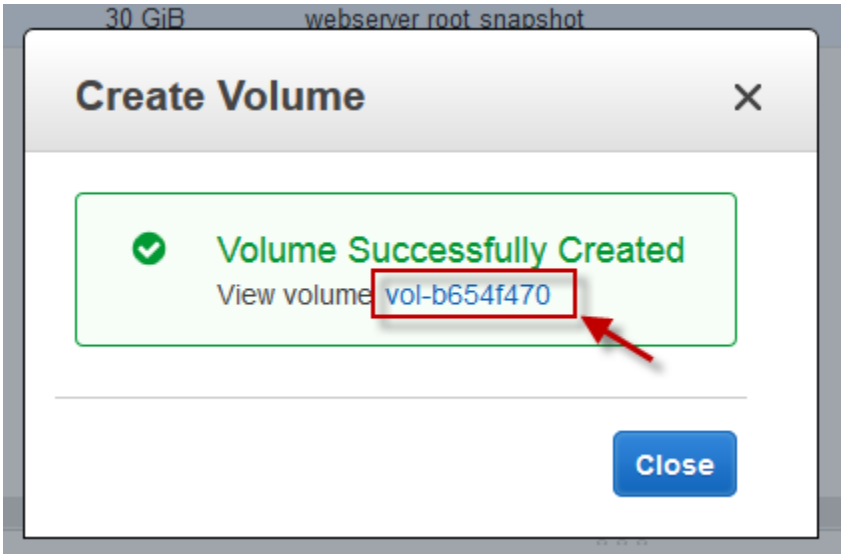
In the next page, select the Volume Type from the drop down list.



Specify size in size text field, select availability zone from drop down list. Then click on create button to create a volume.



A confirmation pop up with volume id will show, click on volume id to go to the volume.



After creation volume, you can attach to other instances.